Revised & Upgraded

Comdex®

Linux and OpenOffice Course Kit

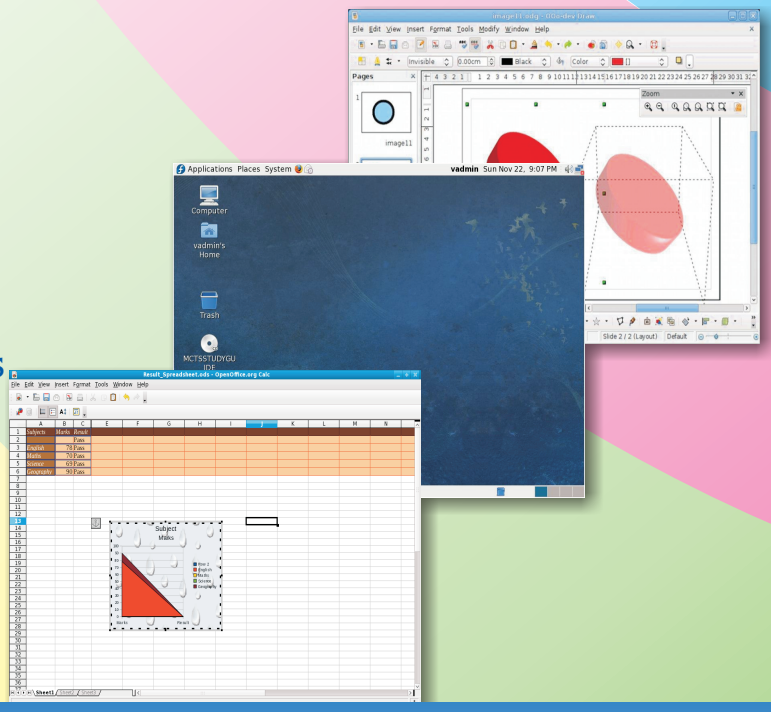
Training Kit for:

- Linux Fundamentals
- Draw
- GIMP
- Internet
- Writer
- Impress
- Calc
- Programming in Linux
- Kernel and Memory Process
- Network Administration
- Security in Linux

VIKAS GUPTA

B.E., D.P.P.S. (London), D.S.M.

Best-selling Author with Over Two Million Books sold



dreamtech PRESS

Comdex®

Linux and OpenOffice Course Kit

Vikas Gupta
B.E. (Electronics), D.P.P.S. (London), D.S.M.

Published by:

dreamtech PRESS

©copyright by Dreamtech Press, 19-A, Ansari Road, Daryaganj, New Delhi-110002.

This book may not be duplicated in any way without the express written consent of the publisher, except in the form of brief excerpts or quotations for the purposes of review. The information contained herein is for the personal use of the reader and may not be incorporated in any commercial programs, other books, databases, or any kind of software without written consent of the publisher. Making copies of this book or any portion for any purpose other than your own is a violation of copyright laws.

Limits of Liability/disclaimer of Warranty : The author and publisher have used their best efforts in preparing this book. The author make no representation or warranties with respect to the accuracy or completeness of the contents of this book, and specifically disclaim any implied warranties of merchantability or fitness of any particular purpose. There are no warranties which extend beyond the descriptions contained in this paragraph. No warranty may be created or extended by sales representatives or written sales materials. The accuracy and completeness of the information provided herein and the opinions stated herein are not guaranteed or warranted to produce any particulars results, and the advice and strategies contained herein may not be suitable for every individual. Neither Dreamtech Press nor author shall be liable for any loss of profit or any other commercial damages, including but not limited to special, incidental, consequential, or other damages.

Trademarks : All brand names and product names used in this book are trademarks, registered trademarks, or trade names of their respective holders. Dreamtech Press is not associated with any product or vendor mentioned in this book.

ISBN: 978-81-7722-928-8

ISBN: 978-93-5004-747-7 (ebk)

CD is not the part of ebook.

Preface

The Comdex Philosophy



"Give a man a fish, and he'll eat for a day. Teach him how to fish and he'll eat forever."

A Chinese proverb

The Comdex series provides a rich mix of reference books on various vocations, subjects, professions, and technologies that exist in the market today. The series is intelligently dedicated to our avid and passionate readers, predominantly acknowledging and appreciating the fact that they are on the path of making a career in the respective domains. Each book in the Comdex series is designed to ensure that in addition to gaining the requisite theoretical knowledge, the readers gain sufficient hands–on practice and practical knowhow to master the nitty–gritty of the profession. The intense treatment we give to the simplicity and elaborateness of presenting the concepts; be it IT or non–IT subject matters, has been the hallmark of the Comdex series. The Comdex series largely caters to books for varied professionals, including software, hardware, and networking professionals, financial accountants, fashion designers, DTP professionals, interior designers, customer service executives, aviation and hospitality professionals, and retail management professionals, to name a few. More than a series of books, Comdex today stands differentiated as a mission to help you **"Build Your Dream Career, the Comdex Way!"**

Introduction



Over the decades, the Open Source community has delivered world class free software, such as Fedora and OpenOffice suite. Due to user–friendly interface, powerful system administration tools, and availability of OpenOffice applications, Fedora is the most popular and widely used distribution of Linux. The Comdex Linux and Open Office Course Kit provides you in–depth knowledge about the features of Fedora environment, OpenOffice applications, and programming in Fedora. The book is designed to cater the requirements of upcoming IT professionals and students, interesting in building their career or expanding their knowledge in the Open Source technology.

Some important features to justify why the Comdex Linux and OpenOffice Course Kit book stands apart from the other books in the same series are:

- The book offers step–by–step learning approach in easy to read and understand language. In addition, ample of screen shots with visual aids are provided in the book.
- The book is divided into independent modules. You can choose sequential learning path by moving through modules or directly start your learning from an individual module.
- The book provides real–time elaborated examples and procedures which help you in mastering Open Source technologies.
- Apart from Graphical User Interface (GUI) learning, the book teaches programming skills in different programming languages under the Open Source environment.
- The 3–stage learning procedure of the book ensures that you expertise the concepts in the book by using the accompanying CD.

Distinguished Teaching Approach



The book employs a 3-Stage Self-learning System (Book + CD), which not only allows you to master theoretical concepts but also provides you with a practical learning environment in which you can create applications, evaluate your learning, and grasp upon the subject matter. The three stages of the book are:

Explanation Stage: This is the first stage of your learning where you are required to read the book to understand all the essential concepts about a subject. Once the basic know-how of the subject is clear, you can switch over to the next stage of learning.

Audio-Video Demo Stage: This is the second stage of your learning where you insert the accompanying CD in your computer and click on the topic you want to learn. The customized software automatically teaches you step-by-step through audio-video and graphic simulations. You do not have to do anything—just sit back and watch.

Self-Testing/Practice Stage: This is the final stage of your learning curve where the self-testing software allows you to test your skills by practicing what you have learned. You can seek help by reading the instructions; else it would point out your mistakes, show you the correct step, and encourage you to try again.

What is so unique about this book?

Chapter Preview: Helps you to gain an insight of the content in each chapter before you actually start reading the chapter.

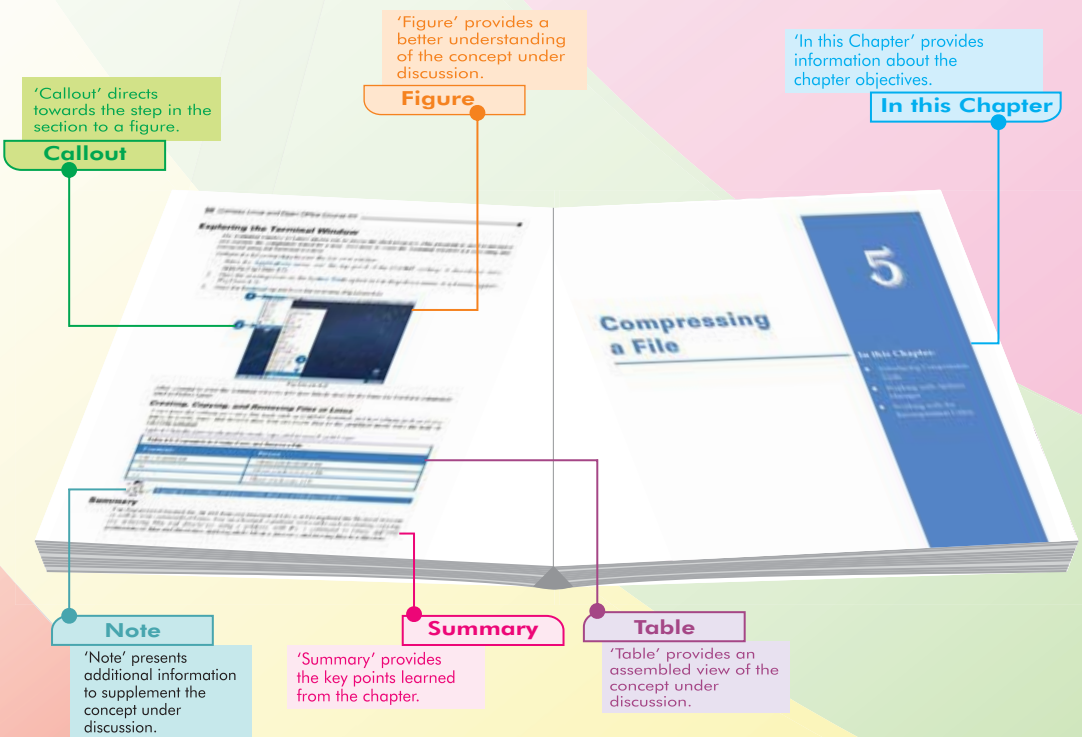
Notes: Convey additional information and relevant perspectives.

Procedures: Describe the sequence of performing a task in a step–by–step and easy to understand manner, with relevant figures.

Figures Supplementing the Descriptions: Help to understand the concepts better.

Callouts: Serve as pointers to the location at which an action is being performed in the figure. The callouts mostly correspond to the tasks performed in steps.

Self-Learning Tutorial CD: : Helps you to learn, practice, explore, experiment, and master different Open Source applications.



The Book at a Glance

The book comprises 9 individual modules, each fulfilling requirements to master a specific Open Source technology and ensuring easy to learn path in an effective manner. Modules covered in the book are Linux, DRAW, GIMP, Internet, OpenOffice.org Writer, OpenOffice.org Calc, OpenOffice.org Impress, Programming in Linux, and Advance topics. Let's discuss each module and key points included in it.



BASICS OF LINUX

Module 1 of the book introduces you with the fundamentals of Linux and system management through various tools and applications available in the Linux environment. Chapters under this module acquaint you with the basics as well as features of Linux and GUI environments (Fedora and K Desktop Environment). While reading chapters of this module you learn to perform basic tasks, such as managing files using the Nautilus file manager, playing audio–video files, games, setting file permissions, writing data on CD, and managing packages through Red Hat Package Manager (RPM).



DRAW

Module 2 of the book introduces the DRAW applications. You can use the DRAW application to draw and edit basic images in a user–friendly manner. Besides drawing and editing images, you can also add effects to images and set properties of different objects using Draw.



GIMP

Module 3 of the book explores the GIMP application. The GIMP application comprises various image editing tools and allows you to perform advance level of image editing, such as working with layers, modifying the selected area in an image, transforming an image into different types of shapes, and applying different visual effects.



INTERNET

Module 4 of the book introduces you with Internet surfing through the Firefox Mozilla browser. Apart from Internet surfing, the module familiarizes you with search engines, email, Internet Relay Chat and blogs. The module also teaches you to set up different types of connections by using modem and broadband.



WRITER

Module 5 of the book familiarizes you with the word processing program of Open Office suite, Writer. The user–friendly interface of Writer lets you create professional looking documents with ease. The powerful formatting and editing tools of Writer allow you to create simple and complex documents with minimum effort.



IMPRESS

Module 6 acquaints you with the Impress program of Open Office Suite. The Impress program helps you to enhance the clarity of your presentation with the help of some built–in features, such as special effects, animation, and drawing tools. Impress allows you to create slides that can contain different elements, including text, bulleted and numbered lists, tables, charts, clip art, and a wide array of graphic objects.



CALC

Module 7 of the book introduces you with the spreadsheet program of Open Office suite, Calc. The Calc application has various built–in functions, which help you to perform mathematical and financial calculations. Moreover, the Calc application allows you to format worksheets and create different types of charts to display data in form of graphic for quick understanding.



PROGRAMMING IN LINUX

Module 8 introduces programming in Linux. The module comprises HTML, Shell, and C programming techniques. In this module, you learn the basics of HTML programming and some basic concepts, such as Web browser, Web server, and HTML editors. The Shell programming chapter of the module enables you to develop and execute programs using Shell commands. Besides HTML and Shell programming, you also explore the basic concepts used in C programming, such as constants, variables, data types, and operators. You also learn to create, save, compile, and execute a C program.



ADVANCE TOPICS

Module 9 explores the advance topics of Linux. In this module, you learn about the architecture and data structure of the Linux kernel, different modules of kernel, and memory and process management. The module also familiarizes you with network administration and tasks related to it, such as configuring the LAN card, Dynamic Host Configuration Protocol (DHCP) and the Domain Naming Services (DNS) server. The module also discusses the Samba File server, the File Transfer Protocol (FTP) server, and the Telnet server. Through module 9, you learn how to change the password of general user as well as the root user and monitor the log files. Further, you become familiar with the SSH tool and its commands.

Contents at a Glance

BASICS OF LINUX

1. Getting Started with Linux 1
2. Working with K Desktop Environment 19
3. Working with the GNOME Desktop Environment 27
4. Working with Files and Directories 47
5. Compressing a File 89
6. Working with Applications 101
7. Gaming in Linux 133
8. Introducing Educational Tools in Linux 145
9. Working with Users and User Accounts 163

DRAW

1. Creating and Modifying Objects Using Draw 175

GIMP

1. Introducing GIMP 201
2. Working with Tools 225
3. Working with Layers and Text 253

INTERNET

1. Internet and Linux-Based Mozilla Firefox 271

WRITER

1. Getting Started with OpenOffice.org Writer 305
2. Editing Documents in Writer 311
3. Formatting the Document 331

IMPRESS

1. Getting Started with OpenOffice.org Impress 361
2. Working with Presentations 377

CALC

1. Getting Started with OpenOffice.org Calc 417
2. Working with Functions and Operators 433
3. Working with the OpenOffice.org Calc Layout 457

PROGRAMMING IN LINUX

1. Introduction to HTML 515
2. Linux Shell Programming 541
3. Introduction to C Programming 557
4. Working with Control Structures 571
5. Working with Arrays and Functions 583

ADVANCE TOPICS

1. Introducing Linux Kernel and Memory Process 595
2. Introducing Network Administration in Linux 603
3. Introducing Security in Linux 637

APPENDIX

1. Virtualization in Linux 647

Table of Contents

Preface iii

BASICS OF LINUX

1. Getting Started with Linux 1
Introducing Linux 2
Exploring the History of Linux 2
Using Linux in the Real World 3
Exploring Features of Linux 3
Exploring Linux Distributions 3
Ubuntu 3
Debian 4
Gentoo 4
KNOPPIX 4
SUSE and openSUSE 4
Yellow Dog Linux 4
Slackware 4
Mandriva 4
Freespire and Xandros 4
Fedora 5
Exploring Fedora Linux 5
Exploring the Features of Fedora Linux 5
Deploying Fedora Linux 5
Exploring Hardware Requirements to Install Fedora Linux 5
Installing Fedora Linux 6
Using GRUB and LILO Boot Loaders 11
Introducing the Fedora Desktop 14
K Desktop Environment 14
GNOME Desktop Environment 14
X and a Window Manager 14
Starting the Desktop 14
Booting Right to the Desktop 15
Booting up to the Graphical Login Screen 15
Booting up to the Text Prompt 15
Getting Help on Linux 15
Shutting Down Linux 17
Summary 18

2. Working with K Desktop Environment 19
Exploring K Desktop Environment 20
Organizing your KDE 21
Arranging Desktop Icons 21
Pinning Windows on the Top/Bottom of Desktop 21
Adding Widgets to the Panel and Desktop 22
Working with Dolphin and Konqueror File Managers 24
Managing Files with Dolphin File Manager 24
Managing Files with Konqueror File Manager 25
Summary 26

3. Working with the GNOME Desktop Environment 27
Exploring the GNOME Desktop Environment 28
Opening a Window 28
Exploring the Components of a Window 29
Opening Multiple Windows on the Desktop 29
Closing a Window 30
Moving and Resizing a Window 31
Maximizing a Window 31
Restoring a Window to its Original Size 32
Minimizing a Window 32
Resizing a Window Manually 33
Moving a Window 33
Toggling between the Open Windows 34
Viewing the Linux Accessories 35
Working with Different Workspaces 36
Adding a New Workspace 36
Toggling between Workspaces 37
Working with the GNOME Panel 38
Creating a GNOME Panel 38
Changing the Position of the GNOME Panel 38
Adding an Object to the Top GNOME Panel 39
Removing an Object from the GNOME Panel 40
Adding a Drawer to the Panel 41
Deleting a GNOME Panel 45
Summary 46

4. Working with Files and Directories 47
Introducing Linux Files and Directory Structure 48
Exploring the Terminal Window 49
Describing the Basic Linux Commands 50

Working with Files in Linux 50
Creating, Copying, and Removing Files in Linux 51
Using Wildcards with ls command 53
Describing the Linux File Permission 54
Working with Directories in Linux 55
Creating and Removing a Directory in Linux 56
Applying Permissions on a Directory 57
Setting a Group ID (SGID)on a Directory 57
Applying a Sticking Bit on a Directory 58
Applying the Umask Settings 59
Moving Files to a Directory 59
Backing up and Restoring Files 60
Working with Nautilus File Manager 66
Creating a New Folder 66
Renaming a Folder 67
Copying Files into a Folder 67
Moving Files and Directories 68
Creating a Link for a File or a Directory 69
Opening a File 71
Opening a File with an Application 71
Displaying the Properties of a File 72
Viewing the Permissions of a File 73
Deleting a File 73
Deleting a File Permanently 74
Introducing Emblems 75
Setting the Permissions for a File by Using the Nautilus File Manager Window 76
Working with Storage Media 78
Checking the Hard Disk Space by using the df Command 78
Exporting Data to Removable Media 79
Viewing the List of Filesystems Mounted On the Linux System 81
Mounting and Burning a DVD-RW Drive 81
Accessing a CD/DVD 85
Burning a CD 86
Summary 88

5. Compressing a File 89
Introducing Compression Tools 90
Archive Manager (File Roller) 90
Recompression Utility 90
Working with Archive Manager 90
Backing up a File in a Compressed Form 91
Adding Files and Folders to an Archive File 92
Extracting Files from an Archive 94
Closing Archive Manager 96
Working with the Recompression Utility 96
Using the advzip Utility 97
Using the advpng Utility 98
Using the advmng Utility 99
Summary 100

6. Working with Applications 101
Opening a Text Editor 102
Creating a Document 102
Saving the Document 104
Closing the Document 105
Quitting the Text Editor 106
Opening and Modifying an Existing Document 106
Working with Packages 109
Installing and Uninstalling a Package Using the Add/Remove Software Application 109
Exploring Different Red Hat Package Manager (RPM) Packages 112
Installing an RPM Package 114
Uninstalling an RPM Package 114
Opening a PDF File using Adobe Acrobat 115
Working with Music and Video 116
Managing Sound Controls 116
Exploring Sound Juicer 117
Exploring Totem Movie Player 122
Exploring Rhythmbox Music Player 128
Summary 132

7. Gaming in Linux 133
Introducing Hardware Requirements for Linux Gaming 134
Exploring Linux Games in GNOME and KDE Desktop 134
Exploring Linux Games in GNOME Desktop 134
Exploring Linux Games in KDE Desktop 135
Starting a GNOME Linux Game 137
Playing Nibbles 137
Playing Mahjongg 138
Starting a KDE Linux Game 141
Introducing Commercial Game in Linux 143
Playing Game Using Cedega 6.0 143
Summary 144

8. Introducing Educational Tools in Linux 145
Exploring a Suite of Educational Tools 146
Education Suite for Kids 2-10 Years Old 146
Interactive Educational Geometry in Linux 149

Introducing Dictionary 153
Speeding up with Typing Tutorials 154
Using GNU Typing 155
Using Tux Typing 158
Introducing OpenGL Globe-Earth Simulation for Linux 160
Introducing Desktop Planetarium 161
Summary 162

9. Working with Users and User Accounts 163
Managing User Accounts 164
Adding User Accounts 164
Displaying User Accounts 167
Changing the User Account Properties 167
Deleting User Accounts 168
Managing Groups 169
Creating New Groups 169
Adding User Accounts to Groups 170
Setting File Permissions for Groups 171
Summary 174

DRAW

1. Creating and Modifying Objects Using Draw 175
Opening OpenOffice.org Draw 176
Working with Objects 177
Creating an Object 177
Selecting an Object 178
Changing the Outline 178
Changing the Fill Properties of an Object 180
Working with Slides 183
Inserting a New Slide 183
Adding Text in a Slide 183
Changing the Text Properties 184
Switching Between Slides 186
Saving the Draw Document 186
Modifying Objects 187
Rotating an Object 187
Aligning the Objects 194
Working on a Group 196
Grouping Objects 196
Moving a Group 197
Merging and Combining Objects 197
Quitting the Application 199
Summary 200

GIMP

1. Introducing GIMP 201
Exploring the Features of GIMP 202
Getting Started with GIMP 202
Exploring the Interface of GIMP 203
Opening a New File 204
Working with Images 206
Opening an Image File 206
Copying an Image 207
Closing an Image 208
Editing Images 209
Undoing Changes in an Image 212
Working with Colors 213
Exploring Color Modes 214
Setting Foreground and Background Colors 215
Capturing Pictures by Using GIMP 216
Capturing an Entire Screen 217
Capturing an Active Window 219
Saving a File 222
Closing a File and Quitting GIMP 223
Summary 224

2. Working with Tools 225
Working with the Selection Tools 226
Using Rectangle Select Tool 226
Using Free Select Tool 229
Using Fuzzy Select Tool 230
Using Scissors Select Tool 230
Working with a Selection 232
Moving a Selected Portion 232
Editing a Selection 233
Copying a Selection 234
Inverting a Selection 235
Erasing a Selection 235
Filling a Selection 236
Working with Painting Tools 237
Using Paintbrush Tool 238
Using Pencil Tool 239
Working with Editing Tools 240
Using Blur Tool 241
Using Sharpen Tool 242
Using Smudge Tool 242
Using Clone Tool 243
Using Dodge /Burn Tool 244
Transforming Images 246
Rotating an Image or a Selection 246
Scaling an Image or Selection 247

Distorting an Image or a Selection 249
Using Flip Tool 250
Quitting GIMP 251
Summary 252

3. Working with Layers and Text 253
Exploring the Layers Dialog Box 254
Creating a Layer 257
Using the Create New Layer Button 257
Copying a Part of Another Image 258
Working with a Layer 260
Selecting a Layer 260
Moving the Layer 261
Renaming the Layer 262
Hiding/Showing the Layer 263
Reordering the Layer 263
Merging Layers 264
Deleting the Layer 265
Working with the Text 265
Loading a Text File in an Image 267
Quitting the GIMP Application 270
Summary 270

INTERNET

1. Internet and Linux-Based Mozilla Firefox 271
Understanding the Internet Connection 274
Accessing to the Internet 274
Creating a Shortcut to the Network Configuration window 278
Exploring the Features of Mozilla Firefox 280
Launching Mozilla Firefox 280
Understanding the Interface of Mozilla Firefox 281
Browsing the Internet with Mozilla Firefox 281
Downloading a Game from the Internet 282
Setting Preferences in Mozilla Firefox 283
Viewing the History of Visited Websites 286
Using a Search Engine 286
Creating a Blog 287
Introducing Electronic Mail (E-Mail) 291
Advantages of E-mail 291
Structure of an E-mail 291
E-mail Clients 292
Working with an E-Mail Account 292
Creating an E-Mail Account 292
Logging in to an E-mail Account 294
Working with an E-Mail Message 295
Composing a Reply to an E-Mail Message 295
Sending an E-Mail Message 296
Printing an E-Mail Message 297
Deleting an E-mail Message 298
Signing Out of an E-mail Account 298
Quitting Mozilla Firefox 299
Introducing Internet Relay Chat 299
Disconnecting from the Internet 303
Summary 303

WRITER

1. Getting Started with OpenOffice.org Writer 305
Opening OpenOffice.org Writer 306
Exploring the OpenOffice.org Writer Interface 307
Working with a Document 307
Saving a Document 308
Closing a Document 309
Exiting OpenOffice.org Writer 310
Summary 310

2. Editing Documents in Writer 311
Opening an Existing OpenOffice.org Writer Document 312
Exploring Selection Modes 313
Making Changes to a Document 313
Selecting the Text 313
Copying and Pasting the Text 314
Moving the Text 315
Deleting the Text 316
Undoing a Task 316
Redoing a Task 317
Exploring the Find and Replace Feature of OpenOffice.org Writer 318
Finding All Occurrences of the Word 319
Replacing the Text 320
Exploring the AutoCorrect Context Menu 321
Working with Word Completion Features 321
Accepting a Suggestion 322
Rejecting a Suggestion 323
Customizing the Word Completion Tab 323
Working with Spelling and Grammar Checker 324
Turning the AutoSpellcheck Utility On 324
Starting the Spellcheck 325
Inserting Hyperlinks in Text 326
Merging Documents 328
Saving Changes Made to a Document 329
Summary 330

3. Formatting the Document 331
Setting the Page margins 332
Describing Headers and Footers 333
Adding a Header 333
Adding a Footer 334
Working with a Table 334
Inserting a Row in the Table 335
Inserting a Column in the Table 336
Deleting a Row from the Table 337
Deleting a Column from the Table 339
Formatting Text in a Document 339
Working with the Font of the Text 340
Highlighting the Text 341
Aligning the Text 341
Applying Bullets and Numbers to Text 341
Working with Graphics 342
Adding Graphics to a Document 342
Modifying the Graphic 343
Moving the Graphic 346
Wrapping the Text around Graphic 346
Working with Templates 347
Generating Templates 348
Designing Documents using Template 351
Navigating the Document 353
Applying Styles 354
Previewing the Document 355
Printing a Document 356
Taking a Printout 357
Adding a Printer 357
Summary 360

IMPRESS

1. Getting Started with OpenOffice.org Impress 361
Starting OpenOffice.org Impress 362
Exploring the Impress Interface 363
Inserting a New Slide 368
Inserting Text in a Slide 369
Saving a Presentation 371
Creating a Presentation Using Templates 372
Closing the OpenOffice.org Impress Presentation and Quitting the Impress 375
Summary 376

2. Working with Presentations 377
Opening an Existing Presentation 378
Formatting the Text 379
Changing the Font Style 379
Changing the Font Size 380
Changing the Font color 381
Inserting the Bulleted List 382
Working with Text Effects 384
Creating a Fontwork Object 384
Editing the Fontwork Object 386
Using Fontwork Toolbar 387
Moving and Resizing the Fontwork Object 388
Inserting Objects in a Slide 389
Inserting an OLE Object 390
Inserting a Picture 392
Inserting a Chart 394
Applying the Slide Animation Effect 395
Removing the Slide Animation Effects 400
Applying the Slide Transition Effect 402
Modifying a Slide Transition 403
Introducing Advance Slide 405
Removing the Slide Transition Effect 407
Running a Slide Show 409
Setting Options for a Slide Show 409
Moving and Deleting the Slides 411
Moving the Slides 411
Deleting the Slide 412
Saving the Existing Presentation 414
Printing the Presentation 414
Summary 416

CALC

1. Getting Started with OpenOffice.org Calc 417
Starting OpenOffice.org Calc 418
Exploring the OpenOffice.org Calc Interface 419
Entering Data in a Cell 420
Entering a Label (Text) 420
Entering a Value/ Number 421
Defining Ways to Select Cells 423
Exploring Continuous Selection 423
Exploring Non-Continuous Selection 423
Making Changes to Data 424
Deleting the Data 424
Replacing the Data 425
Undoing the Last Changes 426
Saving the Spreadsheet 427
Closing the Spreadsheet and Quitting the OpenOffice.org Calc 431
Summary 432

2. Working with Functions and Operators 433
Using a Cell Range 434
Working with the Date() and Time() Functions 434
Using the Date() Function 434
Using the Now() Function 436
Using the Time() Function 437
Exploring the Logical Functions 438
Working with the Mathematical Functions 439
The SUM() Function 439
The COUNTBLANK() Function 441
The ABS() Function 442
Working with the Text Functions 443
The CONCATENATE() Function 443
The EXACT() Function 444
The FIND() Function 445
The REPLACE()Function 447
Working with the Spreadsheet Functions 448
The ADDRESS() Function 448
The COLUMN() Function 450
The ROW() Function 451
Applying a Function Automatically to Other Cells 452
Working with Operators 454
The Arithmetical Operators 454
The Comparative Operators 455
The Text Operator 455
The Reference Operators 455
Introducing Relative Cell Addressing 456
Introducing Absolute Cell Addressing 456
Summary 456

3. Working with the OpenOffice.org Calc Layout 457
Opening an Existing OpenOffice.org Calc Spreadsheet 459
Inserting a New Spreadsheet 461
Copying the Content of a Spreadsheet 462
Moving the Data 464
Moving the Spreadsheet 467
Renaming the Spreadsheet 468
Deleting a Spreadsheet 469
Working with Rows and Columns 470
Inserting a Row 470
Inserting a Column 472
Deleting a Row 473
Deleting a Column 475
Deleting the Content of a Row 477
Deleting the content of a Column 479
Undoing an Action 481
Inserting a Series 482
Changing the Column Width 485
Hiding a Column 486
Changing the Row Height 487
Aligning the Data 489
Formatting the Data 491
Changing the Font 491
Changing the Font Size 492
Changing the Font Style 494
Applying Font Effects 495
Applying the Outline Effect 496
Applying the Shadow Effect 497
Applying a border to a Cell 498
Exploring the AutoFormat Feature 500
Working with Graphs 502
Moving the Graph 504
Changing the Appearance of the Graph 505
Sorting the Data in a Spreadsheet 507
Setting the AutoSave Feature 509
Protecting a Spreadsheet 511
Saving the Changes Made to a Spreadsheet 512
Printing the Spreadsheet 513
Summary 514

PROGRAMMING IN LINUX

1. Introduction to HTML 515
Exploring Web Browser 516
Exploring the Web Server 516
Exploring HTML Editors 516
Understanding HTML Document Structure 517
Declaring Document Type 517
Exploring HTML Tags 517
Exploring Document Header 517
Exploring Document Title 518
Body of HTML Document 518
Exploring Meta Data 518
Creating Your First HTML Document 518
Saving the HTML Document 520
Previewing the HTML Document 521
Creating Paragraphs 523
Adding Line Breaks 524
Creating Numbered Lists 526
Inserting an Image to the Web Page 527
Adding a Table 528
Working with Hyperlinks 531
Creating a Link to Open another Web Page 531
Creating a Link to an E-mail Address 533

Using Image as a Link 535
Creating a Frame 537
Summary 540

2. Linux Shell Programming 541
Exploring the Linux Shell 542
Describing Types of Shells in Linux 542
The C Shell (csh) 542
The TC Shell (tcsh) 543
The Korn Shell (ksh) 543
The Bash Shell 543
Using Shells in Linux 543
Locating Commands 543
Rerunning Commands 544
Connecting and Expanding Commands 544
Exploring Shell Syntax 545
Variables 545
Conditions 546
Functions 547
Input and Output 547
Commands 547
Command Execution 548
Creating Shell Environment 548
Setting Shell Prompt 548
Configuring a Shell 549
Adding Environment Variables 549
Setting Environment Variables 550
Adding Aliases 550
Working with Text Editors 550
Using the gedit Text Editor 551
Using the Vim Text Editor 551
Summary 556

3. Introduction to C Programming 557
Exploring the Features of C Programming 558
Exploring the Concepts used in C Programming 558
Constants and Variables 558
Keywords and Identifiers 560
Data Types 560
Comments 561
The printf() and the scanf() function 561
Writing the First C Programming 562
Compiling and Executing a C Program in Linux 564
Exploring C Operators 565
Arithmetic Operators 565
Logical Operators 566
Relational Operators 567
Assignment Operators 567
Conditional Operators 568
Increment/Decrement Operators 569
Bitwise Operators 569
Operators Precedence 570
Summary 570

4. Working with Control Structures 571
Working with Decision Control Structure 572
The if Statement 572
The if-else Statement 573
The if-else Ladder 574
The Nested if-else Statement 574
The switch Statement 575
Working with Looping Control Structure 577
The while Loop 577
The do-while Loop 578
The for Loop 578
Using Jump Statements 580
The break Statement 580
The continue Statement 581
The goto Statement 581
Summary 582

5. Working with Arrays and Functions 583
Exploring Types of Array 584
One-Dimensional Arrays 584
Two-Dimensional Arrays 586
Working with Functions 589
Exploring the Types of Function 589
Declaring a Function 589
Defining a Function 590
Calling a Function 590
Understanding Argument and Parameters 591
Exploring Scope of Variables 591
Passing Parameter Methods 592
Using the Recursive Function 594
Summary 594

ADVANCE TOPICS

1. Introducing Linux Kernel and Memory Process 595
Exploring the Functions of Linux Kernel 596
Describing the Architecture of the Linux Kernel 597
Describing the Kernel Data Structure 598

Linked Lists 598
Hash Tables 598
Abstract Interfaces 598
Introducing Kernel Modules 598
Describing Kernel Modules Utility 599
Loading and Unloading a Kernel Module 599
Setting Up the Run Levels 599
Managing Memory 600
Using the Top Command 600
Using the Vmstat Command 601
Using the Free Command 601
Understanding the Demand Paging Technique 601
Linux Page Caching 601
Managing Processes 602
Process Scheduling 602
Virtual Memory 602
Summary 602

2. Introducing Network Administration in Linux 603
Managing Network in Fedora 11 604
Understanding the TCP/IP Network Model 604
The Physical Layer 605
The Data-Link Layer 605
The Network Layer 605
The Transport Layer 606
The Application Layer 606
Ethernet LAN 607
Standard Ethernet 607
Fast Ethernet 607
Gigabit Ethernet 608
Working of Ethernet LAN 608
LAN Card Configuration 608
Exploring the IP Address 611
Classification of IP Addresses 611
Class A 612
Class B 612
Class C 612
Class D 612
Class E 612
Working with the Dynamic Host Control Protocol (DHCP) Server 613
Installing the DHCP Server 613
Configuring and Assigning an IP Address at the Client Machine in DHCP Server 614
Working with the Domain Naming Services (DNS) Server 615
Name Space 616
Domain Name Space 616
Configuring the DNS Server 616
Working with the Samba File Server 618
Sharing Files with the Samba File Server 618
Accessing Samba Share from Windows Vista 620
Working with the FTP Server 621
Installing the FTP Server 621
Configuring the FTP Server 622
Accessing the FTP Server with a Client Computer 623
Introducing Telnet Server 625
Installing and Accessing the Telnet Server 625
Accessing the Client Computer with Telnet 626
Web Server 627
Installing the Apache Web Server 627
Hosting a Web page through the Apache Web Server 628
Introducing the SQUID Proxy Configuration 631
Assigning a Proxy on the Client Machine 633
Introducing Mail Server in Fedora Linux 636
Introducing qmail server 636
Introducing Cyrus-imapd Server 636
Summary 636

3. Introducing Security in Linux 637
Exploring Security Checklist in Linux 638
Exploring Password Protection 638
Changing General User's Password 639
Changing Root User's Password 641
Monitoring Log Files 643
Understanding Secure Shell Tools in Fedora 644
Using the chkconfig Command to Start the SSH Service 644
Exploring the ssh, sftp, and scp Commands 646
Exploring Security Enhanced Linux (SELinux) 646
Summary 646

APPENDIX

1. Virtualization in Linux 647
Describing Virtualization in Linux Fedora 648
Creating a Virtual Machine 652
Accessing a Virtual Machine 654

BASICS OF LINUX

CHAPTER

1

Getting Started with Linux

In this Chapter:

- Introducing Linux
- Exploring Linux Distributions
- Exploring Fedora Linux
- Exploring the Features of Fedora Linux
- Deploying Fedora Linux
- Introducing the Fedora Desktop
- Starting the Desktop
- Getting Help on Linux
- Shutting Down Linux

Linux is a UNIX-based operating system created by Linus Torvalds, a software programmer. It is a freely distributable and open source operating system. Open source refers to a program whose source code is freely available on the Internet. This source code is open to modification by anyone who uses it. UNIX, Linux, and GNU are three operating systems based on an open-source code. UNIX is a multiuser and multitasking operating system, which was developed by AT & T at Bell Laboratories in 1969. It is purely governed by The Open Group, which conforms to the Single UNIX Specification. This specification defines the names of the interfaces and behaviors of all the mandatory functions, such as memory locking, priority scheduling, and shared memory. A user can modify these originally created source code as per the requirement without seeking permission from its creator. The only limitation of freely available source code is that the changes that are made in the original source code are to be redistributed over the Internet. The Linux operating system can be installed on any computer having x86-compatible microprocessors.

Microsoft licenses can be installed only on a single computer; whereas, a Linux distribution can be installed on any number of computers, free of cost.

The significant features of Linux are that its applications are portable and fully downloadable, and there are no hidden settings in its source code or registries. The Linux operating system is robust as compared to other operating systems because a Linux installed computer neither crashes frequently nor requires constant rebooting.

The chapter first acquaints you with the Linux operating system and its history, features, and use in real world applications. Then you proceed to explore different Linux distributions. In addition, you get information about Fedora Linux and its hardware requirements and installation process. You learn about GRUB and LILO boot loaders and different ways to start the Fedora Linux in different desktop environments. Towards the end, you learn to get help on Linux and shut it down.

Let's begin the discussion by introducing Linux.

Introducing Linux

Linux is an operating system based on Linux kernel. A Linux kernel is a core component of the Linux operating system that manages resources. Linux is a multiuser and multitasking operating system, which means multiple users are able to log in and perform multiple tasks simultaneously. It enables the users to work either by using different interfaces, such as Command Line Interface (CLI) and Graphical User Interface (GUI). K Desktop Environment (KDE) and GNOME are two common and popular GUI environment used in Linux.

Linux manages the various aspects of your system. Some of them are as follows:

- **Processor:** Schedules and prioritizes multiple tasks
- **Memory:** Moves processes that exceed the available memory to swap space, which is an area on a hard drive to control the overflow of the processes
- **Devices:** Support various hardware devices and also manages the size of kernel
- **File systems:** Manage different file system formats, such as VFAT, NTFS, or Linux ext3
- **Security:** Provides restricted user access
- **Graphical User Interface (GUI):** Consists of a graphical interface

Let's now explore the history of Linux.

Exploring the History of Linux

Linux is invented in 1991 by Linus Torvalds who was a student at the University of Helsinki. He was working on MINIX, a UNIX-like operating system for his academic use. The source code for MINIX is also freely available, however the modification and redistribution of the source code is not permitted. Linus Torvalds starts a project that later took the shape of Linux kernel. The Linux kernel was initially called as terminal emulator, which was a program designed specifically for hardware to incorporate the new features in the PC. The first basic version of Linux kernel is 0.01, which was released on 25th August 1991. The second version is 0.02, which was released on 5th October 1991 that still needs MINIX to operate. Later on 19th December in the same year, Linux kernel as a functional and stand-alone UNIX-like

operating system was released with the name of Version 0.11. Now, its been around two decades and many Linux kernel versions are released in between till now. The latest Linux kernel version is 2.6.32.1.

Let's now explore the use of Linux in real-life scenarios.

Using Linux in the Real World

Linux can be used for several purposes in today's world. For example, it can be used by individuals in schools, companies, and large organizations to develop fun and educational applications. In addition, it is used in projects, gadgets, and in outer space applications.

The use of Linux has resulted in various creative projects, such as MythTV (acts as a personal video recorder), Asterisk Telephony Project (includes PBX telephony engine that is used to create an IP or hybrid PBX to communicate over the Internet), or Linux Toys and Make (refer to books used to create gaming consoles, home network server, or weather monitor). In addition to projects, Linux is used in gadgets, such as Netbooks, Sony PlayStations, mobile phones, and personal handheld devices. It is also used in the Roving Sequencing and Visualization Program (RSVP) application developed by NASA.

After knowing use of Linux in the real world, let's describe its features.

Exploring Features of Linux

Linux provides you the plethora of features that are different from other operating systems. Some of the distinguishing features are as follows:

- **No constant rebooting:** Allows you to install and remove software without rebooting the computer
- **Start/ stop services:** Enable you to start and stop individual services, such as Web, file, and e-mail services, without either rebooting computer or interrupting the work of a user
- **Portable software:** Modifies an application or driver to make it work on different computer architectures or operating systems
- **Downloadable applications:** Help you to download and install the required applications with a single command with the help of tools, such as apt, urpmi, and yum
- **No settings hidden in code or registries:** Allow you to modify the code according to the requirement because Linux is an open source software
- **Freedom:** Allows you to select any Linux distribution and access to source code. You can also add or remove any software as per the requirement
- **Swap space:** Refers to the area on your hard disk that is used to handle the overflow of running processes and data

Till now, you learned about Linux as an operating system. However, Linux itself consists of different distribution packages, such as Ubuntu and Debian. Now moving further, let's get familiar with different distributions of Linux.

Exploring Linux Distributions

Linux distributions are the packages consisting of one or more programs that are required to perform a single function by an operating system. You can also add features to enhance the capability of the operating system. These distribution packages are often called as distros. Linux distributions are part of Linux operating systems. It is already stated that Linux is based on Linux kernel. A single Linux operating system comprises different distribution packages that include the source code to compile and install the desired Linux distribution package on your system. You can install any distribution package as per your requirement.

In the following section, you get familiar with Ubuntu, Debian, Gentoo, KNOPPIX, SUSE and openSUSE, Yellow Dog Linux, Slackware, Mandriva, Freespire and Xandros, and Fedora.

Ubuntu

Ubuntu is a distribution package based on the Unstable branch of Debian distribution. The features of Ubuntu distribution of Linux include fast release cycle, up–to-date and numerous packages, fast download mirrors, and great documentation.

Let's now briefly describe the Debian distribution.

Debian

The Debian distribution package started as a non-commercial project. It is based on open source code philosophy. Debian consists of three branches, which are as follows:

- **Stable:** Refers to latest release
- **Unstable:** Refers to branch that is in perpetual evolution
- **Testing**: Represents the branch to be released in future

Let's now briefly describe the Gentoo distribution.

Gentoo

The Gentoo distribution package allows you to compile the source code according to the requirement. This distribution does not have any pre-compiled binaries for software. The Gentoo distribution was initially called as Enoch Linux distribution.

Let's now briefly describe the KNOPPIX distribution.

KNOPPIX

The KNOPPIX distribution provides you with efficient compression mechanism and automatic hardware detection. One of the advantages of Knoppix is that it is a live-CD distribution (refers to distribution package that can run directly from a CD and does not require a hard drive for its installation).

Let's now briefly describe the SUSE and openSUSE distribution.

SUSE and openSUSE

SUSE is a freely available distribution package, which is used for desktop installations. It is a stable distribution package consisting of configuration tools, such as YaST. On the other hand, openSUSE is a commercial project developed by Novell

Let's now briefly describe the Yellow Dog Linux distribution.

Yellow Dog Linux

The Yellow Dog Linux distribution package can be used to run a Web server (such as Apache, Perl and PHP), database server (MySQL and PostgreSQL), and network server (NFS and Webmin).

Let's now briefly describe the Slackware distribution.

Slackware

The Slackware distribution package is used when simplicity and stability of the operating systems is concerned. Plain text files are used for its configuration. The latest version of Slackware is 13.0.

Let's now briefly describe the Mandriva distribution.

Mandriva

Mandriva uses an RPM-based package management along with urpmi and configuration tools. The consistency and usability of Mandriva is due to the presence of Drak tools, such as DrakX installer, RPMDrake software management window, and Mandriva Linux Control Center.

Let's now briefly describe the Freespire and Xandros distribution.

Freespire and Xandros

The Freespire distribution of Linux can be called the successor of Linspire and sponsored by Xandros. This distribution package is inexpensive, easy to install, and simple to operate by a non-technical user.

While, Xandros is a Debian basedLinux distribution package, which is developed by the Xandros Corporation.

Let's now briefly describe the Fedora distribution.

Fedora

Fedora is a distribution package that is suitable for both server as well as desktops. It provides you with the graphical interface and configuration tools. In addition, Fedora is used for general-purpose distribution.

In the following section, let's learn about Fedora Linux in detail.

Exploring Fedora Linux

Fedora Linux came into existence when Red Hat Inc. divides itself into Fedora Project (originally called as Fedora Core that produces operating systems based on Fedora) and Red Hat Enterprise Linux. The difference between Fedora and Red Hat Enterprise Linux (RHEL) is the former encourages open source development whereas the later fulfills the need of paid users.

You can perform various tasks using Fedora, such as you can use it as a personal desktop (that includes various desktop features used by a technical person, for example updates) or as a personal server (such as file, print, or Web server). You can also build your own Linux system by repackaging the Linux according to your requirement. Customized software can also be developed using Fedora.

Fedora is an RPM-based Linux distribution package. It uses RPM format for storage and maintenance of its software. The RPM packages are installed in Fedora using either the yum tool or rpm command. There are various versions of Fedora Linux available in the market. Fedora 12 is the latest version of Fedora Linux. In our case, we are using Fedora 11, which was released on 9th June 2009 and name of its code is Leonidas.

Let's discuss the features of Fedora Linux.

Exploring the Features of Fedora Linux

You can use Fedora Linux in many ways depending on its features, such as configured online software repositories, standard information (for example, date, time, and zone), network installation, and up gradation. In addition to these features, the new enhanced features of Fedora 11 are listed as follows:

- **Fast Booting:** Takes less time to turn-on a PC to a GNOME desktop
- **Extended4 (Ext4) File System:** Supports Ext4 file system that enables you to store file systems of size up to 1 EB (ExaByte) and up to 16 TB (TeraByte)
- **Better Graphics:** Uses X.server 1.6 that provides stable display of graphics
- **Synaptics Touchpad Improvements:** Provides you with the touchpad feature as in laptops
- **DNS Security Extensions (DNSSEC):** Provides you with the enhanced security features

Let's learn how to deploy Fedora Linux.

Deploying Fedora Linux

After exploring Fedora Linux and its features, you must know the hardware requirements for the proper installation of Fedora Linux, in our case, Fedora 11. After fulfilling all the hardware requirements, you can start **installation process for Fedora 11**.

In the following sections, let's get familiar with the hardware requirements and the process to install Fedora Linux on your system.

Exploring Hardware Requirements to Install Fedora Linux

The hardware requirements to install Linux depend on desired distribution package. Table 1.1 lists the minimum requirements needed to install the Fedora Linux operating system:

Table 1.1: Linux Hardware Requirements	
Hardware Components	**Recommended requirement**
Processor	Requires 200 MHz Pentium for text-only installation and 400 MHz Pentium for a GUI installation
RAM	Requires 64 MB RAM for installation of any Linux distribution that run in text mode and at least 192 MB for working with Linux distribution in graphical mode
DVD or CD drive	Requires a DVD or CD drive to install Linux distributions
Network card	Requires a network card to be installed. For example Ethernet is required to install Linux distributions
Disk space	Requires 3 GB for an average desktop installation; 600 MB for a minimal server without GUI application; or 7 GB to install all packages

In the next section, let's learn about how to install Fedora Linux.

Installing Fedora Linux

Perform the following steps to install Linux:

1. *Insert* the DVD in the CD/DVD driver and reboot the computer. A welcome screen appears (Fig.Linux-1.1).
2. *Select* the required installation option from the list. In this case, we have selected the Install or upgrade an existing system option (Fig.Linux-1.1).

   A Disc Found dialog box appears (Fig.Linux-1.2).
3. *Select* the **Skip** option (Fig.Linux-1.2).



Fig.Linux-1.1



Fig.Linux-1.2

A screen appears indicating the starting of the installation process (Fig.Linux-1.3).

Fedora installer loads and a fedora welcome screen appears (Fig.Linux-1.4).

4. *Click* the **Next** button (Fig.Linux-1.4).



Fig.Linux-1.3



Fig.Linux-1.4

A screen appears (Fig.Linux-1.5), displaying the list of languages.

5. *Select* the required language from the list (Fig.Linux-1.5). In this case, we have selected English (English) option.
6. *Click* the **Next** button (Fig.Linux-1.5).

   A screen appears (Fig.Linux-1.6), displaying the list of appropriate keyboard layouts for the computer.
7. *Select* the required keyboard layout (Fig.Linux-1.6). In our case, we have selected the **U.S. English** option.
8. *Click* the **Next** button (Fig.Linux-1.6).

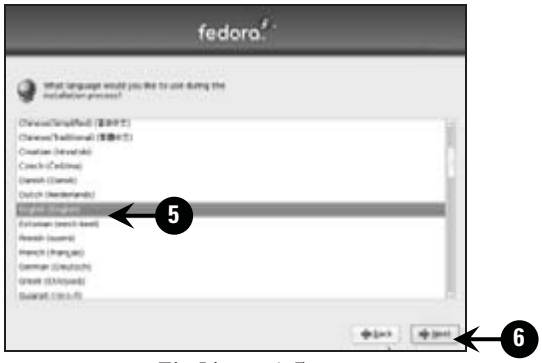


Fig.Linux-1.5



Fig.Linux-1.6

A screen appears (Fig.Linux-1.7) to type the name of your computer.

9. *Type* the name of your computer in the **Hostname** text box (Fig.Linux-1.7). In our case, we have *typed* the hostname as **Kogent.**
10. *Click* the **Next** button (Fig.Linux-1.7).

    A screen appears to select the location (Fig.Linux-1.8).
11. *Select* the city from the map (Fig.Linux-1.8). In our case, we have selected Kolkata, Asia.
12. *Click* the **Next** button (Fig.Linux-1.8).

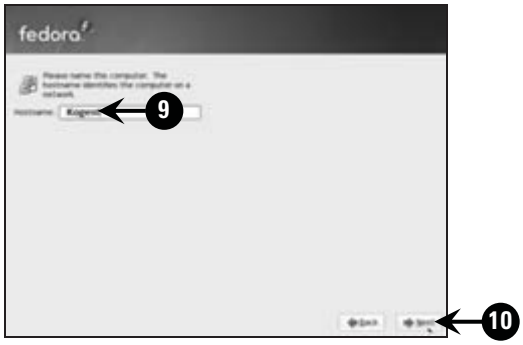


Fig.Linux-1.7



Fig.Linux-1.8

The selected city appears in the drop-down list box (Fig.Linux-1.9).

13. *Click* the **Next** button (Fig.Linux-1.9).

    A screen appears (Fig.Linux-1.10), in which you can enter the root password.
14. *Type* the password for the system administrator (root) in the **Root Password and Confirm** text boxes (Fig.Linux-1.10).
15. *Click* the **Next** button (Fig.Linux-1.10).



Fig.Linux-1.9

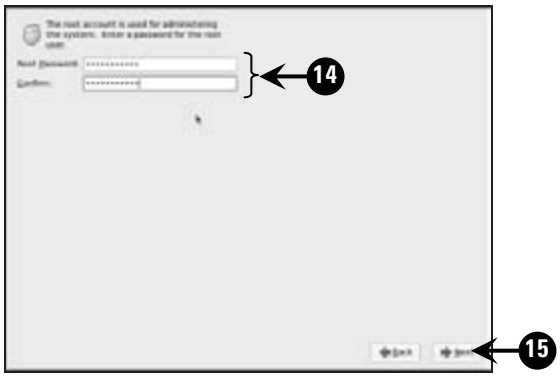


Fig.Linux-1.10

A screen, displaying the partitioning part, appears (Fig.Linux-1.11). In our case, we are using the entire drive because we are doing a fresh installation.

16. *Click* the **Next** button (Fig.Linux-1.11).

    The **Writing storage configuration to disk** dialog box appears (Fig.Linux-1.12).

17. *Click* the **Write changes to disk** button (Fig.Linux-1.12).



Fig.Linux-1.11



Fig.Linux-1.12

The screen displaying the progress of writing changes to disk process appears, as shown in Fig.Linux-1.13:

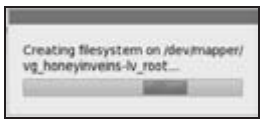


Fig.Linux-1.13

The Bootloader Configuration screen appears. In our case, we are using the default settings (Fig.Linux-1.14).

18. *Click* the **Next** button (Fig.Linux-1.14).

    The customization settings screen appears (Fig.Linux-1.15).

19. *Select* the **Software Development** check box (Fig.Linux-1.15).
20. *Select* the **Web Server** check box (Fig.Linux-1.15).
21. *Select* the **Customize now** radio button (Fig.Linux-1.15).
22. *Click* the **Next** button (Fig.Linux-1.15).



Fig.Linux-1.14

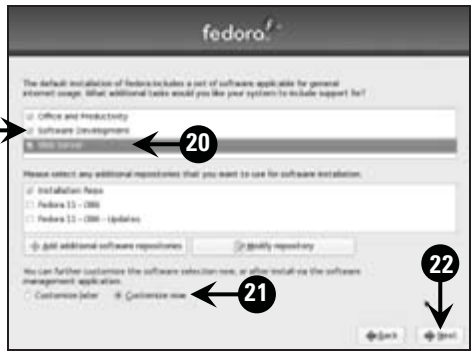


Fig.Linux-1.15

The customization requirement screen appears (Fig.Linux-1.16).

23. *Click* the **Next** button (Fig.Linux-1.16).

A screen appears that displays the starting of installation progress of Fedora Linux (ig.Linux-1.17).



Fig.Linux-1.16



Fig.Linux-1.17



You can select the optional packages depending on the to be installed by clicking the Optional packages button.

A screen appears that displays the installation of Fedora Linux (Fig.Linux-1.18).

When Fedora Linux is installed, a screen appears displaying the congratulations message (Fig.Linux-1.19).

24. *Click* the **Reboot** button (Fig.Linux-1.19).



Fig.Linux-1.18



Fig.Linux-1.19

Fedora 11 operating system boots for the first time (Fig.Linux-1.20).

A Boot Configuration Wizard appears. The **Welcome** screen appears (Fig.Linux-1.21).

25. *Click* the **Forward** button (Fig.Linux-1.21).

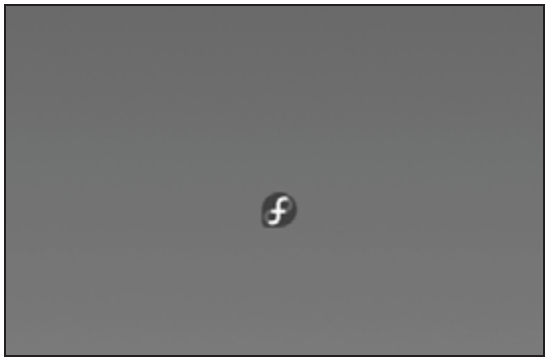


Fig.Linux-1.20



Fig.Linux-1.21

The **License Information** screen appears (Fig.Linux-1.22).

26. *Click* the **Forward** button (Fig.Linux-1.22).

The **Create User** screen appears (Fig.Linux-1.23).

27. *Type* username in the **Username** text box (Fig.Linux-1.23).
28. *Type* full name of the user in the **Full Name** text box (Fig.Linux-1.23).
29. *Type* password in the **Password** text box (Fig.Linux-1.23).
30. *Re-type* password in the **Confirm Password** text box (Fig.Linux-1.23).
31. *Click* the **Forward** button (Fig.Linux-1.23).



Fig.Linux-1.22

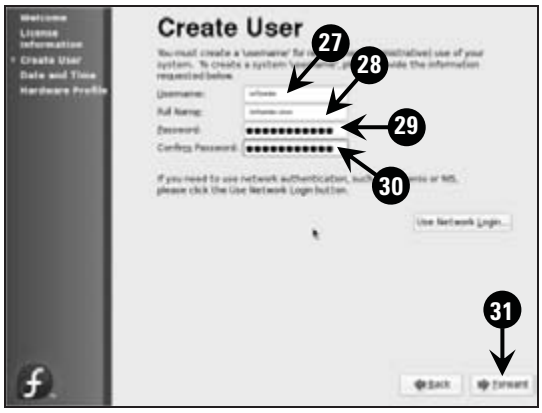


Fig.Linux-1.23

The **Date and Time** screen appears (Fig.Linux-1.24).

32. *Set* the date and time of your computer (Fig.Linux-1.24).
33. *Click* the **Forward** button (Fig.Linux-1.24).

The **Hardware Profile** screen appears (Fig.Linux-1.25).

34. *Click* the **Finish** button (Fig.Linux-1.25).



Fig.Linux-1.24



Fig.Linux-1.25

A login screen appears (Fig.Linux-1.26).

35. *Click* the username (Fig.Linux-1.26).
36. *Type* the password in the **Password** text box (Fig.Linux-1.27).
37. *Click* the **Log In** button (Fig.Linux-1.27).



Fig.Linux-1.26

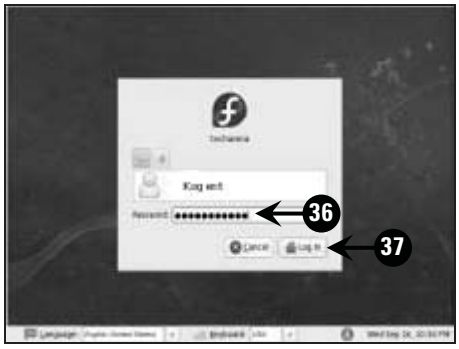


Fig.Linux-1.27

The Fedora desktop screen appears, as shown in Fig.Linux-1.28:



Fig.Linux-1.28

After installing Fedora Linux, let's explore GRUB and LILO Boot in the next section.

Using GRUB and LILO Boot Loaders

A boot loader helps you boot the operating system installed on the hard disk of your system. The Linux operating system lets you select from two boot loaders, GRUB or LILO. The first process that takes place,

when you turn on a computer after installation of a program is booting. The process of booting takes place through a boot sequence that consists of initial set of instructions to start the computer. Boot loader is an application that is responsible for loading and starting the Linux operating system for a computer.

It can be invoked in any of the following ways:

- Basic Input Output Stream (BIOS) passes control to the initial program loader (IPL) installed within a drive's Master Boot Record (MBR).
- BIOS passes control to another boot loader, which in turn passes control to an installed IPL, within a partition's boot sector.

GRUB, stands for **GRand Unified Bootloader** and is the default GNU boot loader, which comes with Linux. This boot loader resides on your system's hard disk and starts Linux when you start your computer. It is the first thing that appears after the booting of your computer. GRUB is dynamically configured (dynamic configuration refers to the configuration, which is loaded at startup of the Linux operating system). It also consists of the features that support executable multiple formats, multi-boot and non-multi-boot operating systems, and automatic decompression of boot images. GRUB can be run from or installed on any device, such as floppy, CD-ROM, USB drive, or even on the network.

LILO stands for Linux LOader. The LILO boot loader does not depend on any particular file system and can boot an operating system from floppy disks and hard disks. On some of the Linux distributions, such as Slackware, LILO is the default boot loader instead of GRUB. LILO is placed in Master Boot Record (MBR) and can boot and set each parameter of kernel independently.

In our case, we are booting our system with GRUB boot loader. You can also boot your system with LILO boot loader according to the requirement. If you want to use LILO boot loader, you can do it in two ways. If you are doing fresh installation of any Linux distribution on your system, then you can boot your computer with LILO boot loader. If Linux distribution is already installed on your system, then you first need to download latest version of LILO and then type the following command, as the root user, at the Terminal window:

```
/sbin/lilo -v -v
```

This command uses the default setting present in Master Boot Record (MBR). After installing LILO, you can configure it. All the configurations are made in the configuration file located at /etc/lilo.conf.



In case, if you are booting your system with boot loader other than the default one set for your system then it is advisable to take the backup of entire system including important documents and system settings on some external storage device, such as pen drive or external hard disk.

In the next section, let's learn to install GRUB boot loader.

Installing the GRUB Boot Loader

GRUB is a very powerful boot loader, which can load a wide variety of free operating systems. One of the important features in GRUB is flexibility; GRUB understands filesystems and kernel executable formats.

Let's perform the following steps to install the GRUB boot loader:

1. *Select* **Applications→System Tools→Terminal** in the Applications menu from the top panel to open the Terminal window.

   The Terminal window appears (Fig.Linux-1.29).

2. *Type* the **grub** command in the root mode (Fig.Linux-1.29).
3. *Press* the **ENTER** key. This shows the GNU GRUB version (Fig.Linux-1.30).

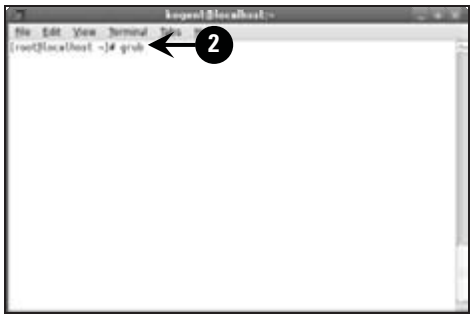


Fig.Linux-1.29



Fig.Linux-1.30

4. *Type* the **root (hd0,0)** command (Fig.Linux-1.31).
5. *Press* the **ENTER** key. This shows you the file system and the partition type of the hard disk (Fig.Linux-1.31).
6. *Type* the **setup (hd0)** command again in the Terminal window (Fig.Linux-1.32).
7. *Press* the **ENTER** key. This installs the GRUB boot loader in the hard disk (Fig.Linux-1.32).



Fig.Linux-1.31



Fig.Linux-1.32

8. *Type* the **quit** command beside the grub> boot loader to get back to the root mode (Fig.Linux-1.33).
9. *Press* the **ENTER** key. The root mode appears, as shown in Fig.Linux-1.33:

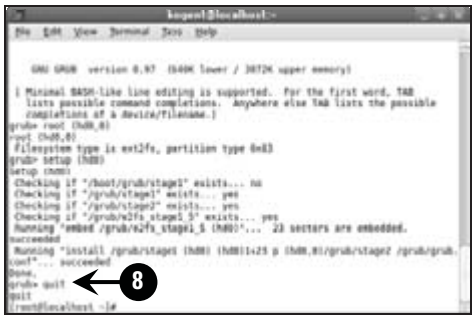


Fig.Linux-1.33

After learning about GRUB installation, let's now learn to configure the GRUB boot loader next.

Configuring the GRUB Boot Loader

GRUB is a boot loader, which enables you to boot multiple operating systems for a wide range of filesystems. It is the most popular boot loader nowadays, as it has lots of possible root filesystems on which Linux can reside. The information about GRUB boot loader is documented in the GNU info file.

You can view the documentation by typing the **info grub** command in the Terminal window as shown in Fig.Linux-1.34:



Fig.Linux-1.34

You can make any changes you want in your boot loader using this file.

In the following section, let's introduce the Fedora desktop.

Introducing the Fedora Desktop

After installing Fedora Linux on your system, you can select any of the three desktop environment. These three choices are K Desktop Environment (KDE), GNOME Desktop, and X and Window Manager.

Let's briefly describe these choices in the following section, beginning with K Desktop Environment.

K Desktop Environment

KDE, apart from providing you with common desktop features, such as panels, Window managers, or toolbars, let you access features, such as Amarok (audio player), Konsole (terminal emulator), Kopete (instant messaging client), and Konqueror (Web browser and File manager). It also provides various applications for Graphics, Multimedia, Games, and Administration utilities.

Let's now briefly describe GNOME desktop environment.

GNOME Desktop Environment

The GNOME desktop environment provides you a streamlined interface. It consists of a small set of features as compared to KDE. In addition, it is the default desktop environment provided by Fedora Linux. The goal of GNOME desktop environment is to emphasize simplicity, usability, freedom to free license, and accessibility.

Let's now briefly describe X and a Window Manager.

X and a Window Manager

X and a Window manager refers to the Window manager used by Linux operating systems. It is rarely used for common purposes and consists of an X Window System server and any Window manager according to the requirement. Some of the Window managers, such as Xfce and fluxbox, are useful for low-end and low-resource machines.

After knowing about different desktop environments, let's learn how to start the desktop in different ways.

Starting the Desktop

Linux distribution packages provide you with the options to customize the look and appearance of your desktop. The booting of desktop takes place after completing the installation of Fedora Linux. The desktop can be either GUI or a text-based login. A graphical login screen automatically directs you to a

graphical desktop. However, if you login from a CUI, graphical desktop has to be started manually by typing the **startx** command and pressing the ENTER key.

In the following sections, let's learn about booting right to the desktop and booting up to the graphical login screen mode and the text prompt mode.

Booting Right to the Desktop

Many Linux distributions start with the desktop mode automatically. These distributions do not require you to login. In addition, some Linux distributions enable you to directly work with Fedora Linux from a bootable CD without installing it on the hard disk of your system. A common example of this type of distribution is KNOPPIX, which works on a particular username.

Let's now learn to start the desktop as the graphical login screen.

Booting up to the Graphical Login Screen

Linux distributions that are installed on hard disks boot up to the graphical login screen. Different GUIs display their own logos and other graphical elements on the login screen because these are configurable. A computer displays the default desktop environment, but you can also change these desktop environments defined on Linux computers (for example Fedora Linux). In Fedora Linux, the default login screen is based on GNOME Display Manager (gdm). You just need to type username and password in the login screen to start a desktop environment session.

Let's now learn to start up the desktop directly as the text prompt.

Booting up to the Text Prompt

In some of the Linux distributions, a CUI appears in place of a GUI to display the following login prompt:

```
Welcome to XYZ Linux
your computer login:
```

The preceding login prompt appears for the operating system that is typically installed as a server. You can switch from a CUI to a GUI in cases where X and other required desktop components are installed. The following command is used to switch from CUI to GUI:

```
$ startx
```

However, it is not necessary that specific distribution must switch from a CUI to a GUI. This is because some of the Linux distributions may not even have a desktop environment installed.

Till now, you explored different ways to boot up a desktop, let's learn how to get help on Linux.

Getting Help on Linux

You can use the help feature of the Linux operating system for round the clock assistance. The functioning of the help feature in Linux is similar to other operating systems. The Help feature contains various links and a Search text box, which you can use to find information from the Help section either by clicking any link or typing a keyword in the Search text box.

Let's perform the following steps to get access to the Linux help file:

1. *Select* the **System** menu. A drop-down list appears (Fig.Linux-1.35).
2. *Select* the **Help** option, as shown in Fig.Linux-1.35:



Fig.Linux-1.35

The **Desktop** window appears (Fig.Linux-1.36).

3. *Click* the link you want to open. In our case, we have selected the **Desktop User Guide** link (Fig.Linux-1.37).



Fig.Linux-1.36



Fig.Linux-1.37

The **Desktop User Guide** window appears (Fig.Linux-1.38).

4. *Click* the topic of which information is required. In our case, we have selected the **Introduction** link (Fig.Linux-1.38).

The Introduction window appears displaying the topics (Fig.Linux-1.39).



Fig.Linux-1.38



Fig.Linux-1.39



Help on Linux can also be obtained through the man command. This feature displays help screen, describing the program and its use.

In the last section, let's learn how to shut down the Linux system.

Shutting Down Linux

You need to shut down your computer in correct way to save your files on the hard drive. If you switch off your computer directly, you can lose all the data, and the hard drive of the computer can also be damaged.

Perform the following steps to shut down the Linux operating system:

1. *Select* the **System** menu. A drop-down list appears (Fig.Linux-1.40).
2. *Select* the **Shut Down** option, as shown in Fig.Linux-1.40:

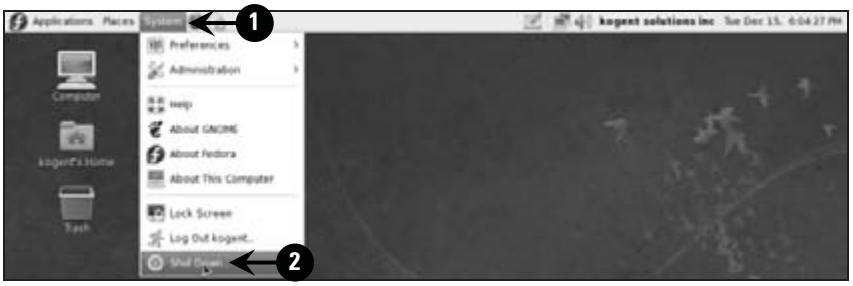


Fig.Linux-1.40

A dialog box appears (Fig.Linux-1.41).

3. *Click* the **Shut Down** button, as shown in Fig.Linux-1.41:

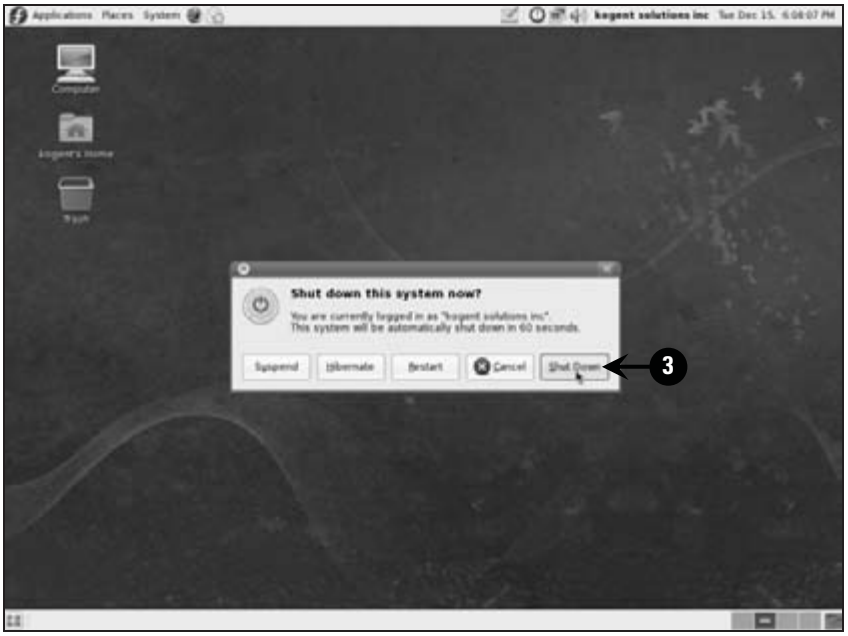


Fig.Linux-1.41



Your computer gets shut down in 60 seconds automatically by default, if you do not click any button present in the dialog box.

Before ending the chapter, let's summarize the key points discussed in it.

Summary

In this chapter, you explored Linux, its history, use in real world, and features. You also explored Linux distributions and Fedora Linux in detail. In addition, you got information about the hardware requirements for installing Fedora Linux. After that, you learned to install Fedora Linux. You also get familiarized with GRUB and LILO boot loaders in Fedora Linux. You learned to start different modes of Linux desktop environment. You can use the Help feature of the Linux, and shut down the computer.

CHAPTER

2

Working with K Desktop Environment

In this Chapter:

- Exploring K Desktop Environment
- Organizing your KDE
- Working with Dolphin and Konqueror File Managers

K Desktop Environment (KDE) desktop is now present in almost every Linux distributions, such as Fedora and Ubuntu. The latest version KDE 4 is more innovative than the earlier version of KDE that is KDE 3.5, which is still in use. KDE provides you with Plasma desktop and a new improved and enhanced interface. The KDE enables you to manage files, windows, multiple desktops (virtual desktops), and different applications simultaneously. KDE enables you to use its drag and drop feature and right-click any image or icon. Overall, KDE overcomes the lack of integrated and standardized desktop environment.

This chapter describes about KDE. Next, you learn how to customize your KDE desktop. Further, you explore how to add widgets to the panel and on the desktop. Towards the end, you get acquaint with different KDE file managers, such as Dolphin and Konqueror.

Exploring K Desktop Environment

Some of the new enhancements of KDE 4 are new libraries that support multimedia applications, new applications for viewing documents (for example, Okular), or a new file manager, such as Dolphin. The alluring Plasma desktop of KDE 4 provides a new look to your desktop. Features that allow you to find and present information are improvised, such as KRunner and KickOff. Many applets and applications can also be added on the KDE desktop. The interface of KDE is shown in Fig.Linux-2.1:



Fig.Linux-2.1

Following are some of the key elements of KDE:

- **Plasmoids:** Refer to the applets that can be added to the desktop, such as picture frame and news ticker.
- **Konqueror:** Refers to the default Web browser of KDE 4.
- **Dolphin:** Refers to the default file manager that comes with KDE 4.
- **Panel:** Provides you with tools and icons for quick access to applications.
- **Application Launcher/ Menu:** Refers to a button that opens a new KickOff Application menu, which allows you to search for the application installed on your system.
- **Taskbar:** Displays the currently running applications. You can toggle between the opened application windows by minimizing and restoring them.
- **Desktop Pager:** Consists of icons that allow you to switch to virtual desktops. By default, 4 virtual desktops are present in KDE 4. These virtual desktops are similar to the workspaces present in GNU Network Object Model Environment (GNOME) desktop.
- **Mini Applets:** Refer to the mini view or iconic view of the running applications, such as media player, clipboard, and battery power managers.



We can save files and folders either in the home folder or at the desktop.

In the following section we have placed some of the files, folders, and icons to show the arrangement of the desktop as required.

Now, let's learn how to organize KDE on your system.

Organizing your KDE

There are times when desktop of your system looks cluttered with icons all over you desktop. You can arrange the icons according to your preference in KDE 4. You can arrange icons By Name, By Size, By Type, and By Date. You can also add shortcuts of different applications on the desktop.

In this section, you learn to arrange icons, pinning windows, adding widgets to the desktop. You also learn to add widgets to the panel present on the desktop.

Let's now learn how to organize your desktop icons.

Arranging Desktop Icons

There are times when many icons get placed on your desktop with the passing time. In most of the cases, therefore, it becomes difficult to find the required file easily among numerous files, folders, and icons placed on your desktop. As already discussed, in the preceding section, you can arrange different icons according to your requirement. In our case, we are arranging the icons using the By Name option.

Perform the following steps to arrange the icons:

1. *Right-click* the blank space on your desktop. A context-menu appears (Fig.Linux-2.2).
2. *Select* the **Icons** option. A sub-menu appears (Fig.Linux-2.2).
3. *Select* the **Sort Icons** option. A sub-menu appears (Fig.Linux-2.2).
4. *Select* the **By Name** option (Fig.Linux-2.2).

   The icons are arranged according to the names (Fig.Linux-2.3).

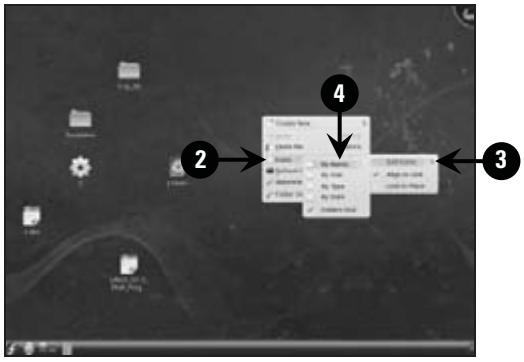


Fig.Linux-2.2



Fig.Linux-2.3

Now, let's learn how to pin an application.

Pinning Windows on the Top/Bottom of Desktop

Pinning windows means to set the position of the application windows according to the requirement. You can open multiple application windows simultaneously on the desktop, described later in the chapter. You can set a particular application window either to be placed at the top of other opened application windows or at the bottom, as and when required. In our case, we pin the **Authentication Configuration** window on top of other opened windows.

Perform the following steps to pin an application window:

1. *Open* any application window. In our case, we have opened **Authentication Configuration** window (Fig.Linux-2.4).

2. *Right-click* the **Title bar** of the **Application Configuration** window. A context-menu appears (Fig.Linux-2.5).
3. *Select* the **Advanced** option. A sub-menu appears (Fig.Linux-2.5).
4. *Select* the **Keep Above Others** option (Fig.Linux-2.5).

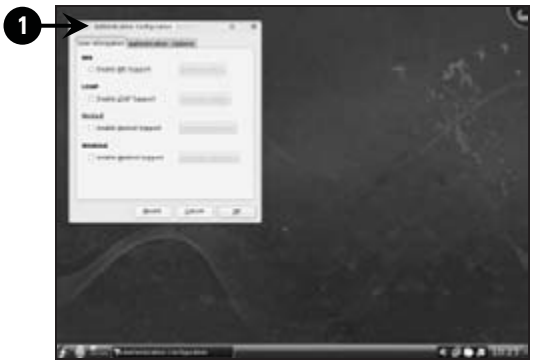


Fig.Linux-2.4

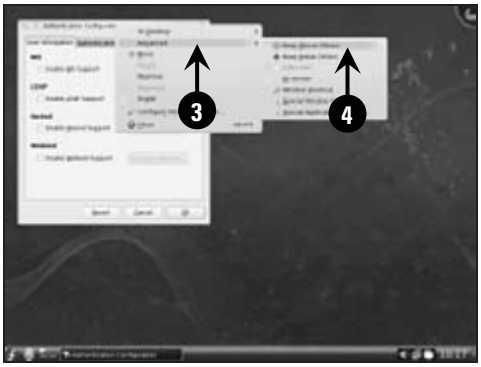


Fig.Linux-2.5

5. *Open* any other application window. In our case, we have opened the **System Settings** application window, as shown in Fig.Linux-2.6:



Fig.Linux-2.6

The **Authentication Configuration** window remains on top of the **System Settings** window (Fig.Linux-2.6).

Now, let's learn how to add widgets.

Adding Widgets to the Panel and Desktop

Widgets are generally referred to as a short form for window gadgets. These are the applications that can be run either simultaneously, such as clock. The applications that are accessed frequently are placed as a widget either on a panel or on the desktop. Widgets can be added to the panel as well as to the desktop.

In the following sections, you learn to add widgets to both panel and desktop.

Now, let's learn how to add a widget to the panel.

Adding Widgets to the Panel

Perform the following steps to add a widget to a panel:

1. *Right-click* the blank space on the panel. A context-menu appears (Fig.Linux-2.7).
2. *Select* the **Panel Options** option. A sub-menu appears (Fig.Linux-2.7).

3. *Select* the **Add Widgets** option (Fig.Linux-2.7).
   An **Add Widgets** dialog box appears (Fig.Linux-2.8).
4. *Drag* the scroll-bar to select the required widget (Fig.Linux-2.8).
5. *Select* the widget. In our case, we select the **Calculator** widget (Fig.Linux-2.8).
6. *Click* the **Add Widget** button (Fig.Linux-2.8).

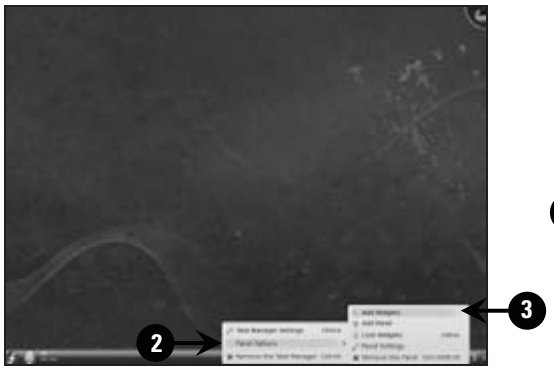


Fig.Linux-2.7



Fig.Linux-2.8

The **Calculator** widget appears on the panel (Fig.Linux-2.9).

7. *Click* the **Close** button to close the dialog box (Fig.Linux-2.10).



Fig.Linux-2.9



Fig.Linux-2.10

Let's now learn how to add widget to the desktop.

Adding Widgets to the Desktop

Perform the following steps to add widget to the desktop:

1. *Right-click* the blank space on desktop. A context-menu appears (Fig.Linux-2.11).
2. *Select* the **Add Widgets** option (Fig.Linux-2.11).
   An **Add Widgets** dialog box appears (Fig.Linux-2.12).
3. *Drag* the scroll-bar to select the required widget (Fig.Linux-2.12).
4. *Select* the required widget option. In our case, we select the **System Monitor** option (Fig.Linux-2.12).
5. *Click* the **Add Widget** button (Fig.Linux-2.12).

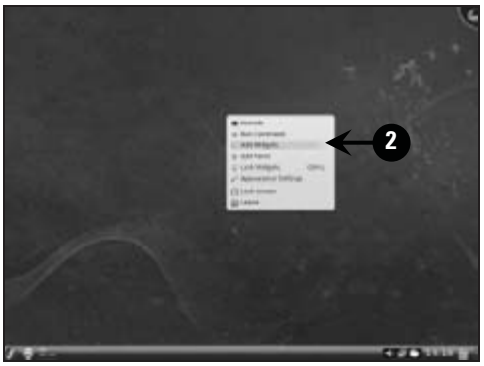


Fig.Linux-2.11



Fig.Linux-2.12

The **System Monitor** widget appears on the desktop (Fig.Linux-2.13).

6. *Click* the **Close** button to close the Add Widgets dialog box (Fig.Linux-2.14).



Fig.Linux-2.13

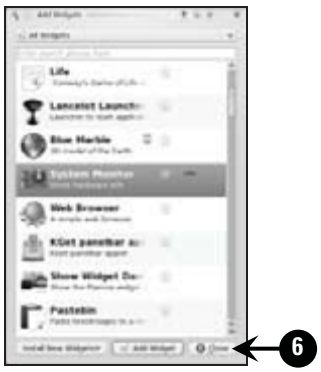


Fig.Linux-2.14

The **Add Widgets** Dialog box gets close.

Now, let's learn about file managers.

Working with Dolphin and Konqueror File Managers

KDE provides two different file managers to manage your files and folders. These two file managers are Dolphin and Konqueror. Dolphin file manager is streamlined to manage files and folders of your system, while Konqueror file manager can hold Web content also.



In KDE, Konqueror is used both as the file manager as well as the Web browser.

In the following sections, let's learn to use Dolphin and Konqueror file managers. Let's begin by Dolphin file manager.

Managing Files with Dolphin File Manager

By default, KDE 4 comes with Dolphin file manager. It is simple and easy to use file manager that provides you with an efficient way to handle files and folders stored on your system. It is free from the overhead of a Web browser unlike Konqueror. Dolphin file manager has simplified interface that emphasizes on speed and optimization to perform quick access to the files and folders stored on the hard drive. Fig.Linux-2.15 shows the interface of Dolphin file manager:



Fig.Linux-2.15

Dolphin file manager consists of the following components:

- **Title Bar:** Displays the name of the application window that is currently opened
- **Menu Bar:** Consists of menus, such as File, Edit, View, and Go
- **Toolbar:** Consists of buttons that provide quick access to various menus
- **Navigation Bar:** Displays the path of the current folder from the home folder
- **Places Pane:** Displays the frequently accessed locations, such as Trash or Root
- **Workspace**: Displays the files and folders of the current folder
- **Information Pane:** Displays the information about the selected file and folder, such as, type and, modified date and time
- **Status Bar:** Displays the number and size of files and folders present in the currently opened folder

Following are some of the features of Dolphin file manager:

- **Navigation:** Allows you to view the full path of the current file or folder
- **Viewing Properties:** Allows you to set the view of files and folder icons, such as details and lists.
- **Filter and Search:** Allows you to search for files and folders instantly when numerous files and folders are present in the current folder
- **Preview:** Allows you to view small representations of the selected file and folder

Now, let's discuss Konqueror file manager.

Managing Files with Konqueror File Manager

Konqueror file manager is used in case when you want to view Web content along with files and folders of your system. It is an efficient tool to be used when you want to switch between the local and the Web content. You can also add bookmarks to files and folders in Konqueror file manager. Some of the important features of Konqueror file manager are:

- **Web Browser Interface:** Provides a Web browser, such as Mozilla Firefox and Internet Explorer
- **Network Desktop:** Enables you to link files using FTP and Web pages using HTTP, if your system is connected to Local Area Network (LAN)

File and MIME Types: Supports various types of file formats and can automatically open a file with a particular application that is corresponding to the file type formats because KDE 4 supports numerous built-in MIME file type formats **Now, let's quick**ly revise the main concepts discussed in the chapter by going through the summary section.

Summary

The chapter started with discussing KDE. You have also learned to organize the desktop according to the requirement by arranging desktop icons and pinning windows. You have also learned to add widgets to the panel and desktop. In the end, you have learned to work with file managers, such as Dolphin and Konqueror file managers.

CHAPTER

3

Working with the GNOME Desktop Environment

In this Chapter:

- Exploring the GNOME Desktop Environment
- Opening a Window
- Closing a Window
- Moving and Resizing a Window
- Viewing the Linux Accessories
- Working with Different Workspaces
- Working with the GNOME Panel

The desktop is a graphical screen containing some pictures using which, we can instruct the operating system to perform various tasks, such as opening application windows or launching different applications. We had selected the graphical option during the installation of Fedora Linux; therefore, when we log on the Linux system, the GNOME desktop of Fedora Linux appears on your screen by default. Fedora Linux provides two types of graphical desktops: the GNU Network Object Model Environment (GNOME) desktop and the K Desktop Environment (KDE) desktop.

The GNOME desktop is the default desktop, which is automatically installed with Linux. If you want to access the KDE desktop also, then you have to install it separately on your system by using the package manager. However, the interface is different for both desktops, but their working is similar. One who can use one of these desktops can easily use the other one. This chapter explores the GNOME desktop as the KDE desktop environment is discussed in the previous chapter of this book.

The chapter begins by exploring the GNOME desktop environment and the components of a window. You learn how to open multiple windows on the desktop simultaneously and how to work with the opened window, such as maximizing, restoring, minimizing, resizing, and moving it. You also learn how to toggle between different windows that are currently opened. You also get acquainted with different workspaces and the GNOME panel. You learn how to add or remove the object at the GNOME panel and drawer. At the end, you learn how to enable the autohide property and how to delete the GNOME panel.

Let's begin by describing the GNOME desktop environment.

Exploring the GNOME Desktop Environment

The GNOME desktop provides you with the components, such as windows, panels, workspaces, and applications. It is the most common desktop environment used in Linux. The following is the brief description of the major components of the GNOME desktop:

- **Desktop:** Refers to an area of the screen in a GUI on which different files, folders, and icons (for example application launchers) are placed for quick and easy access.
- **Panels:** Refers to the two long bars that appear on top and bottom of the desktop. These panels display icons, such as application launcher and indicators (for example, date and time, weather, and name of currently login user). By default, top panel displays the main Menu bar.
- **Workspaces:** Allows you to group similar tasks. Desktop can be subdivided into different workspaces.

Apart from these major components, desktop also contains the following objects:

- **Computer icon:** Provides you access to removable media, such as Floppies and CDs, and to the file computer up to the root level.
- **Home folder:** Refers to the folder where all the personal files of the user are kept. It is labeled as username's Home. This folder can also be accessed from the **Places** menu from the top panel of the GNOME desktop.
- **Trash:** Refers to a location that consists of different files and folders, which have been deleted by the user and are no longer needed. However, the files that are moved to trash can also be restored when they are required.
- **Additional icons:** Refers to the icons that are displayed on the desktop when a CD, removable media, or a device containing files, such as music player or digital player, are inserted.

Let's now learn how to open a file or folder window in the GNOME desktop.

Opening a Window

As already discussed, the desktop is the graphical screen that appears immediately after you log in to an operating system, which is Fedora Linux in our case. The desktop contains some pictures and icons, which are short cuts to the various folders and programs. Some of these icons are Menus containing different programs, commands, and utilities. These pictures and icons are accessed by double-clicking on the respective icons and get opened in a new window.



The main folder that contains all the folders in the Windows operating system is My Computer. The home folder on the Linux Desktop (root's Home in our case) represents the main folder of the system and contains all the other folders and files.

Let's perform the following step to open the home folder window:

1. *Double-click* the folder of which you want to open the window. In our case, we have selected the **kogent's Home** folder (Fig.Linux-3.1).

The window for the home folder gets opened (Fig.Linux-3.2).



Fig.Linux-3.1

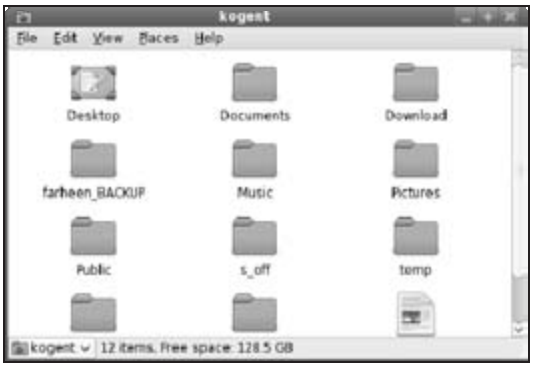


Fig.Linux-3.2

Let's now explore the components of the window.

Exploring the Components of a Window

A window consists of many components (Fig.Linux-3.2) discussed as follows:

- **Title Bar:** Displays the name of the window. For example, Fig.Linux-3.2 displays kogent as the title of the window. The title bar also contains three buttons, namely, minimize, maximize, and close.
- **Menu Bar:** Contains a number of menus. Each menu contains a group of some related commands. For example, the View menu contains all the commands that may be used to change the appearance of the window.
- **Display Pane:** Lists the files, folders, or images that are present in the folder.
- **Status Bar:** Displays information, such as the name of the selected item and the size of a selected file for the currently active window.



If a folder is selected then the Status bar displays the name of the folder and the number of files and sub-folders it contains, and if a file is selected then it displays the name and size of the file. If more than one folders and files are selected then the total number of items they contain and the total file size, respectively, are displayed on the Status bar.

Let's now learn to open multiple windows on the desktop.

Opening Multiple Windows on the Desktop

Sometimes when you want to work with different applications simultaneously, you can open multiple windows of different applications at the same time. The home folder is already opened in the preceding section. In this section, you learn to open windows other than the home folder. In our case, we first open the **Download** folder and then the **polygon_contact1.gif** image file.

Let's perform the following step to open multiple windows:

1. *Double-click* the **Download** folder from the **kogent** window, which you have opened in the preceding section (Fig.Linux-3.3).

   The **Download** folder gets opened in new window (Fig.Linux-3.4).

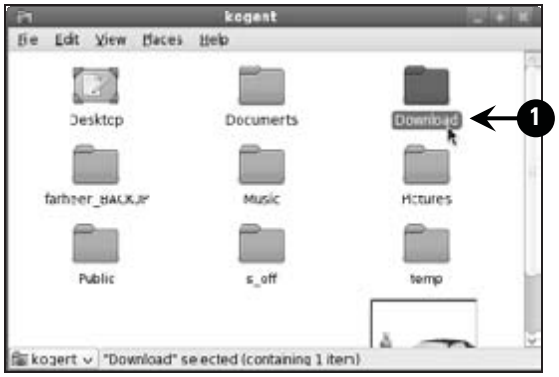


Fig.Linux-3.3



Fig.Linux-3.4

2. *Drag* the scroll-bar to select another required file that is to be opened, if the required file cannot be seen on the folder window (Fig.Linux-3.5).
3. *Double-click* the **polygon_contact1.gif** image (Fig.Linux-3.5).

   The **polygon_contact1.gif** image gets opened in new window (Fig.Linux-3.6).

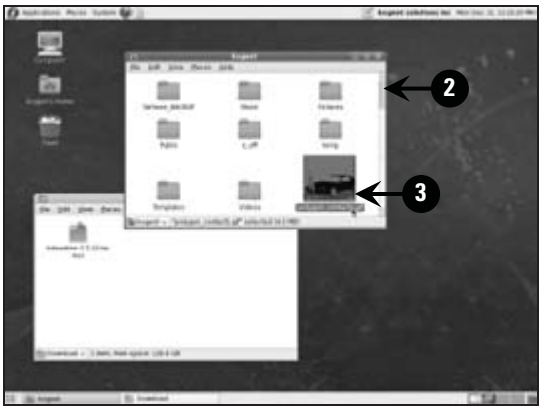


Fig.Linux-3.5



Fig.Linux-3.6

Now there are three icons in the bottom panel, which represent the three open windows. One of them is the current window. To switch over to the other window, just click its icon on the bottom panel. You can simply switch between multiple open windows.

Let's now learn to how to close an opened window.

Closing a Window

When you have finished your tasks in a window and do not need to use the desktop anymore, you can close it. Let's perform the following steps to close a window:

1. *Click* the **File** menu in the menu bar. A drop-down menu appears. In our case, we are closing the **polygon_contact1.gif** file window (Fig.Linux-3.7).
2. *Click* the **Close** option (Fig.Linux-3.7).

   The **polygon_contact1.gif** image gets closed (Fig.Linux-3.8).

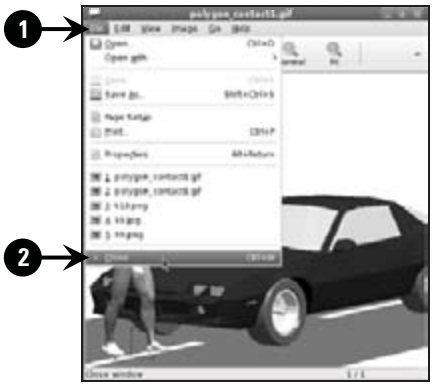


Fig.Linux-3.7



Fig.Linux-3.8



Similarly, you can close other opened windows when you do not need to work on them. You can also close the window by clicking the Close icon, which is present at the top right corner of the window.

Let's now learn how to move and resize a window.

Moving and Resizing a Window

In the GNOME desktop environment, you can manage a window more conveniently by resizing and moving the window. When we open multiple windows, the windows overlap. You can resize the open windows and move them to different locations on the Desktop to manage them easily.

Therefore, let's learn to maximize, restore, and minimize a window by using the buttons present on the Title bar. In addition, you also learn to resize a window manually and moving a window.

Maximizing a Window

When you maximize a window, it gets fitted into the entire computer screen. Maximizing a window makes the window to attain the largest possible size set in its configuration. In our case, we are maximizing the **kogent** window. Let's perform the following step to maximize a window:

1. *Click* the **Maximize** button on the Title bar of the **kogent** window (Fig.Linux-3.9).

   The **kogent** folder window is maximized (Fig.Linux-3.10).



Fig.Linux-3.9



Fig.Linux-3.10

When a window is maximized, it cannot be resized manually because in that case, the edges of the window are not available. Therefore, to resize a window manually, first click the Restore button on the Title bar to change it to its original size.

Let's now learn to restore a window.

Restoring a Window to its Original Size

Restoring means resizing a window to its previous size. You can restore a window by using the Restore (+) button that appears after maximizing a window. In our case, we are restoring the **kogent** window.

Let's perform the following steps to restore a window to its original size:

1. *Click* the **Restore** button on the Title bar (Fig.Linux-3.11).

   The **kogent** folder window is restored to its original size (Fig.Linux-3.12).



Fig.Linux-3.11



Fig.Linux-3.12

Let's now learn to minimize the currently opened window.

Minimizing a Window

When you minimize a window, it temporarily gets hidden from view without closing it and can be seen on the panel as an icon. In such a situation, the contents of the window disappear from the screen and get converted into a small icon. In our case, we are restoring the **kogent** window.

Let's perform the following steps to minimize the window:

1. *Click* the **Minimize** button (Fig.Linux-3.13).

   The **kogent** folder window is minimized, and you can see the icon on the bottom panel of the desktop (Fig.Linux-3.14).



Fig.Linux-3.13



Fig.Linux-3.14

Let's now learn how to resize a window manually.

Resizing a Window Manually

The Minimize, Restore, and Maximize buttons are used to resize a window to a definite or expected size. However, to change the window to the size you want, you can resize it manually. In our case, we are resizing the Download window.

Let's perform the following steps to resize a window manually:

1. *Place* the mouse-pointer on one of the corners of the window. In our case, we placed the mouse-pointer at the bottom-right corner.

   The mouse-pointer changes to a bi-headed arrow (Fig.Linux-3.15).
2. *Drag* the mouse towards the right side. The size of the window increases as you drag the mouse (Fig.Linux-3.15).
3. *Release* the mouse-button after you set the size according to the requirement.

   The window is resized (Fig.Linux-3.16).



Fig.Linux-3.15



Fig.Linux-3.16

Let's now learn how to move a window.

Moving a Window

You can also move a window from one location of the screen to the other. This enables us to view the other parts of the screen.

Let's perform the following steps to move a window:

1. *Place* the mouse-pointer anywhere on the Title bar of the window to be moved. In our case, we are moving the **Download** folder, as shown in Fig.Linux-3.17:



Fig.Linux-3.17

2. *Press* the left mouse-button.
3. *Drag* the mouse to the top of the screen. The mouse-pointer gets converted into the mouse-handler, and the window moves with the mouse (Fig.Linux-3.18).

The window is placed at a new location (Fig.Linux-3.19).



Fig.Linux-3.18



Fig.Linux-3.19

Let's now learn to toggle between different opened windows.

Toggling between the Open Windows

There are situations when different multiple windows are opened on your system simultaneously. However, you work on any one application window at a single point of time, but you may need other application or window for reference or some other reason. In such a case, you can toggle between opened windows according to the requirement. Currently, the **kogent** window is active. In our case, we need to switch to the Download window.

Let’s perform the following step to toggle between the open windows:

1. *Click* the **Download** folder icon present on the bottom panel of the GNOME desktop (Fig.Linux-3.20).

The **Download** window becomes the current window and overlaps the **kogent** window (Fig.Linux-3.21).



Fig.Linux-3.20



Fig.Linux-3.21

Let's now explore the accessories present in the GNOME desktop environment.

Viewing the Linux Accessories

It is beneficial to know about some of the useful utilities of the Fedora Linux GNOME desktop. Fedora Linux provides us with a number of useful programs that are automatically installed along with the Fedora Linux package. These programs are collectively known as the Accessories and are available as a set of commands in the Accessories option of the Application menu. Let's briefly describe these accessories. The functions of the some important GNOME accessories are as follows:

- **Archive Manager:** Lets you create, view, modify, and unpack any archive.
- **Calculator:** Refers to a mathematical and scientific calculator. It that performs the arithmetic, logarithmic, and trigonometric functions.
- **Character Map:** Enables you to select and copy characters from a character table and paste them in a document, such as a Text Editor document.
- **Take Screenshot:** Lets you capture images of regions of applications windows as per the requirement.
- **Text Editor:** Refers to a simple word processor application that is used to create and edit text documents.

Perform let's perform the following steps to view the Linux accessories:

1. *Click* the **Applications** menu from the top panel of the GNOME desktop. A drop-down menu appears (Fig.Linux-3.22).
2. *Select* the **Accessories** option. Further, a sub-menu appears, as shown in Fig.Linux-3.22:

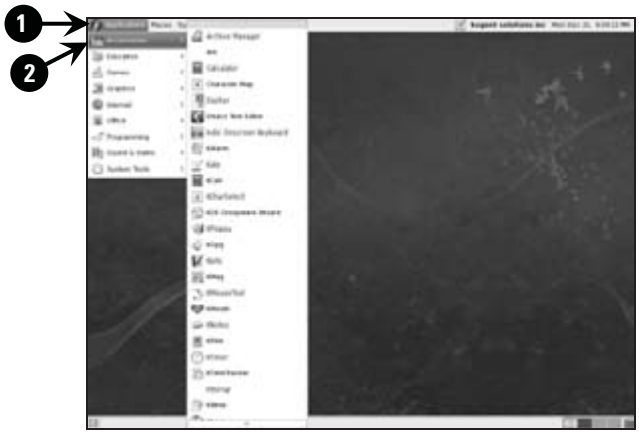


Fig.Linux-3.22

The functions of the some important GNOME accessories are as follows:

- **Archive Manager:** Lets you create, view, modify, and unpack any archive.
- **Calculator:** Refers to a mathematical and scientific calculator. It performs arithmetic, logarithmic, and trigonometric functions.
- **Character Map:** Enables you to select and copy characters from a character table and paste them in a document, such as, a Text Editor document.
- **Take Screenshot:** Lets you capture images of regions of applications windows according toas per the requirement.
- **Text Editor:** Refers to a simple word processor application that is used to create and edit text documents.



The other accessories present in the list comes with the KDE desktop environment, but are also seen in the accessories menu of the GNOME desktop environment.

Let's now learn how to work with different workspaces.

Working with Different Workspaces

Workspaces can be defined as the virtual screen or the root window on which all the other windows and applications appear. By default, four workspaces are defined. More workspaces can be defined, and you can switch between these different workspaces according to the requirement of the user. Each workspace consists of same desktop, same panels, and same menus. However, the only difference between these workspaces is that you can open different applications according to the requirement on different workspaces. In order to work with multiple workspaces, you can switch between these workspaces. The applications and the windows that are opened in a particular workspace remains opened until they are closed. In the simple term, Thethe workspace in the simple term lets you manage the applications on yourthe GNOME desktop when working on multiple applications simultaneously. In this section, you learn how to:

- Aadd a new workspace and
- Ttoggle between different workspaces.

Adding a New Workspace

Linux allows you to add a maximum of 36 workspaces on the desktop at the workspace switcher. Adding a new workspace lets you work with more applications in an organized way.

Let's perform the following steps to add a workspace:

1. *Right-click* the **Workspace Switcher** applet. A context menu appears (Fig.Linux-3.23).
2. *Click* the **Preferences** option, as shown in Fig.Linux-3.23:

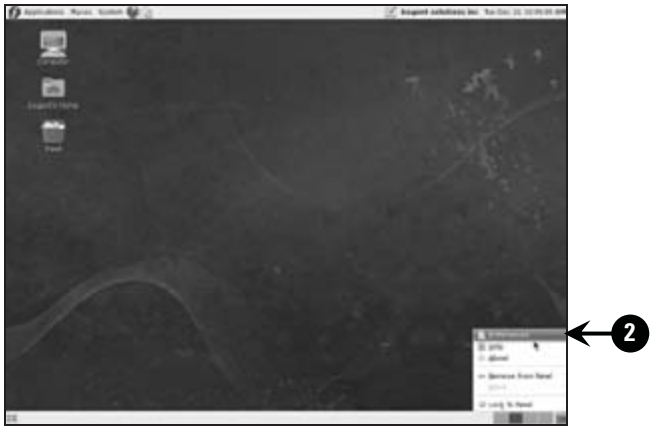


Fig.Linux-3.23

A **Workspace Switcher Preferences** dialog box appears (Fig.Linux-3.24).

3. *Click* the **Up or Down** arrow besides the **Number of Workspaces** spin box to increase or decrease the number of workspaces according to requirement. In this our case, we have selected number of workspaces to be five (Fig.Linux-3.24).
4. *Drag* the scroll-bar to see the name of workspace added in the **Workspace names** option (Fig.Linux-3.24).
5. *Click* the **Close** button (Fig.Linux-3.24).

Additional workspace can be seen in Workspace Switcher (Fig.Linux-3.25).

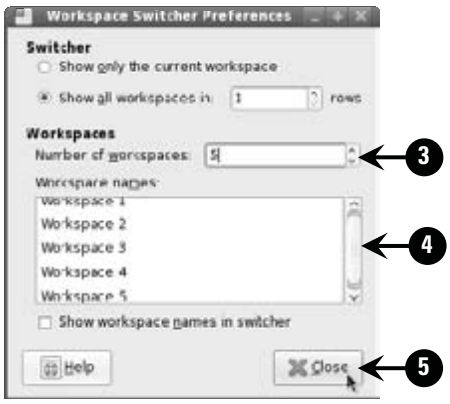


Fig.Linux-3.24

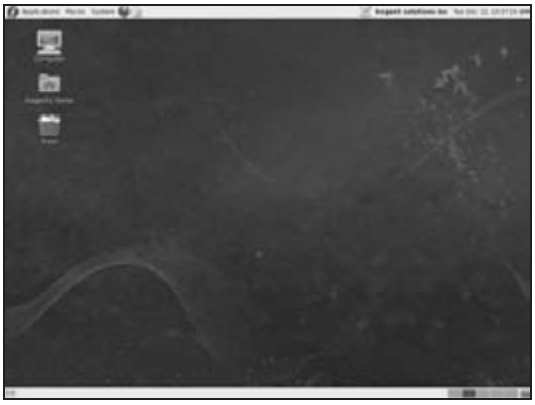


Fig.Linux-3.25

After addition adding of a new workspace, let's learn to switch between various workspaces.

Toggling between Workspaces

You can toggle between workspaces with the help of Workspace Switcher. It is an applet that lets you to switch workspaces, as and when required. Workspace Switcher applet appears at the right of the bottom panel, which. This applet is used for to representation of defined workspaces.

Let's perform the following steps to toggle (switch over) between different workspaces:

1. *Click* the desired workspace on the **Workspace Switcher** applet. In our case, we have selected the workspace 4 (Fig.Linux-3.26).

The selected workspace appears (Fig.Linux-3.27).

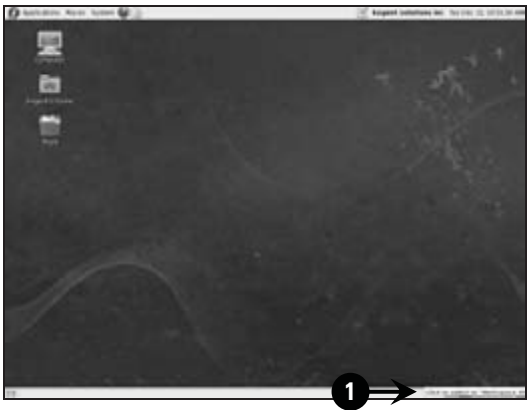


Fig.Linux-3.26

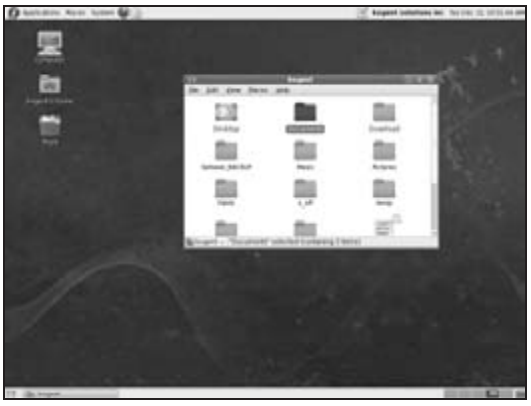


Fig.Linux-3.27



You can directly switch to the workspace on the right of the current workspace with the Ctrl+Alt+right arrow key combination. Similarly, you can directly switch to the workspace on the left of the current workspace with the Ctrl+Alt+left arrow key combination.

After exploring workspaces, let's get acquainted with the GNOME panel.

Working with the GNOME Panel

The GNOME panel is the core of the GNOME environment. By default, two GNOME panels are present in which. One one panel appears at the top of GNOME desktop environment and other at the bottom. These panels consist of menus, such as Applications, Places, and System.

In the following section, you learn to create a GNOME panel. You also learn how to, change the position of the GNOME panel. In addition you get acquaint with how, to add and remove an object from the panel. Further, you also learn to, add a drawer to the panel, that includes how to add an object to a drawer and how to enable the autohide property of a panel. In the end, you become acquainted with the steps toand delete the GNOME panel from the desktop.

Now, let's learn how to customize the panels by adding or removing an object from the panel.

Now, let's first learn abouthow to createing thea GNOME panel.

Creating a GNOME Panel

Too manyMultiple drawers and objects on the panel can make panelit cluttered and inconvenient to work with.Different objects and drawers can be placed on the panel according to the requirement. However, placing too many items on the same panel make it looks cluttered. Instead of crowding panel with multiplethese various drawers and other objects, you can create an altogether a new panel or multiple panels and customized it accor depending toon the requirement. This way, you can organize and manage your desktop items better.

Let's perform the following steps to create a panel:

1. *Right-click* the blank space on the default panel. A context-menu appears (Fig.Linux-3.28).
2. *Click* the **New Panel** option (Fig.Linux-3.28).

New panel appears on the desktop, by default. In our case, the new panel appears at the right side of the desktop (Fig.Linux-3.29).

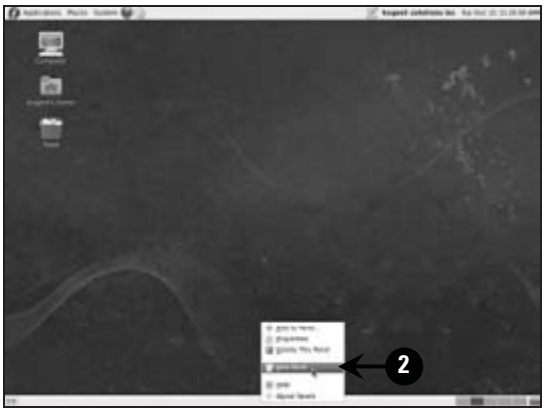


Fig.Linux-3.28

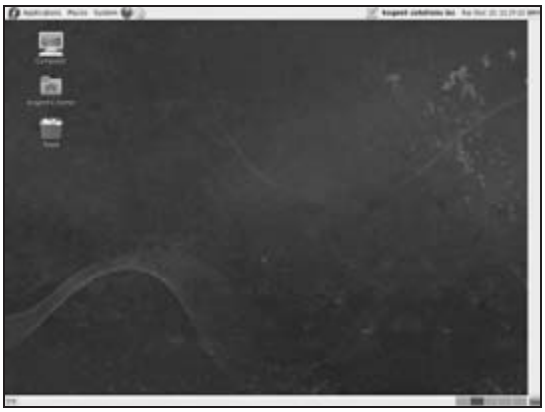


Fig.Linux-3.29

After adding a new panel, let's now learn to change its position.

Changing the Position of the GNOME Panel

You can change the position of Tthe new panel that appears on the right edge of the desktop by default. However, you can change its position as per your convenience.

Let's perform the following steps to change the default position of the panel:

1. *Right-click* the blank space on the panel of which you want to change the position. A context-menu appears (Fig.Linux-3.30).
2. *Click* the **Properties** option (Fig.Linux-3.30).

A **Panel Properties** dialog box appears (Fig.Linux-3.31).

3. *Click* the down-arrow beside the **Orientation** option. A list appears (Fig.Linux-3.31).
4. *Select* the **Left** option from the list (Fig.Linux-3.31).

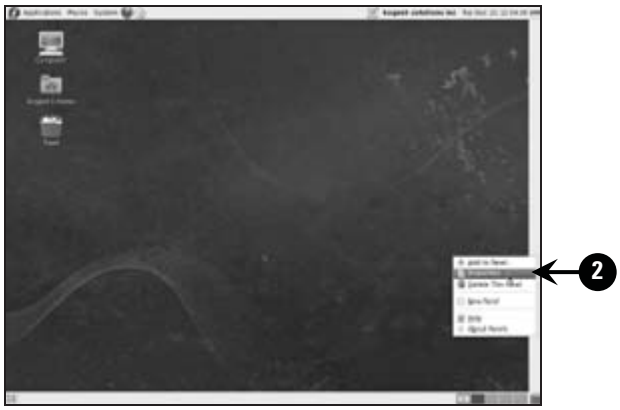


Fig.Linux-3.30

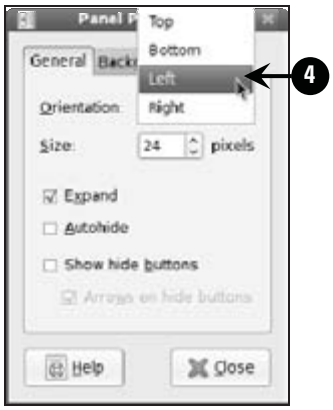


Fig.Linux-3.31

The **Left** option is selected, and it appears at the textbox beside the **Orientation** option (Fig.Linux-3.32).

5. *Click* the **Close** button to close the dialog box (Fig.Linux-3.32).

The position of the panel is changed. Now, the panel appears at the left side of the desktop (Fig.Linux-3.33).



Fig.Linux-3.32



Fig.Linux-3.33

Let's now learn how to add an object to the panel.

Adding an Object to the Top GNOME Panel

The icons of applications or programs that you access or use frequently can be placed on the panel. A shortcut icon is placed as an object on the panel to representing a particular application. These shortcut icons are used to quickly launch the application. You can add objects to any panel in similar way, in In our case, we are adding an object to the top panel.

Let’s perform the following steps to add an object to the panel:

1. *Right-click* the blank space on the panel on which you want to add an object. A context menu appears (Fig.Linux-3.34).

2. *Click* the **Add to Panel** option (Fig.Linux-3.34).

   An **Add to Panel** dialog box appears (Fig.Linux-3.35). A list of objects is displayed in the alphabetical order.

3. *Drag* the scroll-bar to select the required object (Fig.Linux-3.35).
4. *Select* the object that you want to add to the panel. In our case, we have selected the **Lock Screen** object (Fig.Linux-3.35).
5. *Click* the **Add** button (Fig.Linux-3.35).

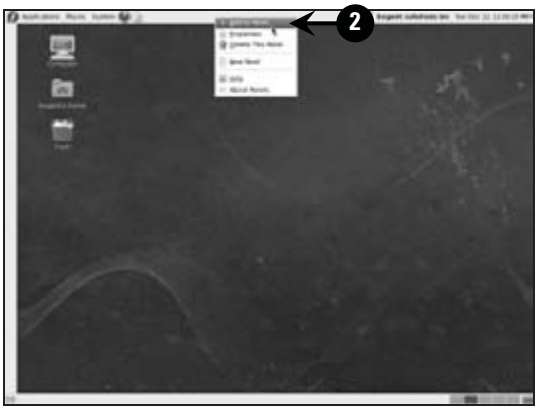


Fig.Linux-3.34



Fig.Linux-3.35

6. *Click* the **Close** button (Fig.Linux-3.36).

The object is added to the top panel (Fig.Linux-3.37).



Fig.Linux-3.36



Fig.Linux-3.37

Let's learn to remove an object from the panel.

Removing an Object from the GNOME Panel

There are applications that are not frequently accessed. The icons of these applications (which are not commonly used) can be removed from the panel.

Let's perform the following steps to remove an object from the panel:

1. *Right-click* the object icon whichthat you want to remove from the panel. A context menu appears. In our case, we have clicked the **Lock Screen** icon (Fig.Linux-3.38).
2. *Click* the **Remove from Panel** option (Fig.Linux-3.38).

The object is removed from the panel (Fig.Linux-3.39).

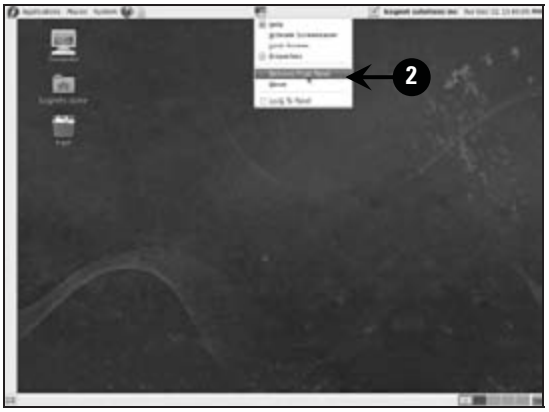


Fig.Linux-3.38



Fig.Linux-3.39

Let's now learn how to add a drawer to the panel.

Adding a Drawer to the Panel

A drawer is a container for a set of icons placed on the panel. In other words, you can create a drawer on the panel and then add a number of objects to it. Sometimes, you need to have a number of short-cut icons on the panel when you have to work with multiple applications. In such a situation, you can create one or more drawers on the panel and add a number of items to each of them. Drawers can also be used to organize some related items as a set. For example, you can organize the short cuts for all the Accessories in a drawer.

Let's perform the following steps to add a drawer:

1. *Right-click* the blank space on the panel on which you want to add an object. A context menu appears (Fig.Linux-3.34).
2. *Click* the **Add to Panel** option (Fig.Linux-3.34).

   An **Add to Panel** dialog box appears (Fig.Linux-3.40). A list of objects is displayed in the alphabetical order.
3. *Drag* the scroll-bar to select the drawer option (Fig.Linux-3.40).
4. *Select* the **Drawer** option (Fig.Linux-3.40).
5. *Click* the **Add** button (Fig.Linux-3.40).
6. *Click* the **Close** button (Fig.Linux-3.41).



Fig.Linux-3.40



Fig.Linux-3.41

The drawer is added to the top panel, as shown in Fig.Linux-3.42:



Fig.Linux-3.42

After adding a drawer to the panel, you can In the following section, you learn to add an object to a drawer, which you discuss next and how to enable the autohide property of a panel.

Let's begin with adding an object to a drawer.

Adding an Object to a Drawer

You can follow the same procedure to add objects to a drawer, as easily as you have followed done with the panel.

Let's perform the following steps to add an icon for the **Dictionary Look up** to the drawer:

1. *Right-click* the drawer icon. A context-menu appears (Fig.Linux-3.43).
2. *Click* the **Add to Drawer** option, as shown in Fig.Linux-3.43:



Fig.Linux-3.43

An **Add to Drawer** dialog box appears (Fig.Linux-3.44). A list of objects is displayed in the alphabetical order.

3. *Drag* the scroll-bar to select the desired option (Fig.Linux-3.44).
4. *Select* the **Dictionary Look up** option (Fig.Linux-3.44).
5. *Click* the **Add** button (Fig.Linux-3.44).
6. *Click* the **Close** button, to close the **Add to Drawer** dialog box (Fig.Linux-3.45).



Fig.Linux-3.44



Fig.Linux-3.45

The **Add to Drawer** dialog box gets closed, and the selected object is added to the drawer (Fig.Linux-3.46).

7. *Click* the arrow beside the Drawer icon (Fig.Linux-3.46).

   A drop-down list appears. The **Dictionary Look up** icon appears in the list (Fig.Linux-3.47)



Fig.Linux-3.46



Fig.Linux-3.47



To use the objects present in the drawer, you can double-click the icon of that specific object.

Let's now learn how to set the panel to hide temporarily.

Enabling the Autohide Property of Panel

Enabling the Autohide property hides the Panel automatically from the screen when you are not working on it. It lets you have more frèreree space on the desktop, and alsowhich helps in organizing the desktop. When, you need the Panel, you can display it again by moving the mouse-pointer to an appropriate position.

Let's perform the following steps to enable the Autohide property for the Panel:

1. *Right-click* the panel that you want to hide. A context-menu appears (Fig.Linux-3.48).
2. *Click* the **Properties** option, as shown in Fig.Linux-3.48:



Fig.Linux-3.48

A Properties dialog box appears (Fig.Linux-3.49).

3. *Select* the checkbox beside the **Autohide** option (Fig.Linux-3.49).
4. *Click* the **Close** option, as shown in Fig.Linux-3.49:

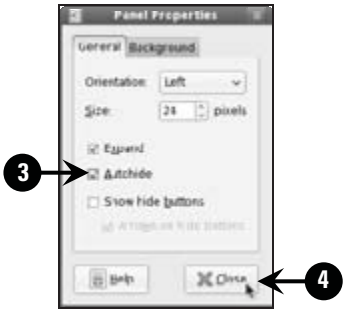


Fig.Linux-3.49

The panel gets hidden, as shown in Fig.Linux-3.50:

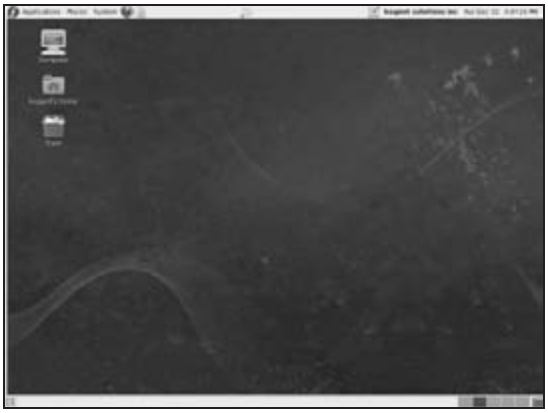


Fig.Linux-3.50



If you want to see the panel, place the mouse-pointer over the place where icon is present, the panel becomes visible.

Let's now learn how to delete a GNOME panel.

Deleting a GNOME Panel

In case whenf there isIf you do not have not any requirement of the panel, you want tocan removedelete a panel it from the desktop. You can do so by deleting it. In our case, we are deleting a panel created and moved in the preceding sections.

Let's perform the following steps to delete a panel:

1. *Right-click* the panel that you want to remove. A context-menu appears (Fig.Linux-3.51).
2. *Click* the **Delete this Panel** option, as shown in Fig.Linux-3.51:



Fig.Linux-3.51

The panel is removed, as shown in Fig.Linux-3.52:



Fig.Linux-3.52

With this, we came to an end of this chapter. Before proceeding ahead towards the next chapter, let's refresh the learning by summarizing the main points.Before ending the chapter, let's quickly recap the key points that are discussed in the preceding section.

Summary

In this chapter, you studied about the GNOME desktop and its different properties for customizing. Next, you explored components of a window and learned how to open multiple windows on the desktop. Further, you learned to work with the opened window, such as maximizing, restoring, minimizing, resizing, and moving. You also get acquaint withdiscussed how to toggle between different windows that are opened. Further, you learned to work with different workspaces and the GNOME panel. You learned how to add or remove the object at the GNOME panel and drawer. At the end, you learned how to enable the autohide property and how to delete GNOME panel.

CHAPTER



Working with Files and Directories

In this Chapter:

- Introducing Linux Files and Directory Structure
- Exploring the Terminal Window
- Describing the Basic Linux Commands
- Working with Files in Linux
- Working with Directories in Linux
- Working with Nautilus File Manager
- Working with Storage Media

This chapter describes one of the most fundamental concepts of Fedora Linux, that is, the organization of data. As you know, an operating system manages the data in files and directories. In Fedora Linux, directory refers to a special file that acts as a container for other files and directories. Other than the hard disk, data can be stored on storage media, such as a floppy disk, a zip disk, or a Compact Disk (CD). Using such types of external or removal storage media, you can create copy of the data, which you can use in the event of a system crash. The most important difference in the use of external storage between Linux and Windows is that in Windows, you simply insert a disk and start using it, whereas in Linux, you have to first mount the drive for that disk and only then can you use it.

In this chapter, you get acquainted with the Linux file and directory structure. You also explore the Terminal window as well as basic commands of Linux. You learn to perform basics tasks such as creating, copying, and removing files and directories; using a wildcard with the ls command in Linux; applying permissions on files and directories; applying sticky bit on a directory; and moving files to a directory. Apart from this, you learn to work in Nautilus File Manager, which includes creating a new folder, renaming a folder, and copying files and folders in Nautilus File Manager. In addition, you learn to take the backup of files and restore the files. Finally, you learn to work with storage media, including checking hard disk space by using the df command, exporting data to a removable media, mounting a floppy drive, accessing a CD/Digital Versatile Disc (DVD), and burn a CD.

Let's begin by discussing the structure of files and directories in Linux.

Introducing Linux Files and Directory Structure

Every operating system organizes information into files. A file refers to a stream of bits stored on a storage media, such hard disk, pen drive, and magnetic disk. These files are stored in different containers known as directories. Directories help to organize files in a computer. A set of such directories may be contained in one directory, known as a parent directory (also known the main or root directory). The directories in the parent directory are known as subdirectories. The Linux filesystem is organized a hierarchical structure, with the parent or root directory, which is located at the top of the hierarchy. The root directory is represented by a forward slash (/). Whenever you open a file in Linux, you start from the root directory to the subdirectories where the file is located. Windows follows a different structure consisting of partitions that contain the directories. The format followed in Windows is C:\Folder\subfolder\file.txt, whereas in Linux, it is /Folder/subfolder/file.txt. Linux uses forward slashes to represent the directory and file structure. In addition, there are no drives named C: or D: in Linux. When you install Linux, the root partition is mounted at the root directory (**/**)**.** Mounting refers to the process of preparing a device so that it can be used by an operating system. Files, folders, devices, and drives are mounted under **/** in Linux**.** Linux follows the Filesystem Hierarchy Standard (FHS) to define the name and location of files and directories, as shown in Fig.Linux-4.1:

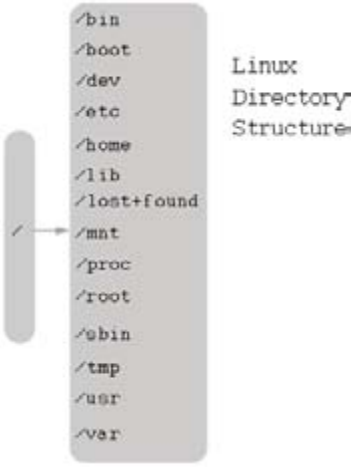


Fig.Linux-4.1

Fig.Linux-4.1 shows the directory structure in Linux, which begins with the root directory and from there, the structure branches out to subdirectories and files.

The following is a brief description of the various directories in the Linux FHS:

- **/:** Provides the home directory for users.
- **/bin**: Contains those executable files (files that are ready to run) used to boot and repair the system. This directory usually contains shells, such as bash and csh, which provide a text-based user interface for Linux, as well as commands, such as cp, mv, rm, cat, and ls.
- **/sbin:** Holds the binary executable files that are only used by the root user. This directory contains the files required to boot the system.
- **/home**: Provides the directory, which is accessible to system administrators as well as users. The /home directory stores a user's personal files, directories and programs.
- **/boot:** Allows you to boot the Linux system. This directory contains the Linux kernel, which is a core component of the Linux system.
- **/dev:** Contains those filesystem entries that represent the devices attached to the Linux system.
- **/lib**: Contains all shared libraries that are required by the programs of the Linux system.
- **/usr:** Contains all user applications, their documentation, configuration files and graphics. It also contains the source code files for the system's software. It is the largest directory on the Linux system and holds application programs, such as Terminal Network (Telnet) and File Transfer Protocol (FTP).
- **/mnt:** Refers to a mount point under which you mount filesystems or devices.
- **/var:** Contains variable data files, such as logs (**/var/log**), mail (**/var/mail**), and spools (**/var/spool**).
- **/proc:** Contains special files that are used either to extract information from or send information to the kernel. It is a special virtual directory where system processes are stored.
- **/etc:** Contains all the configuration files of the system. This directory is often used to take the backup of the Linux system. It saves you from performing the re-configuration process in case you have to re-install the Linux system.
- **/lost+found:** Allows you to recover files or data in the event of a system crash or a power failure.
- **/root:** Allows access of the home directory to a superuser. The superuser is a user who logs in with the root account.
- **/tmp:** Stores temporary files in Linux.

After learning about the structure of files and directories in Linux, let's explore the Terminal window, which is used as a command line prompt in Fedora Linux.

Exploring the Terminal Window

The Terminal window in Linux allows you to access the shell program. This program is used to interpret and execute the commands typed by a user. You need to open the Terminal window for executing any command using the Terminal window.

Perform the following steps to open the Terminal window:

1. *Select* the **Applications** menu from the top panel of the GNOME desktop. A drop-down menu appears (Fig.Linux-4.2).
2. *Place* the mouse-pointer on the **System Tools** option in the drop-down menu. A submenu appears (Fig.Linux-4.2).
3. *Select* the **Terminal** option from the submenu (Fig.Linux-4.2).

The Terminal window opens (Fig.Linux-4.3).



Fig.Linux-4.2



Fig.Linux-4.3

After learning to open the Terminal window, let's now briefly describe the basic file handling commands used in Fedora Linux.

Describing the Basic Linux Commands

Fedora Linux provides various commands to work with files and directories. You can perform different tasks by using these commands. For example, you can view a list of the files and directories installed in the system by using the ls command. Table 4.1 shows a list of commonly used file-handling commands in Linux:

Table 4.1: Basic File-Handling Commands of Linux:

Commands	Description
ls	Displays a list of files and directories of the current directory
ls -a	Displays the hidden files and directories
mkdir	Creates a directory in the system
rmdir	Removes a directory from the system
passwd	Allows you to change the system password
exit	Allows you to exit a session
man	Enables you to view the specified help page
info	Allows you to view the info pages about a Linux concept or command
cp	Enables you to copy the specified files and directories from one location to another

After knowing the basic commands of Linux, let's learn to work with files in Fedora Linux.

Working with Files in Linux

A file is a collection of data items stored on the hard disk. In Linux, programs, services, text, and images are all referred to as files. As you know, files in Linux are arranged in a hierarchical directory structure. As a system administrator, you need to perform certain operations, such as mounting and unmounting a filesystem, and managing a filesystem on various storage media, such as DVDs and CDs. Files are stored in storage media devices, such as hard disk or floppy disk.

In this section, you learn to create, copy, and remove files. In addition, you learn the use of wildcards with the **Is** command as well as set file permission in Linux.

Creating, Copying, and Removing Files in Linux

Linux provides various command line tools such as GNOME terminal, and text editors such as vi and nano, to create, copy, and remove files. You can create files in the graphical mode with the help of GNOME terminal.

Table 4.2 lists the commands used to create, copy, and remove files in Linux:

Table 4.2: Commands to Create, Copy, and Remove a File:

Commands	Purpose
Cat > filename.txt	Allows you to create a file
rm	Allows you to remove a file
cp	Allows you to copy a file

In the Linux system, the root user is the administrator of the system. The root user is assigned all the privileges required to perform administrative tasks in the system. However, before performing any administrative task, the user must switch from the user mode to the root mode.

Perform the following steps to switch from the user mode to the root mode, and then use this mode to create, copy, and remove files:

1. *Type* the **su –** command in the Terminal window (Fig.Linux-4.4).
2. *Press* the **ENTER** key. You are prompted to enter the root password (Fig.Linux-4.4).
3. *Type* the root password. The password you type is invisible (Fig.Linux-4.4).
4. *Press* the **ENTER** key to take you to the root mode (Fig.Linux-4.5).

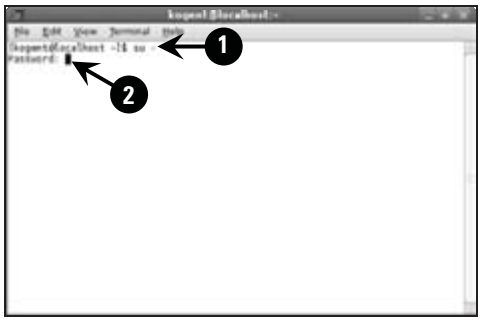


Fig.Linux-4.4



Fig.Linux-4.5

5. *Type* the **cat> filename.txt** command along with the name of a file for the new file you want to create. In our case, we have typed the name test.txt (Fig.Linux-4.6).
6. *Press* the **ENTER** key. The cursor moves to the next line, as shown in Fig.Linux-4.6:

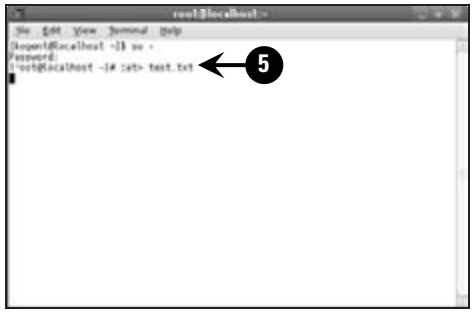


Fig.Linux-4.6

7. *Type* the desired text in the file. In our case, we have typed This is a test file text (Fig.Linux-4.7).

8. *Press* the **ENTER** key. The cursor moves to the next line (Fig.Linux-4.7).
9. *Press* the **CTRL+D** keys in combination to save the file.
   The cursor also moves to the next line (Fig.Linux-4.8).

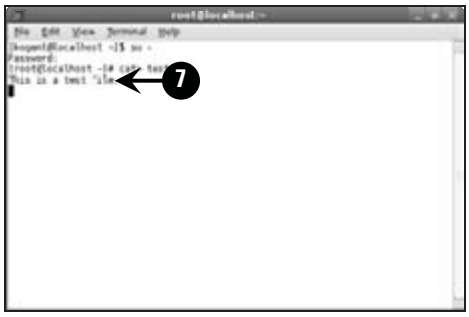


Fig.Linux-4.7

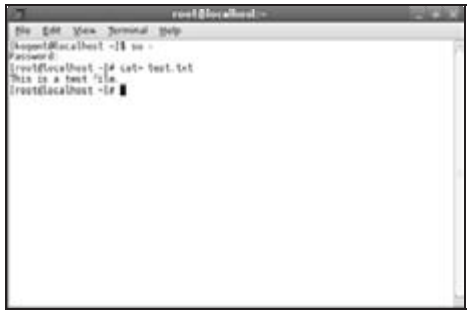


Fig.Linux-4.8

10. *Type* the **ls** command in the Terminal window to view the new file (Fig.Linux-4.9).
11. *Press* the **ENTER** key. The ls command lists all the files and directories installed in Linux (Fig.Linux-4.9).
12. *Type* the **cp test.txt /tmp** command to make a copy of the **test.txt** file in the temporary **(/tmp)** directory (Fig.Linux-4.10).
13. *Press* the **ENTER** key. The **test.txt** file is copied in the **/tmp** directory (Fig.Linux-4.10).



Fig.Linux-4.9

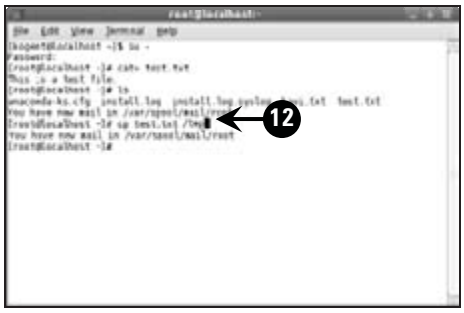


Fig.Linux-4.10

You can view the copy of the new file in the /tmp directory by typing the cp /tmp command in the Terminal window. You can also type the ls command to view a list of the subdirectories in the /tmp directories, which also includes a copy of the new file (Fig.Linux-4.11).

14. *Type* the **cd** command and then *press* the **ENTER** key to exit from the /tmp directory (Fig.Linux-4.12).



Fig.Linux-4.11



Fig.Linux-4.12

Let's now proceed to the next step to remove or delete a file.

15. *Type* the **rm filename.txt** command to remove the desired file. In our case, we have typed **test.txt** as the file name (Fig.Linux-4.13).
16. *Press* the **ENTER** key. A message appears, asking you whether you want to remove the specified file (Fig.Linux-4.13).
17. *Press* the **y** (yes) key from the keyboard to remove the specified file (Fig.Linux-4.13).
18. *Press* the **ENTER** key. The test.txt file is deleted (Fig.Linux-4.13).

Now, when you type the ls command and press the **ENTER** key, you can see that the test.txt file does not appear in the list (Fig.Linux-4.14).

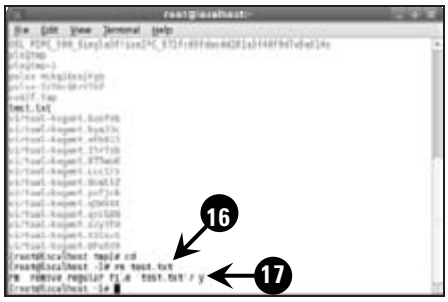


Fig.Linux-4.13



Fig.Linux-4.14

Let's now learn the use of wildcards with the ls command.

Using Wildcards with ls command

In Linux, whenever you are unsure about the name of a file or directory that you want to search but have some knowledge about filenames, then you can use wildcards. A wildcard is a special character that is used to match multiple files and directories simultaneously in a search. Three types of wildcards are used in Linux:

- * **(Asterisk):** Represents one or more characters. For example, to refer to all the files with a name starting with the character a and ending with the character g, type the wildcard expression ls a* (Fig.Linux-4.15).
- **? (Question Mark):** Represents a single character. For example, to refer to all files with six characters in which first five characters are cable and sixth may be any character, type the wildcard expression?a* (Fig.Linux-4.15).
- **[] (Square Brackets):** Represents a range of characters. For example, if you want to view a file whose name name starts with either the k or m character, or the character ranging between k and m, type the wildcard expression, **ls [k-m]*** (Fig.Linux-4.15).

Fig.Linux-4.15 shows you the use of the preceding wildcards:



Fig.Linux-4.15

After learning about wildcards, let's discuss how to set the file permission in Linux.

Describing the Linux File Permission

Linux controls the unauthorized access to files and directories by applying permissions on them. In an organizational environment where all systems are linked to one another, it is possible for a user to have access to valuable information, or read a private e-mail message. To avoid such a problem, every file and directory on Linux system belongs to an owner or a group, for which you need permission (often called a mode). In this section, you learn to list the various file permissions by using the ls command as well as change these file permissions.

Listing File Permissions

In Linux, you can list the permissions of a file by using the ls command. Each file has a set of permissions that control the kind of access that users can have to that file. The permissions for a file are also called its access mode. A file has the following permissions:

- **r (or -)** : Indicates the read permission, that is, users are permitted to read and copy a file
- **w (or -)** : Indicates write permission, that is, users are permitted to modify a file
- **x (or -)**: Indicates the execute permission, that is, users are permitted only to execute the file

Let's now learn to change file permissions.

Changing File Permissions

You can change the permissions of your files (or the files of other users if you are the root user) by using the chmod command. For example, you can provide write permissions to users by using the following command:

```
chmod g+w [filename].
```

In the preceding command, **g** represents the group of the file, **w** represents the write permission, and **+** represents the fact that the permission is added.

Perform the following steps to change the permission of a file:

1. *Select* **Applications→System Tools→Terminal** from the top panel of the GNOME desktop to open Terminal window. The window appears (Fig.Linux-4.16).



You need to type the su – command in the terminal window and then press the ENTER key to switch from the user mode to the root mode. You are prompted to enter the root password. Type the root password and press the ENTER key again to switch to the root mode.

2. *Type* the **chmod g+w** command along with name of the file whose permission you want to change. In our case, we have typed **kavi.txt** as the file name (Fig.Linux-4.16).
3. *Press* the **ENTER** key to move to the next line (Fig.Linux-4.16).

   The specified file is assigned the write permission.
4. *Type* the **ls -l** command to view the modified permission of the file. You can see that the kavi.txt file is now assigned the **rw-rw-r--** permission (Fig.Linux-4.17).

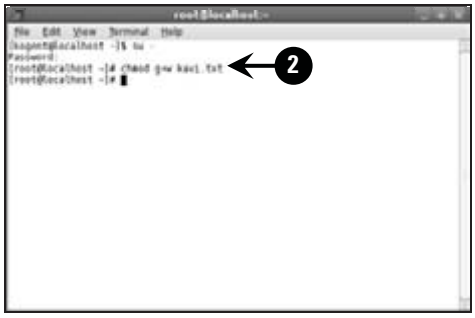


Fig.Linux-4.16

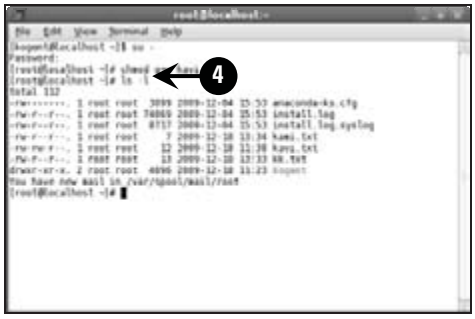


Fig.Linux-4.17

This means that the file can now be read and written only by its owner and the owner group, and can be only read by other users.

Next, you learn to change the ownership of a group as well as the ownership of a file.

Changing a File Owner or Group

You can use the chown command to change the ownership of your files, and the chgrp command to change the ownership of a group. In our case, we want to give the ownership of the kavi.txt file to the user named narayani.



A group is a collection of user accounts that are related to each other.

Perform the following steps to change the ownership of a file and a group:

1. *Type* the **chown <username> <filename>** command to change the ownership of the file. In our case, we have typed **chown narayani kavi.txt** (Fig.Linux-4.18).
2. *Press* the **ENTER** key. The ownership of the kavi.txt file is now changed and the new owner of the file is narayani (Fig.Linux-4.18).



You can the view the existing user with the help of the Users and Group option.

3. *Type* the **ls -l** command to view the owner of the kavi.txt file (Fig.Linux-4.18).
4. Type chgrp <groupname> <filename> to add the file to a group. In our case, we have typed chgrp tina kavi.txt, to add the kavi.txt file to the tina group (Fig.Linux-4.19).
5. *Press* the **ENTER** key (Fig.Linux-4.19). The specified file is added to the tina group.
6. *Type* the **ls -l** command and view the kavi.txt file in the tina group (Fig.Linux-4.19).

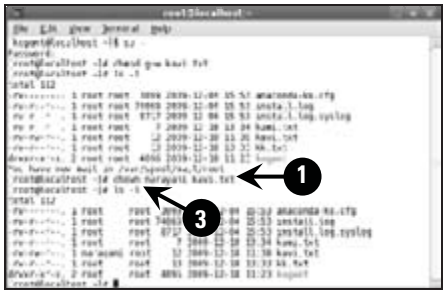


Fig.Linux-4.18

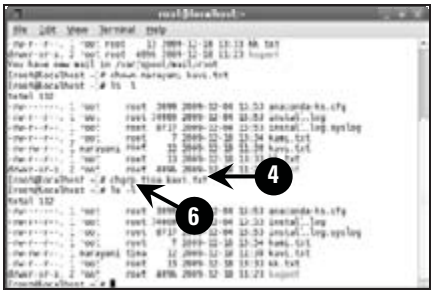


Fig.Linux-4.19

After knowing how to work with files in Linux, let's learn to work with directories in Linux.

Working with Directories in Linux

As stated earlier, a Linux directory is a special file that acts as a container for other files and directories. You can create directories to hold groups of related files as an alternative to keeping all the files in one large directory. You are already familiar with the structure of files and directories in Linux (Fig.Linux-4.1). In this section, you learn to perform the following tasks with regard to directories in Linux:

- Create and remove directories
- Apply permissions on a directory
- Set a group ID on a directory
- Apply a sticking bit on a directory
- Apply umask settings
- Move files to a directory
- Create a backup and restore files

Let's discuss these tasks one by one in the following sections.

Creating and Removing a Directory in Linux

You can create a directory in Linux by using the mkdir command, remove a directory by using the rmdir command, and change the name of a directory by using the mv command. You can also change a directory type by using the cd command. This command enables you to switch from the one directory to another. The pwd command provides you the location of the directory you are currently working in.

Directories appear in the blue and files appear in black in the terminal window.

Table 4.3 shows a list of the directory-related commands:

Table 4.3: Directory-Related Commands in Linux

Commands	Description
mkdir	Let's you create a new directory. To do this, type mkdir followed by the name of a directory. For example, type mkdir test to create the directory named test.
rmdir	Enables you to remove or delete a directory. To do this, type rmdir followed by the directory's name. For example, type rmdir test to delete the directory named test.
cd	Enables you to switch from one directory to another directory. For example, type cd kavya to switch to kavya's directory. Remember that the directory you are switching to must exist in your system; otherwise, this command will not execute.
pwd	Provides you the location of the directory you are working in.
mv	Enables you to change the name of a directory. To use this command, type mv followed by the name of the directory you want to change, followed by the new name. For example, type mv test kavyadir to change the directory named test to the name kavyadir.

Perform the following steps to create and remove a directory:

1. *Type* the **mkdir <name>** command to create a directory. In our case, we have typed the **mkdir kavya** command (Fig.Linux-4.20).
2. *Press* the **ENTER** key (Fig.Linux-4.20). The kavya directory is created, and the cursor moves to the next line.
3. *Type* the **ls** command and press the **ENTER** key. You can see the newly created directory (Fig.Linux-4.20).

   Let's proceed to the next step to remove a directory.
4. *Type* the **rmdir <directory name>** command to remove a directory. In our case, we have typed the **rmdir kavya** as the name of the directory (Fig.Linux-4.21).
5. *Press* the **ENTER** key (Fig.Linux-4.21). The specified directory is removed.
6. *Type* the **ls** command and *press* the **ENTER** key. You can see that the specified directory is deleted (Fig.Linux-4.21).

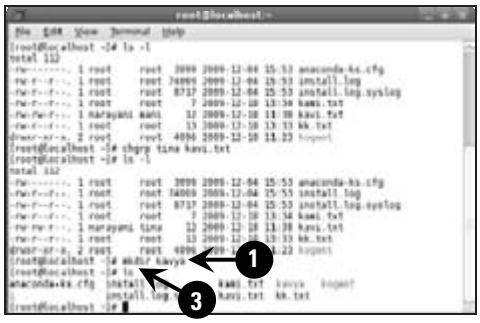


Fig.Linux-4.20

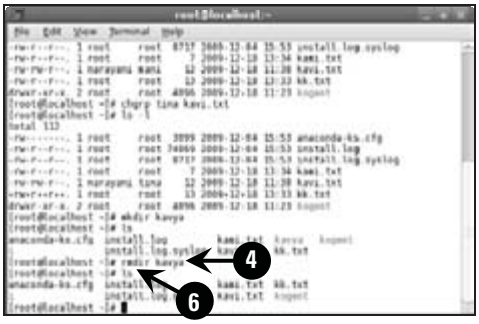


Fig.Linux-4.21

Let's now learn to apply permissions on a directory.

Applying Permissions on a Directory

You can also assign permissions to directories. You can assign three types of permissions to a directory: read, write, and execute. The read permission displays the list of files available in the directory, the write permission enables you to change the content of a file and the execute permission enables you access the files in a directory. When you create a directory, you have the read, write, and execute permissions by virtue of being the owner of the directory. Apart from the types of permissions already discussed, you can also apply other permissions such as the set group identifier (SGID) and sticky bit on a directory.

The following are the three types of permissions that you can apply to a directory:

- **r :** Allows you to view a list of all the files in a directory
- **w :** Allows you to change the content of the files from a directory.
- **x :** Provides the permission to access the files in a directory

You can view the permission applied to a directory by using the **ls -l** command. Suppose you want to view the permissions applied on a directory (For example, the kogent directory in our case), type the ls –l command in the terminal window and press the ENTER key. The following output is displayed on the Terminal window:

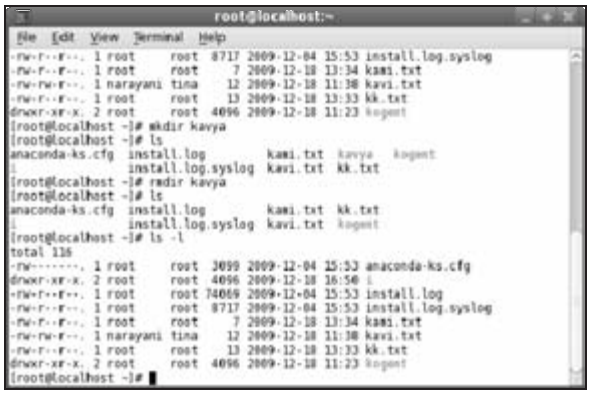


Fig.Linux-4.22

Let's now learn to set the SGID permission on a directory.

Setting a Group ID (SGID)on a Directory

The group ID (GID) is the unique identifier that is applied on groups in Linux. Both users and files are assigned GIDs to determine permission and access control. You can also assign the SGID permission on a directory by using the chmod g+s command. This permission enables the new files and subdirectories created in the root directory to inherit the ID of their group, instead of the primary group ID.



Setting the SGID permission on a directory only affects the group ID of new files and subdirectories that are created after the SGID permission is applied.

Perform the following steps to set the SGID permission on a directory:

1. *Type* the **chmod g+s** command followed by a directory name to set the SGID permission for the directory. In our case, the name of the directory is **kogent** (Fig.Linux-4.23).
2. *Press* the **ENTER** key. The SGID permission is applied on the selected directory.
3. *Type* the **ls -l** command and *press* the **ENTER** key. The SGID permission is applied on the kogent directory, as shown in Fig.Linux-4.23:

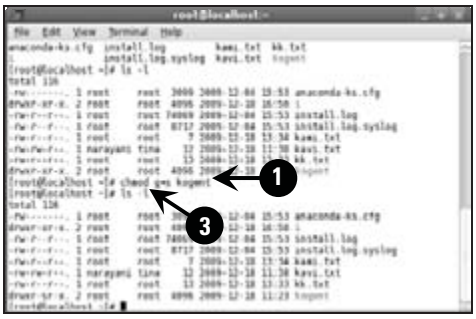


Fig.Linux-4.23

When you set the SGID permission on a directory, the permission is denoted by the letter s, which replaces the letter x in the list of permissions in the Terminal window (Fig.Linux-4.23).

Let's now learn to apply a sticky bit on a directory.

Applying a Sticking Bit on a Directory

Sticky bit is a special permission used to provide security to directories. The sticky bit permission prevents users from deleting the directory files of other users even though they may have full access to the directory. Only the root user or owner of the directory can delete or rename files in the directory that has the sticky bit permission set on it. The sticky bit is denoted by the letter **t** and appears at the end of the permission for the specified file (Fig.Linux-4.24).

The sticky bit permission is set on the /tmp directory by default and can be seen as a t in the file permission.

You can apply the sticky bit permission on a directory by typing the chmod o+t command followed by the directory name.

Perform the following steps to apply a sticking bit permission on a directory:

1. *Type* the **chmod o+t** command followed by the name of the directory on which you want to apply the sticky bit permission. In our case, we have applied the sticky bit permission on the **kogent** directory (Fig.Linux-4.24).
2. *Press* the **ENTER** key.

   The sticky bit permission is applied on the specified file.
3. *Type* the **ls -l** command and *press* the **ENTER** key. A list of files and directories appears along with the permission applied on them. You can see that the kogent directory is highlighted in blue, which means that the sticky bit permission has been applied on it, as shown in Fig.Linux-4.24:

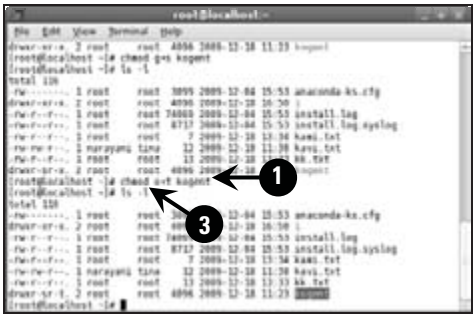


Fig.Linux-4.24

Let's now learn to apply the umask settings.

Applying the Umask Settings

Umask settings are applied to view or change the default permission of newly created files in Linux. It has a set of default permissions, such as read, write, and execute, for executable files and text files. The default umask value is 022.



By default, files with an umask value of 000 get the mode 666 and directories get the mode 777. As a result, if the default umask value is 022, the newly created files get a default mode of 644 (666 - 022 = 644) and directories get a default mode of 755 (777 - 022 = 755).

Perform the following steps to apply the umask settings on a directory:

1. *Type* the **umask 027** command followed by the directory name. In our case, we have typed **umask 027 kogent** (Fig.Linux-4.25).
2. *Press* the **ENTER** key. The umask settings are applied to the specified directory.
3. *Type* the **ls -l** command and *press* the **ENTER** key. The umask settings applied on the kogent directory are listed on the Terminal window (Fig.Linux-4.25).
4. *Click* the **Close Window** to close the **Terminal** window, as shown in Fig.Linux-4.25:

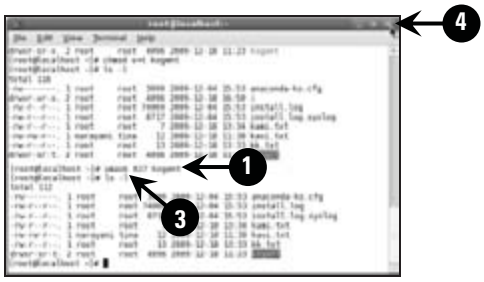


Fig.Linux-4.25

Let's now learn how to move files to a directory.

Moving Files to a Directory

Moving a file or directory means deleting it from its original location and placing it in other directory. When you move a file to a directory and run the ls command, only the name of the directory appears in the Terminal window, and not the name of the file you moved. This provides security to the files in a directory. You can move files to a directory with the help of the mv [filename] command.

Perform the following steps to move files to a directory:

1. *Type* **mv [file name] [directory name]**. In our case, we have typed **mvkk.txt kogent** to move the kk.txt name file to the kogent directory (Fig.Linux-4.26).
2. *Press* the **ENTER** key.

The kk.txt file is moved to the kogent directory, as shown in Fig.Linux-4.26:

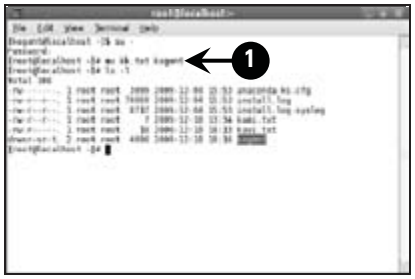


Fig.Linux-4.26

Next, let's learn to take the backup of files as well as restore files in Linux.

Backing up and Restoring Files

Backing up data is the process of making additional copies of data so that the copies can be used to restore the original data in the event of data loss. These additional copies are typically called backups. Taking regular backups is the responsibility of the system administrator. Backups also help you to restore data as well as the files that have been accidentally deleted or corrupted. You can take the backup of files and restore the files by using archiver (tar), which that is a built-in program in Linux. You can take the backup in CDs as well.

In Linux, you can restore the backup of data from the dump, which refers to the location where the backup data is to be stored. The backup of the files are copied to a specified disk, or other storage media. To restore the backup data, create a clean filesystem (by using the make filesystem (mkfs) command) and mount the filesystem.

Perform the following steps to take the backup of a file and then restore the file:

1. *Click* the **System** menu from the top panel of the GNOME desktop. A drop-down menu appears (Fig.Linux-4.27).
2. *Select* the **Administration** option from the drop-down menu. A submenu appears (Fig.Linux-4.27).
3. *Select* the **Simple Backup Config** option from the submenu, as shown in Fig.Linux-4.27:

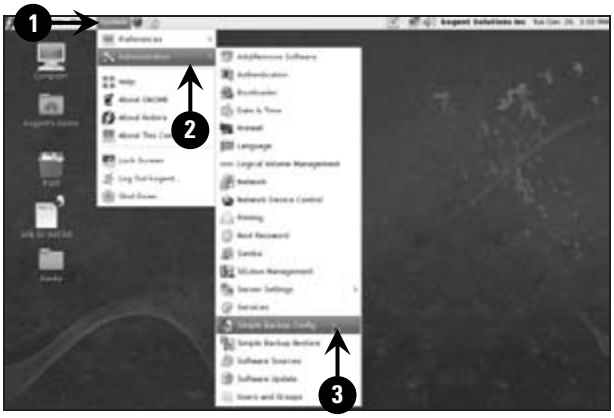


Fig.Linux-4.27

As you are logged in with the user account, you are provided administrative privileges. When you select the **Simple Backup Config** option, the Query dialog box appears, asking you for more information about the administrative privileges. You are required to authenticate yourself in the root mode by typing its password (Fig.Linux-4.28).

4. *Type* the root password in the **Password** text box, to use the administrative privileges (Fig.Linux-4.28).
5. *Click* the **OK** button, as shown in Fig.Linux-4.28:

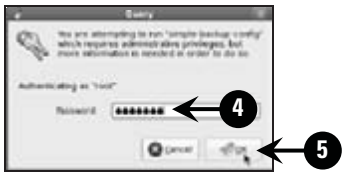


Fig.Linux-4.28

The **Backup Properties** dialog box appears, with the **General** tab open and the **Use recommended backup settings** radio button selected by default (Fig.Linux-4.29).

6. *Select* the **Use custom backup settings** radio button (Fig.Linux-4.30).



Fig.Linux-4.29



Fig.Linux-4.30

7. *Select* the **Include** tab of the **Backup Properties** dialog box (Fig.Linux-4.31).

   The Include page opens, displaying four directories by default: **/var/, /home/, /usr/local/, and /etc/** (Fig.Linux-4.31).

8. *Click* the **Add Directory** button to add the directory whose backup you want to take (Fig.Linux-4.31).

   The **Include folder** dialog box appears (Fig.Linux-4.32).

9. *Select* the folder(s) that you want to include in your backup. In our case, we have selected the **Documents** folder (Fig.Linux-4.32).

10. *Click* the **Open** button (Fig.Linux-4.32).

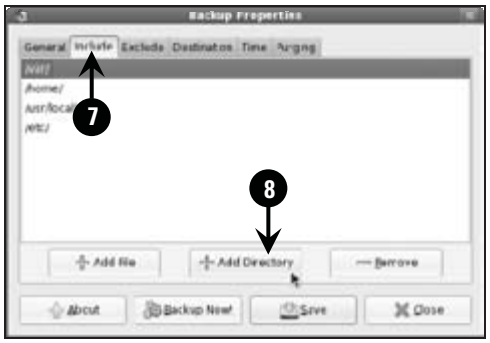


Fig.Linux-4.31



Fig.Linux-4.32

The selected folder is added under the Include page of the **Backup Properties** dialog box (Fig.Linux-4.33).

11. *Select* the **Destination** tab (Fig.Linux-4.33).

    The Destination page opens, displaying the **Use default backup directory (/var/backup)** radio button selected by default (Fig.Linux-4.34).

12. *Select* the **Use custom local backup directory** radio button in the **Destination** tab (Fig.Linux-4.34).



Fig.Linux-4.33



Fig.Linux-4.34

13. *Click* the down arrow in the list box under the **Use custom local backup directory** radio button (Fig.Linux-4.34). A list of destination folders appears (Fig.Linux-4.35).
14. *Select* the desired location for the backup destination from the list. In our case, we have retained the default location, that is, **kogent**, as shown in Fig.Linux-4.35:

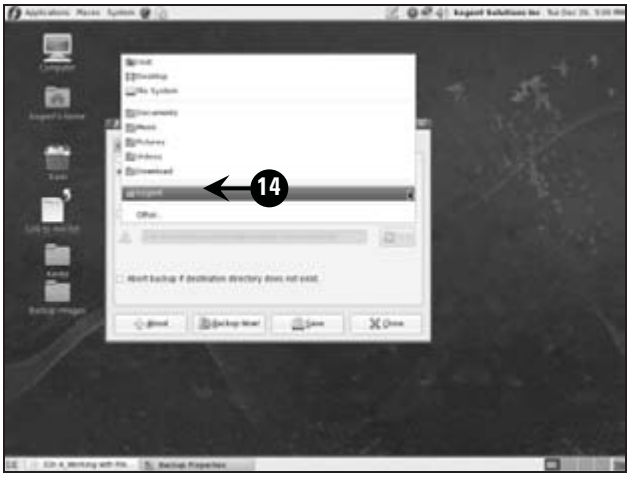


Fig.Linux-4.35

15. *Select* the **Time** tab in the Backup Properties dialog box (Fig.Linux-4.36).
    The Time tab opens (Fig.Linux-4.37).
16. *Click* the **Do backups** list box and *select* the desired backup option from the drop-down list. In our case, we have selected the **custom** option (Fig.Linux-4.37).



Fig.Linux-4.36



Fig.Linux-4.37

17. *Select* the **Purging** tab in the **Backup Properties** dialog box, as shown in Fig.Linux-4.38:



Fig.Linux-4.38

The **Purging** tab opens (Fig.Linux-4.39). The options under this tab allow you to delete the older backup files and directories. In our case, we have taken the default settings.

18. *Click* the **Save** button at the bottom of the Backup Properties dialog box (Fig.Linux-4.39).

    A message box appears indicating the message: Configuration save successful (Fig.Linux-4.40).

19. *Click* the **Close** button (Fig.Linux-4.40).



Fig.Linux-4.39

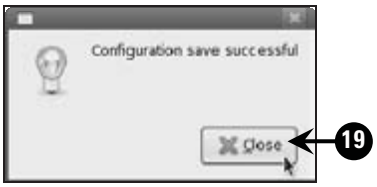


Fig.Linux-4.40

20. *Click* the **Backup Now!** button in the Backup Properties dialog box to take the backup of the kogent folder (Fig.Linux-4.41).

    As you click the **Backup Now!** button, a message box appears informing you that the backup process has started in the background (Fig.Linux-4.42).

21. *Click* the **Close** button to close this message box (Fig.Linux-4.42).



Fig.Linux-4.41



Fig.Linux-4.42

22. *Double-click* the **kogent's Home** folder on the GNOME desktop to view the created backup, as shown in Fig.Linux-4.43:



Fig.Linux-4.43

Now that you know how to take a backup of data, let's now learn to restore that data whose backup has been taken.

Perform the following steps to restore a backup:

1. *Click* the **System** menu from the top panel of the GNOME desktop. A drop-down menu appears (Fig.Linux-4.44).
2. *Select* the **Administration** option from the drop-down menu. A submenu appears (Fig.Linux-4.44).
3. *Select* the **Simple Backup Restore** option from the submenu, as shown in Fig.Linux-4.44:

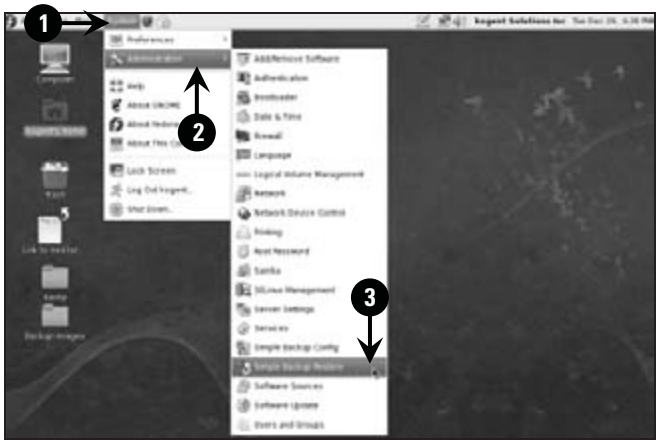


Fig.Linux-4.44

Again, you are asked to enter the root password in the **Query** dialog box (Fig.Linux-4.28).

4. *Type* the root password in the **Password** text box, to use the administrative privileges (Fig.Linux-4.28).
5. *Click* the **OK** button (Fig.Linux-4.28).

   The **Restore file/directories** window appears (Fig.Linux-4.45).
6. *Select* the **Use custom** radio button. The Use custom browser is highlighted (Fig.Linux-4.46).
7. *Click* the **Browser** beside the Use custom option (Fig.Linux-4.46).



Fig.Linux-4.45



Fig.Linux-4. 46

The **Choose a source folder** dialog box appears (Fig.Linux-4.47).

8. *Select* the folder that you want to restore (Fig.Linux-4.47).



The name of the selected folder is 2009-12-29_17.46.00.227705.localhostlocaldomain.ful.

9. *Click* the **Open** button (Fig.Linux-4.47).
   The selected source folder is added beside the Use custom radio button (Fig.Linux-4.48).
10. *Click* the down arrow button beside the **Available backups** list box. A list of available backups appears (Fig.Linux-4.48).
11. *Select* the backup that you want to restore (Fig.Linux-4.48).



Fig.Linux-4.47

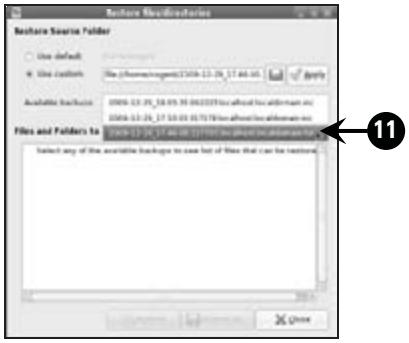


Fig.Linux-4.48

The backup files and folders appear in the Restore files/directories dialog box under the **Files and Folders to restore** list box (Fig.Linux-4.49).

12. *Select* the directory that you want to restore. In our case, we have selected the **etc** directory (Fig.Linux-4.50).
13. *Click* the **Restore** button (Fig.Linux-4.50).



Fig.Linux-4.49

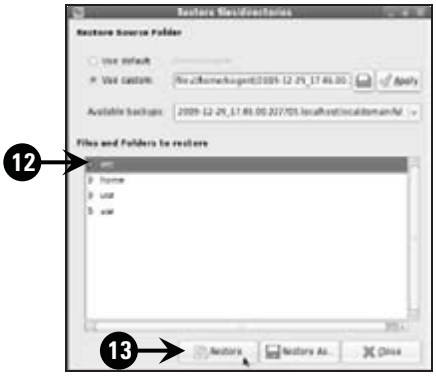


Fig.Linux-4.50

As you click the **Restore** button, a dialog box appears, informing you that the restoration process has begun, and that this might take some time, as shown in Fig.Linux-4.51:



Fig.Linux-4.51

After getting familiar with the backup and restore procedures in Linux, we move to another important feature of Linux: Nautilus File Manager.

Working with Nautilus File Manager

Any folder, file, or directory you open in the GNOME desktop, automatically opens in a window known as Nautilus File Manager. This application comes built-in with Fedora Linux for GNOME, and helps you to access and control information in the form of files, folders and directories easily and efficiently. Nautilus File Manager also helps to open a file using a particular application. In this section, you learn to work with Nautilus File Manager. Let's first create a new folder buy using Nautilus File Manager

Creating a New Folder

You can easily create a new folder to store information by using Nautilus File Manager.

Perform the following steps to create a new folder using Nautilus File Manager:

1. *Double-click* the home folder icon in the GNOME desktop. In our case, we have taken the **kogent's Home** folder, as shown in Fig.Linux-4.52:



Fig.Linux-4.52

The **kogent's Home** folder opens in the Nautilus File Manager window (Fig.Linux-4.53).

2. *Click* the **File** menu in the kogent Nautilus File Manager window. A drop-down menu appears (Fig.Linux-4.53).
3. *Select* the **Create Folder** option from the drop-down menu (Fig.Linux-4.53).
4. *Press* the ENTER key from the keyboard.

A new folder named **untitled folder** is created in the kogent Nautilus File Manager window (Fig.Linux-4.54).



Fig.Linux-4.53

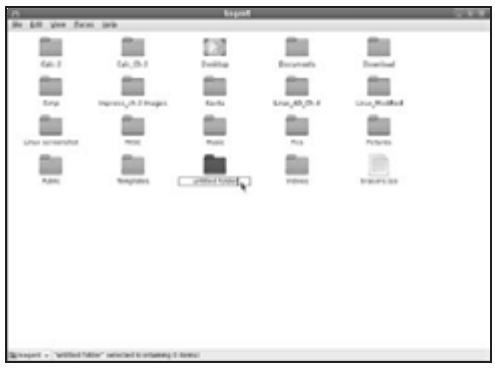


Fig.Linux-4.54

After creating a new folder, let's rename the folder.

Renaming a Folder

You can also change the name of a file or folder that you have created by using Nautilus File Manager.

Perform the following steps to rename a folder:

1. *Select* the folder you want to rename. In our case, we have selected the **untitled folder** (Fig.Linux-4.55).
2. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.55).
3. *Select* the **Rename** option from the drop-down menu (Fig.Linux-4.55).
4. *Type* the desired name for the untitled folder. In our case, we have typed **Network** as the name of the folder (Fig.Linux-4.56).



Fig.Linux-4.55



Fig.Linux-4.56

The untitled folder is renamed as Network.

Let's now learn how to copy files into a folder.

Copying Files into a Folder

You can add files to a folder by two methods, either by creating a new file in an application and saving the file in a folder, or by copying files from other folders into the folder. In this section, you learn to copy a file into the Documents folder.

Perform the following steps to copy a file into a folder:

1. *Select* the files that you want to copy. In our case, we have selected the **brasero.iso** file (Fig.Linux-4.57).
2. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.57).
3. *Select* the **Copy** option from the drop-down menu, as shown in Fig.Linux-4.57:

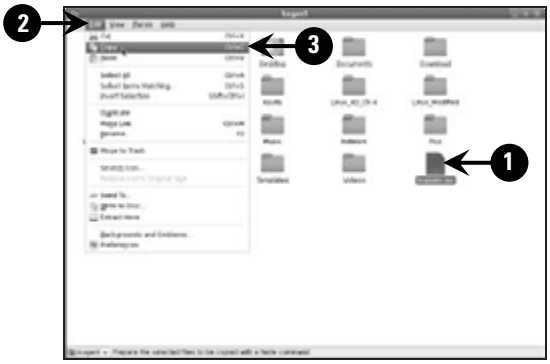


Fig.Linux-4.57

You now need to open a folder in which you want to want to paste the file. In our case, we have opened the **Network** folder.

4. *Click* the **Edit** menu in the Network window. A drop-down menu appears (Fig.Linux-4.58).
5. *Select* the **Paste** option from the drop-down menu (Fig.Linux-4.58).

The selected file (**brasero.iso**) is copied in the Network folder (Fig.Linux-4.59).



Fig.Linux-4.58



Fig.Linux-4.59

Let's now learn to move files and directories from one location to another location by using Nautilus File Manager.

Moving Files and Directories

Moving refers to the removing of files or directories from one folder and placing them in some other folder.

Perform the following steps to move a file and a directory:

1. *Select* the file that you want to move. In our case, we want to move the **brasaro.iso** file located in the kogent folder (Fig.Linux-4.60).
2. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.60).
3. *Select* the **Cut** option from the drop-down menu (Fig.Linux-4.60).

   You can now paste the file at any location of your choice. In our case, we have selected the Documents folder. For this, you need to click the Documents folder in the home window (In our case, the home window is **kogent**). The Documents folder opens in the Nautilus File Manager window (Fig.Linux-4.61).
4. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.61).
5. *Select* the **Paste** option from the drop-down menu (Fig.Linux-4.61).

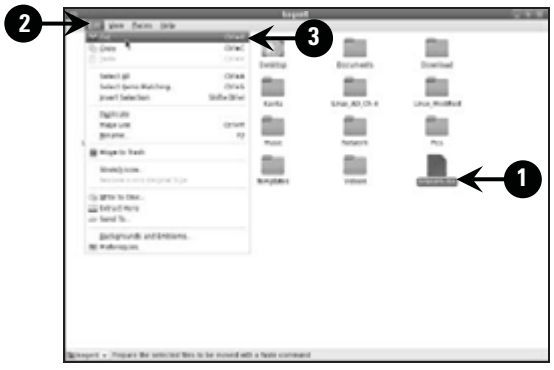


Fig.Linux-4.60

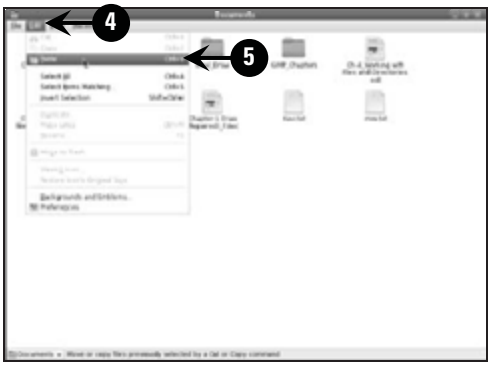


Fig.Linux-4.61

The selected file moves from its original location and appears in the Documents folder (Fig.Linux-4.62).

After moving a file, let's learn to move a directory. For that, proceed to the next step.

6. *Select* the directory that you want to move. In our case, we have selected the **Templates** directory (Fig.Linux-4.63).
7. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.63).
8. *Select* the **Cut** option from the drop-down menu (Fig.Linux-4.63).



Fig.Linux-4.62



Fig.Linux-4.63

9. *Double-click* the **Documents** folder to open the folder (Fig.Linux-4.63).
10. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.64).
11. *Select* the **Paste** option from the drop-down menu (Fig.Linux-4.64).

The selected directory is pasted in the Documents folder of the Nautilus File Manager window (Fig.Linux-4.65).



Fig.Linux-4.64



Fig.Linux-4.65

Next let's learn to create a link for a file or directory.

Creating a Link for a File or a Directory

Creating links a file or directory enables you to open the file or directory from a location other than its original location.

Perform the following steps to create a link for a file or directory:

1. *Select* the file or directory whose link you want to create. In our case, we have selected the **mini.txt** file in the **Documents** folder, displayed on the Nautilus File Manager window (Fig.Linux-4.66).
2. *Click* the **Edit** menu in the Nautilus File Manager window. A drop-down menu appears (Fig.Linux-4.66).

3. *Select* the **Make Link** option from the drop-down menu (Fig.Linux-4.66).

   A link for the mini.txt file is created of the selected file is created in the Nautilus File Manager window (Fig.Linux-4.67).



Fig.Linux-4.66



Fig.Linux-4.67

4. *Position* the mouse pointer on the top right corner of the Nautilus File Manager window (Fig.Linux-4.68).
5. *Drag* the mouse pointer to reduce the size of the Nautilus File Manager window. When it is sufficiently reduced and the GNOME desktop is visible, release the mouse button (Fig.Linux-4.68).
6. *Position* the mouse pointer on the **Link to mini.txt** icon, in the Nautilus File Manager window (Fig.Linux-4.69).
7. *Drag* the mouse pointer. As you drag the mouse pointer, a shadow of the link also moves along with the mouse pointer (Fig.Linux-4.69).



Fig.Linux-4.68

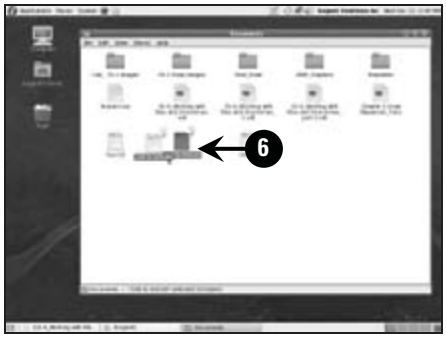


Fig.Linux-4.69

8. *Release* the mouse button when the mouse pointer is on the desktop. The link is copied on the desktop, as shown in Fig.Linux-4.70:



Fig.Linux-4.70



You can also create a link for a directory by following the preceding steps.

Let's now learn to open a file.

Opening a File

You can open and work in a file only if you have the required permissions for file. All files and folders in Linux are accessible to the root user. If you are not logged in as a root user, you can access only those files for which you the required permission.

Perform the following steps to open a file:

1. *Select* the file you want to open, in the Nautilus File Manager window. In our case, we have selected the **mini.txt** file (Fig.Linux-4.71).
2. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.71).
3. *Select* the **Open with "Text Editor"** option from the drop-down menu (Fig.Linux-4.71).
   The mini.txt file opens in the **gedit** text editor (Fig.Linux-4.72).
4. *Click* the **Close** button of the **gedit** text editor window to close the window (Fig.Linux-4.72).



Fig.Linux-4.71

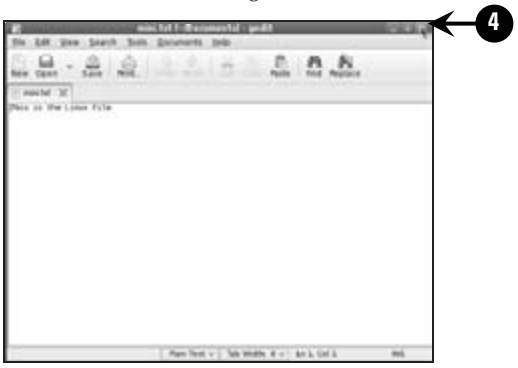


Fig.Linux-4.72

After learning to open a file, let's now learn to open a file with an application.

Opening a File with an Application

As you already know, Nautilus File Manager allows you to open a file with a particular text editor. Let's now learn to open a file with an application called **KWrite**. This is a Graphical User Interface (GUI) text editor, which is generally used for programs and plain text files.

Perform the following steps to open a file with an application:

1. *Select* the file in the Nautilus File Manager window that you want to open with an application. In our case, we have selected the **mini.txt** file (Fig.Linux-4.73).
2. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.73).
3. *Select* the **Open with** option from the drop-down menu. A submenu appears (Fig.Linux-4.73).
4. *Select* the **Open with KWrite** option from the submenu (Fig.Linux-4.73).
   The selected file opens with the KWrite text editor (Fig.Linux-4.74).
5. *Click* the **Close** button from the KWrite window to close the window (Fig.Linux-4.74).



Fig.Linux-4.73

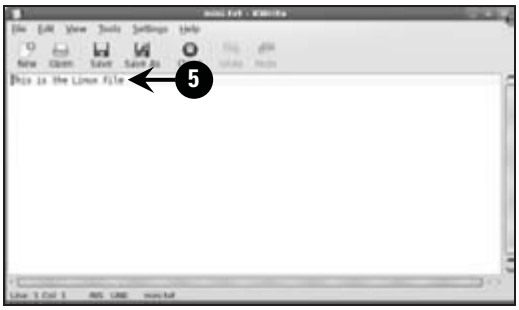


Fig.Linux-4.74

Let's now learn to view the properties of a file.

Displaying the Properties of a File

You can view the properties of a file to get additional information about the file other than its content, such as the date when the file was last modified, and the size of the file.

Perform the following steps to view the properties of file:

1. *Select* a file whose properties you want to view. In our case, we have selected the **mini.txt** file (Fig.Linux-4.75).
2. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.76).
3. *Select* the **Properties** option from the drop-down menu (Fig.Linux-4.76).



Fig.Linux-4.75

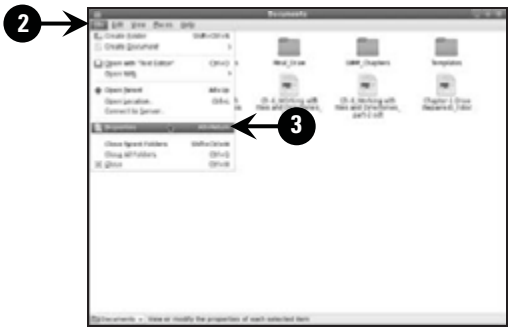


Fig.Linux-4.76

The mini.txt Properties dialog box appears (Fig.Linux-4.77). As you can see, the Properties dialog box of the selected file displays information such as the name, type, and size of the file.

4. *Click* the **Close** button to close the Properties dialog box, as shown in Fig.Linux-4.77:

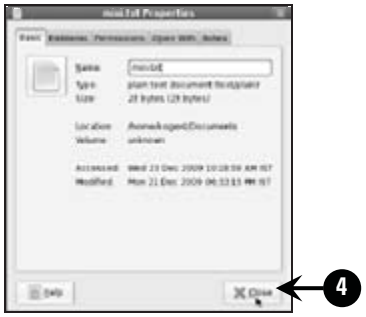


Fig.Linux-4.77

Let's now learn to view the permissions of a file.

Viewing the Permissions of a File

The Properties dialog box of a file allows you to view the permissions of the file. If you are the owner of the file, or have logged in as the root user, you can also change the permissions for the file by using this dialog box.

Perform the following steps to view the permissions of a file:

1. *Select* a file whose properties you want to view. In our case, we have selected the **mini.txt** file (Fig.Linux-4.75).
2. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.76).
3. *Select* the **Properties** option from the drop-down menu (Fig.Linux-4.76).
   The mini.txt Properties dialog box appears (Fig.Linux-4.78).
4. *Click* the **Permissions** tab in the **mini.txt Properties** dialog box (Fig.Linux-4.78).
   The permissions for the file mini.txt are displayed in the **Properties** dialog box (Fig.Linux-4.79).
5. *Click* the **Close** button of the **Properties** dialog box to close the dialog box (Fig.Linux-4.79).



Fig.Linux-4.78



Fig.Linux-4.79

The Documents window appears, as shown in Fig.Linux-4.80:



Fig.Linux-4.80

Let's now learn to delete a file

Deleting a File

You can delete files from your system that you no longer need. This allows you to free hard disk space, which can be used to store other files.

Perform the following steps to delete a file:

1. *Select* the file that you want to delete. In our case, we have selected the **kavi.txt** file (Fig.Linux-4.81).
2. *Click* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.81).
3. *Select* the **Move to Trash** option from the drop-down menu (Fig.Linux-4.81).

The selected file kavi.txt is deleted from the Nautilus File Manager window (Fig.Linux-4.82).



Fig.Linux-4.81



Fig.Linux-4.82

The file you delete move to the Trash folder. You can still recover the file from the Trash folder if it is required. However, you can also permanently delete a file, as we are going to find out in the next section.

Deleting a File Permanently

When you delete a file, it is removed from its original location and stored in the Trash folder located on the desktop. The Trash folder stores all the files that have been deleted. To remove a file permanently from your system, you need to delete it from the Trash folder.

Perform the following steps to delete a file permanently:

1. *Double-click* the **Trash** folder located on the desktop (Fig.Linux-4.83).
   The Trash window opens (Fig.Linux-4.84).
2. *Select* the file that you want to delete permanently. In our case, we have selected the **kavi.txt** file (Fig.Linux-4.84).
3. *Right-click* the selected file. A context menu appears (Fig.Linux-4.84).
4. *Select* the **Delete Permanently** option from the context menu (Fig.Linux-4.84).



Fig.Linux-4.83

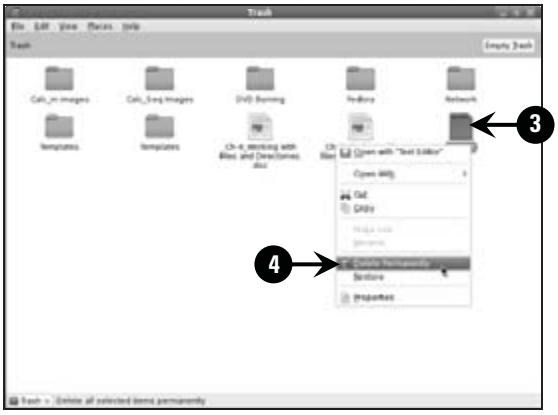


Fig.Linux-4.84

A message box appears, asking you to confirm the deletion (Fig.Linux-4.85).

5. *Click* the **Delete** button (Fig.Linux-4.85).
   The selected file is permanently deleted (Fig.Linux-4.86).

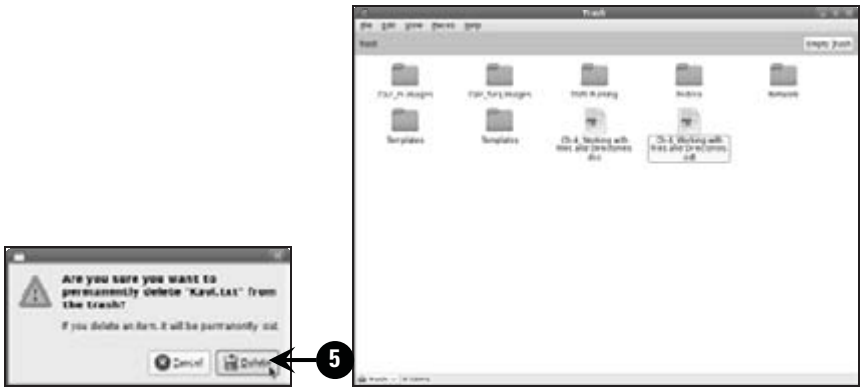


Fig.Linux-4.85 Fig.Linux-4.86

Let's now learn about emblems, which are used to mark their importance of files and folders.

Introducing Emblems

An emblem is a mark, which is assigned to a file or folder to signify its type and importance. For example, if a file is really important and should not be removed from the system, you can mark it as a special file by using the important emblem. You can select an emblem for a file from the Emblems tab of the Properties dialog box of the file.

Perform the following steps to mark a file with an emblem:

1. *Select* a file on which you want to mark an emblem. In our case, we have selected the **mini.txt** file (Fig.Linux-4.87).
2. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.88).
3. *Select* the **Properties** option from the drop-down menu (Fig.Linux-4.88).

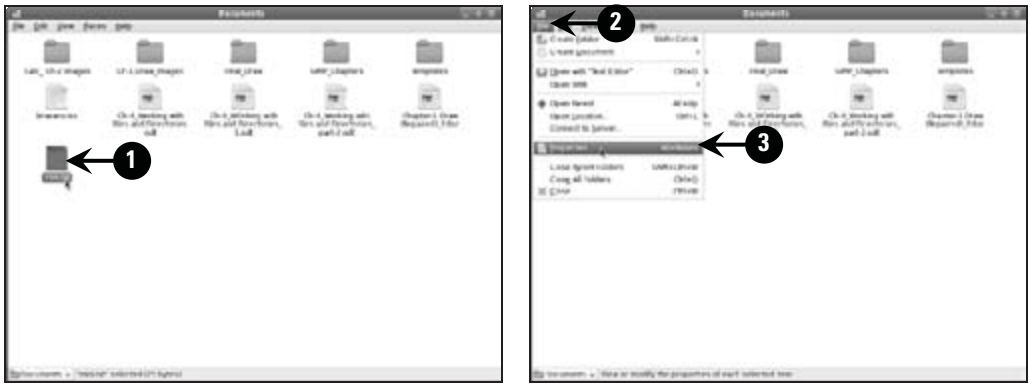


Fig.Linux-4.87 Fig.Linux-4.88

The **mini.txt Properties** dialog box appears (Fig.Linux-4.89).

4. *Select* the **Emblems** tab from the dialog box (Fig.Linux-4.89).
   The **Emblems** tab opens (Fig.Linux-4.90).
5. *Select* the check box beside the desired emblem that you want to apply for the file. In our case, we have selected the **important** emblem (Fig.Linux-4.90).

6. *Click* the **Close** button, to close the mini.txt Properties dialog box (Fig.Linux-4.90).

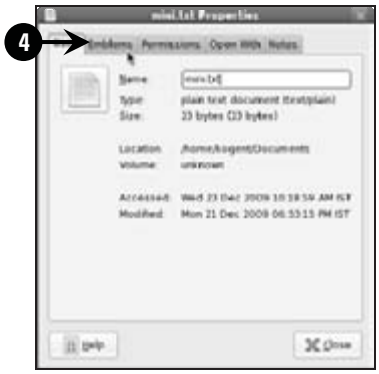


Fig.Linux-4.89

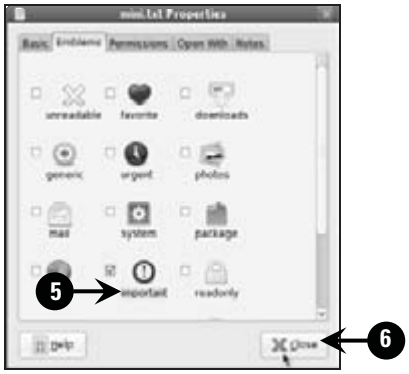


Fig.Linux-4.90

The desired emblem is applied to the selected file, as shown in Fig.Linux-4.91:



Fig.Linux-4.91

This emblem implies that the file is extremely important and should not be removed from the system.

Let's now learn to set permission for a file using the Nautilus window.

Setting the Permissions for a File by Using the Nautilus File Manager Window

When a new file is created, some permissions are assigned to it for each type of user by default. However, you can change the permissions for a file provided that you have access to the file.

Perform the following steps to change the permissions set to a file:

1. *Select* the file for whose permissions you want to change. In our case, we have selected the **mini.txt** file (Fig.Linux-4.87).
2. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.88).
3. *Select* the **Properties** option from the drop-down menu (Fig.Linux-4.88).
   The mini.txt Properties dialog box appears (Fig.Linux-4.92).
4. *Select* the **Permissions** tab in the **mini.txt** Properties dialog box (Fig.Linux-4.92).
   The **Permissions** tab opens (Fig.Linux-4.93).

5. *Click* the down arrow button beside the **Access** option under the **Group** section, to assign the read and write permissions to the users of the selected group. A drop-down list appears (Fig.Linux-4.93).
6. *Select* the **Read and write** option from the drop-down list (Fig.Linux-4.93).



Fig.Linux-4.92



Fig.Linux-4.93

7. *Click* the down arrow button beside the **Access** option under the **Others** section, to assign the read and write permission to other users. A drop-down list appears (Fig.Linux-4.94).
8. *Select* the **Read and write** option from the list (Fig.Linux-4.94).
9. *Click* the **Close** button to close the mini.txt Properties dialog box (Fig.Linux-4.95).



Fig.Linux-4.94



Fig.Linux-4.95

The Documents window appears (Fig.Linux-4.96).

10. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.96).
11. *Select* the **Close** option from the drop-down menu, as shown in Fig.Linux-4.96:

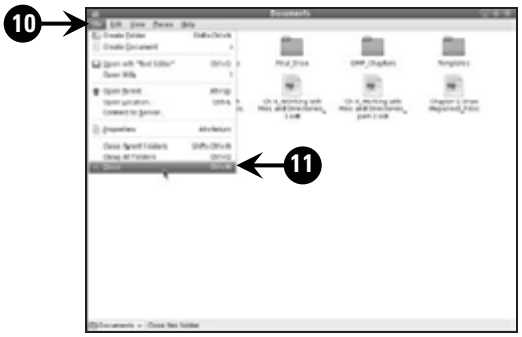


Fig.Linux-4.96

The Documents window closes.

Let's now learn to close the Nautilus File Manager window.

Closing the Nautilus File Manager Window

After completing your work with the files and folders in Linux, you can close the Nautilus File Manager window. You need to select the Close option in the File menu to close the window.

Perform the following steps to close the Nautilus File Manager window:

1. *Click* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.97).
2. *Select* the **Close** option from the menu, as shown in Fig.Linux-4.97:



Fig.Linux-4.97

The Nautilus File Manager window closes.

After learning to perform different tasks in the Nautilus File Manager window, let's now learn to work with storage media.

Working with Storage Media

In Linux, you can store data in the form of files on storage media other than the hard disk. You can use an external storage media, such as a floppy disk, a zip disk, or a CD to store files. Doing this helps you in recovering the data in case of a system crash. The most important difference between Linux and Windows in the use of external storage is that in Windows, you simply insert the disk to use it, whereas in Linux, you first have to mount the drive for the disk to use the disk. However, the procedure of mounting a disk drive is simple and easy. When you mount a disk in Linux, the filesystem of the disk is also mounted. When you mount a drive or device in Linux, a directory for that drive or device is created and that drive or device can be accessed through that particular directory. Such types of directories are created under a directory called /mnt. For example, if you mount a floppy drive, it will be accessible through a directory called /mnt/floppy.



When you mount a floppy disk or CD, an icon for the floppy/CD is automatically added to the desktop. You can use the icon of the floppy/CD to access its content.

In this section, you learn to check the hard disk space by using the df command; export data to a removable media; view the list of filesystems mounted in Linux; mount and burn a DVD-RW drive; and access a CD/DVD. Let's begin by learning to check the hard disk space.

Checking the Hard Disk Space by using the df Command

The df command is used to check the total and currently available space in a hard disk. You may sometimes need to install new packages in Linux. Before installing them, however, you need to check whether your system has sufficient space to store and manage the new software. In addition, it is important to check the available hard disk space before adding large amounts of data in the form of files.

Perform the following steps to check the available space in a hard disk by using the df command:

1. *Open* the **Terminal** window and switch to the root mode (Fig.Linux-4.98).
2. *Type* the **df** command in the Terminal window (Fig.Linux-4.99).
3. *Press* the **ENTER** key. The details of the hard disk space are displayed in the Terminal window (Fig.Linux-4.99).



Fig.Linux-4.98

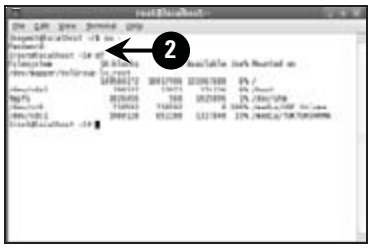


Fig.Linux-4.99

After checking the free space in your hard disk, let's move on and learn to export data to removable media.

Exporting Data to Removable Media

You can transfer or store important data in a removable storage device and access the data from the device according to you convenience. A pen drive is a removable storage device that can be used to easily transfer files between USB-compatible devices.

Perform the following steps to export data to removable media, such as a pen drive:

1. *Plug* the pen drive into the USB port of your computer. The computer automatically detects this new device (Fig.Linux-4.100).
2. *Right-click* the icon of the pen drive from the desktop and select the Open option from the context menu to open the drive (Fig.Linux-4.101).



Fig.Linux-4.100



Fig.Linux-4.101

The content of the pen drive open in the Nautilus File Manager window, as shown in Fig.Linux-4.102:



Fig.Linux-4.102

3. *Open* the home folder. In our case, we have opened the **kogent's Home** folder located on the GNOME desktop (Fig.Linux-4.103).

   The content of the **kogent** folder opens in the Nautilus File Manager window (Fig.Linux-4.104).

4. *Select* the folder that you want to export or transfer to the pen drive. You can press the **SHIFT** key to select two or more folders. In our case, we have selected the **New_Linux TOC, penOffice_Chapters** and **Pictures** folders (Fig.Linux-4.104).
5. *Right-click* any selected folder. A context menu appears (Fig.Linux-4.104).
6. *Select* the **Copy** option from the context menu (Fig.Linux-4.104).



Fig.Linux-4.103

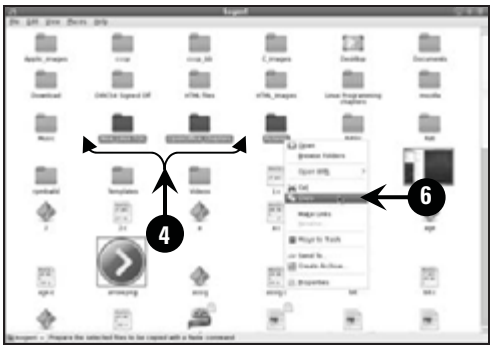


Fig.Linux-4.104

The selected folders are copied and stored into the clipboard.

7. *Click* the Minimize (-) button to minimize the kogent window, as shown in Fig.Linux-4.105:

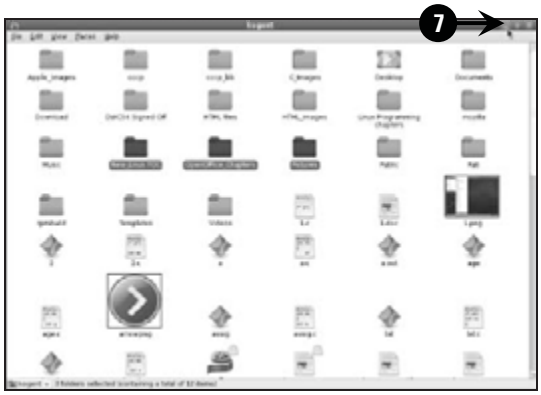


Fig.Linux-4.105

The window showing the content of the pen drive re-appears (Fig.Linux-4.106).

8. *Right-click* the empty space in the window. A context menu appears (Fig.Linux-4.106).
9. *Select* the **Paste** option from the context menu (Fig.Linux-4.106).

   The folders that you copied are pasted in the window (Fig.Linux-4.107).

10. *Click* the **Close** button in the window to close the window (Fig.Linux-4.107).

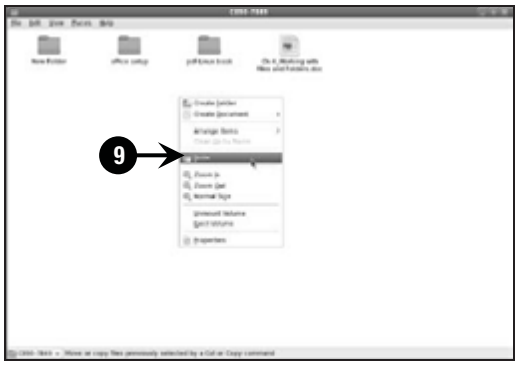


Fig.Linux-4.106



Fig.Linux-4.107

Let's now learn how to view a list of filesystems mounted on the Linux system.

Viewing the List of Filesystems Mounted On the Linux System

A filesystem refers to the entire hierarchy of directories (also known as directory tree) that is used to organize files on a computer. You need to mount a filesystem before you can view it. The filesystems that are automatically included may depend on the hardware peripherals of your system and the type of Linux system (workstation, server etc.) you have installed. You can view the list of mounted filesystems by using the Palimpsest Disk utility available in the Fedora Linux.

Perform the following steps to display a list of the available filesystems in the Fedora Linux system:

1. *Click* the **Applications** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.108).
2. *Select* the **System Tools** option from the drop-down menu. A submenu appears (Fig.Linux-4.108).
3. *Select* the **Palimpsest Disk Utility** option from the submenu (Fig.Linux-4.108).

The Palimpsest Disk Utility window appears on the screen. This window displays a list of the filesystems that are already mounted on your computer (Fig.Linux-4.109).

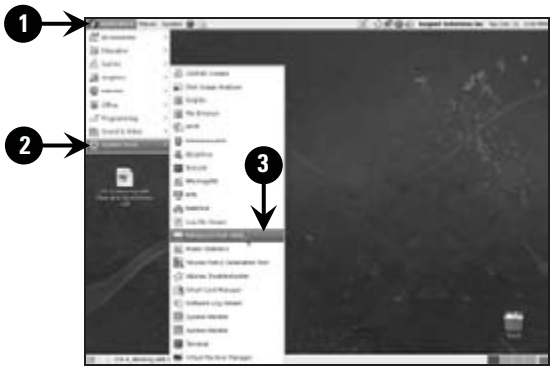


Fig.Linux-4.108



Fig.Linux-4.109

Let's now learn how to mount and burn a rewritable DVD (DVD-RW) drive.

Mounting and Burning a DVD-RW Drive

In Linux, the term mount refers to the process of attaching an additional filesystem to the currently accessible filesystem of a computer. When you mount a drive in a computer, the computer is able to read and write to the drive. You can mount a drive in the read only format also. You can also mount a CD/DVD in Linux as well as burn the CD/DCD. In this section, you learn to mount a DVD and then burn the DVD.

Perform the following steps to mount the DVD-RW drive:

1. *Click* the **Applications** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.110).
2. *Select* the **System Tools** option from the drop-down menu. A submenu appears (Fig.Linux-4.110).
3. *Select* the **Palimpsest Disk Utility** option from the submenu (Fig.Linux-4.110).

   The Palimpsest Disk Utility window appears, displaying a list of the filesystems that are already mounted on your computer (Fig.Linux-4.111)
4. *Select* the **Data disc (22 Dec 09)** DVD to mount the DVD, from the left pane of the Palimpsest Disk Utility window (Fig.Linux-4.111).
5. *Click* the **Mount** button from the Palimpsest Disk Utility toolbar (Fig.Linux-4.111).



Fig.Linux-4.110

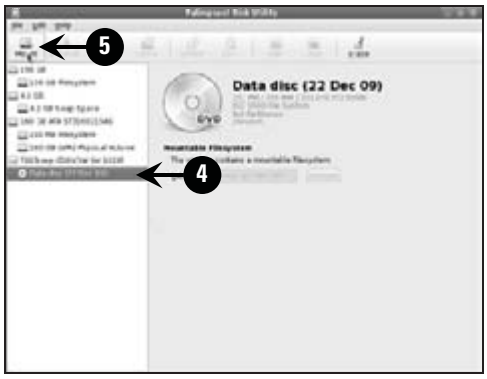


Fig.Linux-4.111

The DVD starts mounting and you can view the process at the right pane of the Palimpsest Disk Utility window (Fig.Linux-4.112).

When the mounting of the DVD is completed, a message appears on the Palimpsest Disk Utility window informing you that the DVD drive now contains a mountable filesystem.

6. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.113).
7. *Select* the **Quit** option (Fig.Linux-4.113).



Fig.Linux-4.112

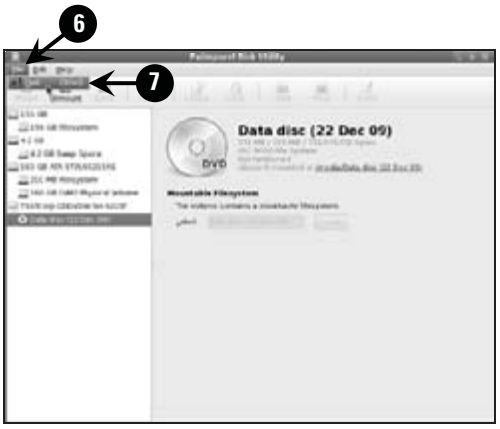


Fig.Linux-4.113

You quit from the Palimpsest Disk Utility window.

Let's now perform the following steps to burn a DVD:

1. *Insert* a blank DVD in the DVD drive and click the **Applications** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.114).
2. *Select* the **System Tools** option from the drop-down menu. A submenu appears (Fig.Linux-4.114).
3. *Select* the **CD/DVD Creator** option from the submenu, as shown in Fig.Linux-4.114:

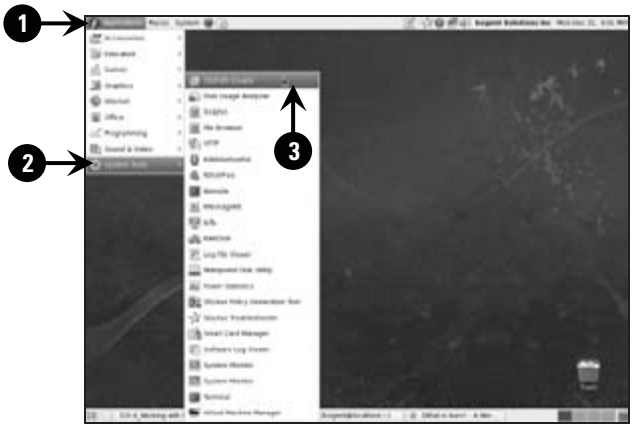


Fig.Linux-4.114

The CD/DVD Creator window appears (Fig.Linux-4.115).

4. *Open* the home folder on the GNOME desktop. In our case, we have opened the **kogent's Home** folder (Fig.Linux-4.116).
5. *P*ress the **SHIFT** key and *select* the folders that you want to burn or write on the DVD. In our case, we have selected the **GIMP, Impress_ch-2 images and Kavita** folders (Fig.Linux-4.116).



Fig.Linux-4.115

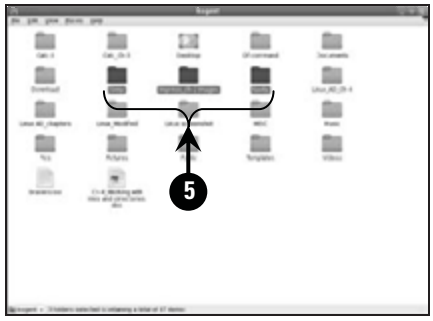


Fig.Linux-4.116

6. *Right-click* any selected folder. A context menu appears (Fig.Linux-4.117).
7. *Select* the **Copy** option from the context menu (Fig.Linux-4.117).
8. *Click* the **Close** button, in the titlebar to close the **kogent** window (Fig.Linux-4.117).
9. *Paste* all the selected folders in the CD/DVD Creator window (Fig.Linux-4.118).

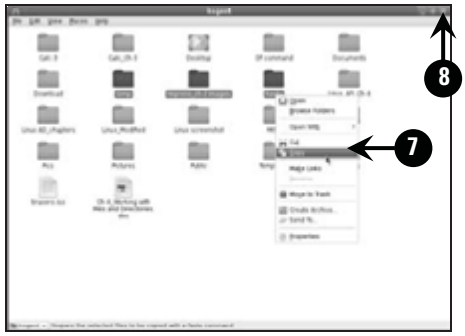


Fig.Linux-4.117



Fig.Linux-4.118

10. *Click* the **Write to Disc** button in the CD/DVD Creator window (Fig.Linux-4.119).

The **Disc Burning Setup** dialog box appears (Fig.Linux-4.119).

11. *Click* the **Burn** button (Fig.Linux-4.119).

    The **Brasero - Burning DVD** dialog box appears and displays the progress of the burning process of the DVD (Fig.Linux-4.120).



Fig.Linux-4.119



Fig.Linux-4.120

12. *Click* the **Close** button located on the titlebar of Brasero-Burning DVD dialog box when the burning process of the DVD is complete.



You can abort the burning process by clicking the Cancel button on Brasero – DVD Burning dialog box.

After the process of burning DVD is complete, the Data Disk icon appears on the desktop, as shown in Fig.Linux-4.121:



Fig.Linux-4.121

13. *Double-click* the **Data disc (22 Dec 09)** icon on the GNOME desktop (Fig.Linux-4.121).

    The Data disc (22 Dec 09) opens to display the data that you have burned in the DVD (Fig.Linux-4.122).



Fig.Linux-4.122

14. *Click* the **Close** button of the **Data disc (22 Dec 09)** window to close the window. Let's now learn to access a CD or DVD.

Accessing a CD/DVD

After mounting a CD drive in Linux, you can easily access any CD from the drive.

Perform the following steps to access a CD or DVD:

1. *Insert* the **CD/DVD** in the DVD-RW drive of your system. In our case, we have inserted a **CD**. The CD icon with the name **UDF Volume** appears on the desktop (Fig.Linux-4.123).
2. *Double-click* the CD icon, as shown in Fig.Linux-4.123:



Fig.Linux-4.123

The content of the CD appears in the Nautilus File Manager window (Fig.Linux-4.124).

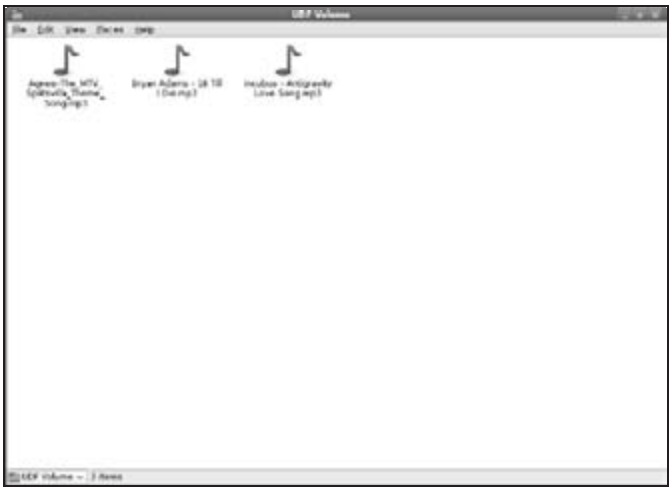


Fig.Linux-4.124

You can now easily select and access the content of the CD.

Next, let's learn how to burn a CD.

Burning a CD

Similar to a DVD, you can also burn CD in your system to store data. You computer must have a CD or DVD recorder to burn data on a CD.

Perform the following steps to burn data on a CD:

1. *Click* the **Applications** menu from the menu bar. A drop-down menu appears (Fig.Linux-4.125).
2. *Select* the **System Tools** option from the drop-down menu. A submenu appears (Fig.Linux-4.125).
3. *Select* the **CD/DVD Creator** option from the submenu, as shown in Fig.Linux-4.125:

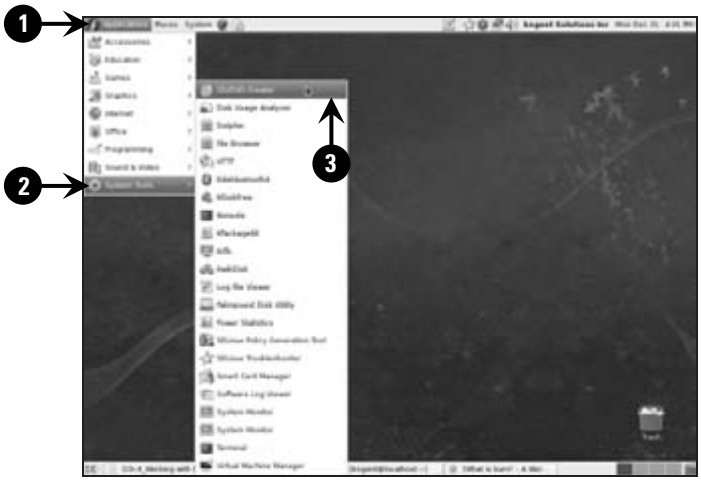


Fig.Linux-4.125

The CD/DVD Creator window appears (Fig.Linux-4.126).

4. *Open* the home folder on the desktop. In our case, we have opened the kogent's Home folder (Fig.Linux-4.127).
5. *Press* the **SHIFT** key and select the folders that you want to burn on the CD. In our case, we have selected the **GIMP, Impress_ch-2 images**, and **Kavita** folders (Fig.Linux-4.127).
6. *Right-click* any of the selected folders. A context menu appears (Fig.Linux-4.127).
7. *Select* the **Copy** option from the context menu (Fig.Linux-4.127).



Fig.Linux-4.126

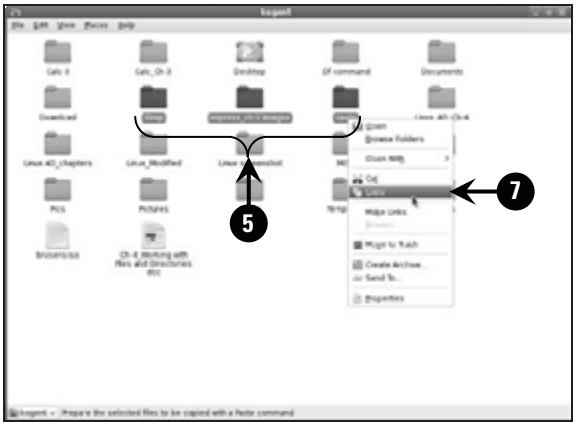


Fig.Linux-4.127

8. *Click* the **Close** button in the **title**bar of the kogent window to close the window, as shown in Fig.Linux-4.128:



Fig.Linux-4.128

9. *Insert* a blank CD in the CD/DVD-ROM drive on which you want to write the data. When you insert a blank CD, icon with the name Blank CD-R Disc appears on the GNOME desktop.
10. *Double-click* the CD icon to open the CD, as shown in Fig.Linux-4.129:



Fig.Linux-4.129

11. *Paste* the selected folders in the CD/DVD Creator window (Fig.Linux-4.130).
12. *Click* the **Write to Disc** button on the CD/DVD window (Fig.Linux-4.130).
    The **Disc Burning Setup** dialog box appears (Fig.Linux-4.131).
13. *Click* the **Burn** button (Fig.Linux-4.131).



Fig.Linux-4.130



Fig.Linux-4.131

Clicking the Burn button starts the CD burning process. The **Brasero - Burning CD** dialog box appears, showing the CD burning process, as shown in Fig.Linux-4.132:



Fig.Linux-4.132



You can abort the process of burning a CD by clicking the Cancel button in the Brasero – Burning CD dialog box.

14. *Click* the **Close** button after the burning process is complete, as shown in Fig.Linux-4.133:



Fig.Linux-4.133

15. *Double-click* the icon of the CD on the GNOME desktop to view the burned data, as shown in Fig.Linux-4.134:



Fig.Linux-4.134

With this, we come to the end of the chapter. Before move ahead to the next chapter, let's recap the main topics discussed in the chapter in a short summary.

Summary

The chapter has discussed the file and directory structure of Linux. It has explored the Terminal window as well as basic commands of Linux. You have learned to perform basics tasks such as creating, copying, and removing files and directories; using a wildcard with the ls command in Linux; applying permissions on files and directories; applying sticky bit on a directory; and moving files to a directory. Apart from this, have learned to work in Nautilus File Manager. In addition, the chapter has discussed the process of taking the backup of files and restoring the files. In the end of the chapter, you have learned to work with storage media, including checking hard disk space by using the df command, exporting data to a removable media, mounting a floppy drive, accessing a CD/DVD, and burn a CD.

CHAPTER

5

Compressing a File

In this Chapter:

- Introducing Compression Tools
- Working with Archive Manager
- Working with the Recompression Utility

Compression is the process of reducing the size of a file by encoding its data. It is a technique to make a data stream smaller for faster transmission. There are a number of applications (such as Archive Manager, WinZip, and recompression utility) that compresses files. The compression utility reduces the size of data by reducing the number of bits and bytes used to store the data. This saves the space and transmission time while transmitting files from one location to another. Compression is of two types: lossless and lossy. The lossless compression reduces the file size without loosing the information of the file. However, the lossy compression may lose some information. The compressed files have the following extensions of .ar, .zip, and tar.

In this chapter, you learn the two compression tools named as Archive Manger and recompression utility. Further, you learn to work with Archive Manager to backup files in a compressed form, adding files to an archive, and extracting files from an archive. You also learn to work with recompression utility.

Let's begin with the compression tools.

Introducing Compression Tools

The compression tools are used to compress the text files, graphics, and videos. Linux provides various compression tools; some of them are Graphics User Interface (GUI) based and some are command-line based. The GUI based compression tools provide the graphical interface, which helps you in creating archive and compressed files. On the other hand, the command line based compression tools provide text-based interface where you can execute various commands to compress and extract files. In this chapter, you learn the following two compression tools:

- Archive Manager (File Roller)
- Recompression Utility

Let's begin with Archive Manager first.

Archive Manager (File Roller)

Archive Manager is a Graphical User Interface (GUI) utility that performs file compression and archiving functions. It is also known as File Roller. It supports common UNIX and Linux file compression and archiving formats, such as tar and zip.

Recompression Utility

Recompression utility is an advance compression technique to re-compress the files. You can perform recompression on the command line mode in Fedora Linux. The advance compression is used to reduce the storage space as much as possible. The reduction in storage space makes the transfer of file from one location to another easier.

Working with Archive Manager

In Fedora 11, the Archive Manager (File Roller) utility is used to take backup of the files in either normal or compressed form. Backing up important files is necessary because files could be lost in case of system crash or virus attack. If the number and size of files are large and the hard disk space is limited, we can take backup of such files in a compressed form. The basic function of Archive Manager is to create archives, add files to archives, and unpack archive files. An archive file can contain a number of other files, which are usually in a compressed form. This reduces the file size in comparison to the original file size to make the original file easy to move from one location to other.

We can use Archive Manager for compressing and backing up files, which can be stored in some external storage media and used in case of a system crash or for any retrospective purpose.

Let's perform the following steps to open Archive Manager:

1. *Click* the **Applications** menu from the panel menu bar. A drop-down list appears (Fig.Linux-5.1).
2. *Select* the **Accessories** option from the drop-down list. A submenu appears (Fig.Linux-5.1).
3. *Select* the **Archive Manager** option from the submenu (Fig.Linux-5.1).

The **Archive Manager** window appears (Fig.Linux-5.2).



Fig.Linux-5.1



Fig.Linux-5.2

Let's now learn how to backup a file in a compressed form.

Backing up a File in a Compressed Form

You can take backup of a file in a compressed form by using Archive Manager. It saves time and reduces the storage space when you send a large file via electronic media.

Perform the following steps to take the backup of a file in a compressed form:

1. *Click* the **New** button on the Toolbar of the **Archive Manager** window (Fig.Linux-5.3).
   The **New** dialog box appears (Fig.Linux-5.4)
2. *Drag* the vertical scroll bar to select the desired folder under which you wish to create a new archive file. In our case, we have selected the **Gimp** folder (Fig.Linux-5.4).
3. *Click* the down-arrow beside the **Archive type** option. A drop-down list of archive types appears (Fig.Linux-5.4).

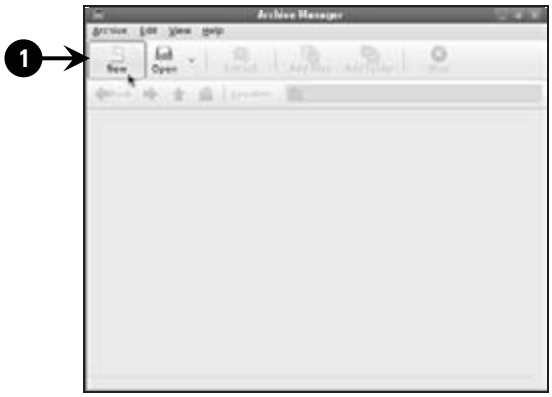


Fig.Linux-5.3

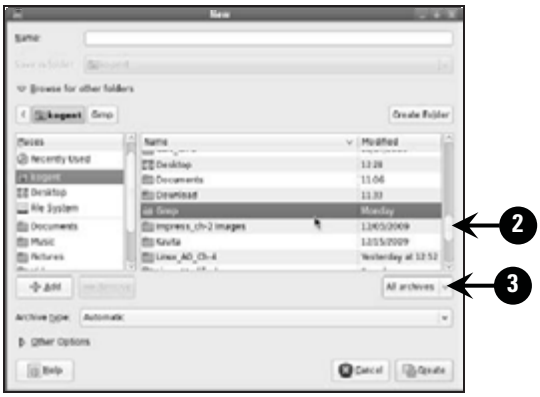


Fig.Linux-5.4

4. *Select* the desired archive type. In our case, we have selected the **Zip (.zip)** type (Fig.Linux-5.5).
5. *Click* the **Create** button from the **New** dialog box (Fig.Linux-5.6).

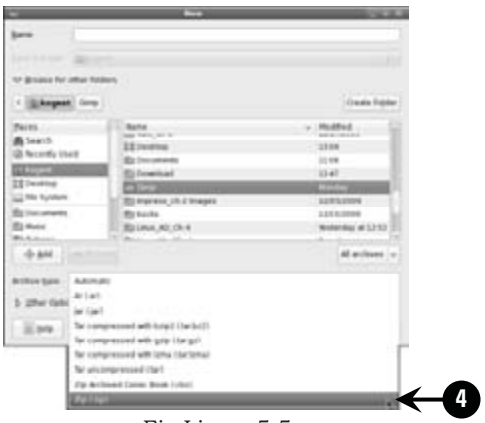


Fig.Linux-5.5

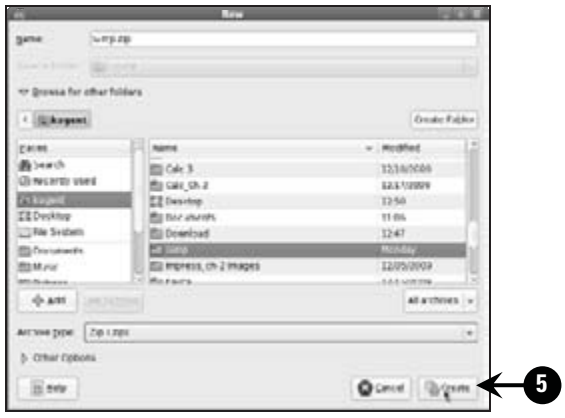


Fig.Linux-5.6

A new empty archive file with the name **Gimp.zip** is created and opened on the screen, as shown in Fig.Linux-5.7:



Fig.Linux-5.7

You have created the empty archive file of Gimp folder by creating its zip file.

Let's now learn to add files to an archive file.

Adding Files and Folders to an Archive File

The archive file named as Gimp.zip file, which you have just created, is empty. You can store and compress files and folders by adding them in the Gimp.zip file.

Let's perform the following steps to add files to an archive file:

1. *Click* the **Add Files** button on the Toolbar of the **Gimp.zip** window (Fig.Linux-5.8).

   The **Add Files** dialog box appears (Fig.Linux-5.9).
2. *Select* the file that you want to compress. In our case, we have selected the **Essential** file (Fig.Linux-5.9).
3. *Click* the **Add** button (Fig.Linux-5.9).



Fig.Linux-5.8

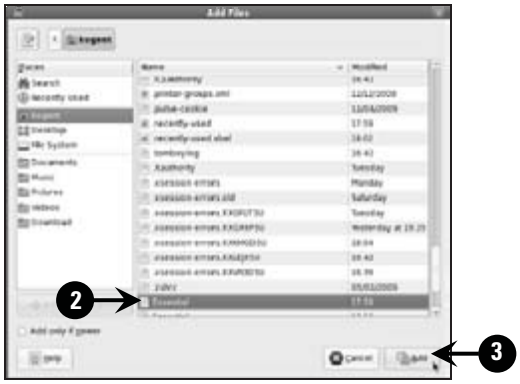


Fig.Linux-5.9

As you click the **Add** button, Archive Manager starts loading the file (Fig.Linux-5.10).

The selected file is added to the archive file **Gimp.zip** (Fig.Linux-5.11).



Fig.Linux-5.10



Fig.Linux-5.11

4. *Click* the **Add Folder** button in the Toolbar of the Gimp.zip window (Fig.Linux-5.12).
   The **Add a Folder** dialog box appears (Fig.Linux-5.13).
5. *Select* the folder, which you want to add to the archive file. In our case, we have selected the **Kavita** folder (Fig.Linux-5.13).
6. *Click* the **Add** button (Fig.Linux-5.13).



Fig.Linux-5.12

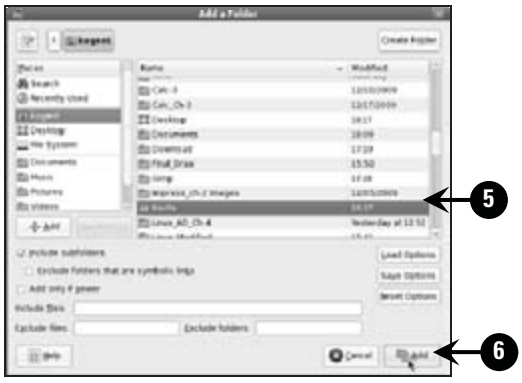


Fig.Linux-5.13

As you click the **Add** button, Archive Manager starts adding folders to the archive file. This process can take few seconds to complete (Fig.Linux-5.14).

After sometime, the **Kavita** folder is added to the **Gimp.zip** archive file (Fig.Linux-5.15).



Fig.Linux-5.14



Fig.Linux-5.15

Let's now learn to extract files from an archive.

Extracting Files from an Archive

If you have stored some files in an archive file in a compressed form and want them back, you can do so by extracting the files from the archive. Archive Manager also lets us extract files back from an archive **Gimp.zip**.

Let's perform the following steps to extract all files from the archive file you have created:

1. *Select* the file that you wish to extract. In our case, we have selected the **Essential** file (Fig.Linux-5.16).
2. *Click* the **Extract** button from the Toolbar of the Gimp.zip window (Fig.Linux-5.16).

   The **Extract** dialog box appears (Fig.Linux-5.17).
3. *Select* the location where you want to save the extracted files. In our case, we have selected **Download** (Fig.Linux-5.17).
4. *Click* the **Extract** button in the Extract dialog box (Fig.Linux-5.17).

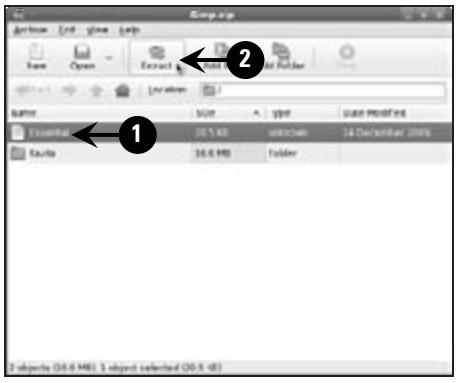


Fig.Linux-5.16



Fig.Linux-5.17

As you click the **Extract** button, the **Extracting files from archive** message box appears, which shows the message that extraction process is completed successfully (Fig.Linux-5.18).

5. *Click* the **Open the Destination** button to view the location of the file you have extracted (Fig.Linux-5.18).

As you click the **Open the Destination** button, the destination that you select to save extracted files is opened (Fig. Linux-5.19). In our case, we have saved the extracted files in the Download folder.

6. *Click* the **Close** button from the title bar of the **Download** window to close the window (Fig.Linux-5.19).



Fig.Linux-5.18



Fig.Linux-5.19

The Download window is closed.

Let's perform the following steps to extract a folder:

1. *Select* the desired folder that you wish to extract. In our case, we have selected the **Kavita** folder (Fig.Linux-5.20).
2. *Click* the **Extract** button from the **Gimp.zip** Toolbar (Fig.Linux-5.20).

   The **Extract** dialog box appears (Fig.Linux-5.21).
3. *Select* the location where you want to save the extracted folder. In our case, we have selected **Desktop** (Fig.Linux-5.21).
4. *Click* the **Extract** button in the Extract dialog box (Fig.Linux-5.21).



Fig.Linux-5.20

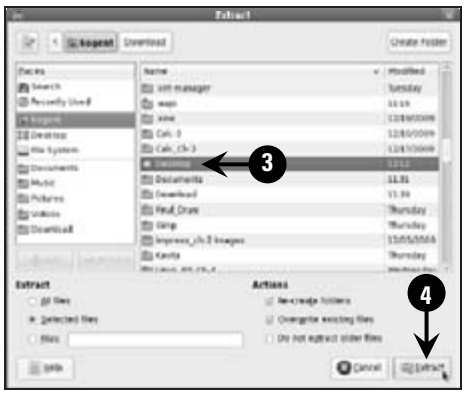


Fig.Linux-5.21

As you click the **Extract** button, the **Extracting files from archive** message box appears, which shows the message that extraction is completed successfully (Fig.Linux-5.22).

5. *Click* the **Open the Destination** button, to view the file that you have extracted (Fig.Linux-5.22).

   As you click the **Open the Destination** button, the destination from where you have extracted the file is opened. In our case, it is Desktop (Fig.Linux-5.23).
6. *Click* the **Close** button, from the **Desktop** title bar to close the **Desktop** window, as shown in Fig. Linux-5.23:



Fig.Linux-5.22



Fig.Linux-5.23



The directory to which you are extracting the files of an archive should not contain any file names, because that would lead to the overwriting of the original files of the directory with the files of the archive.

After learning the process of extracting files and folders, let's now learn to close Archive Manager.

Closing Archive Manager

After working with Archive Manager, you can close it.

Perform the following steps to close Archive Manager:

1. *Select* the **Archive** menu in the Menu bar. A drop-down list appears (Fig.Linux-5.24).
2. *Select* the **Close** option from the drop-down list, as shown in Fig.Linux-5.24:



Fig.Linux-5.24

The Archive Manager window is closed.

After closing the Archive Manager utility, let's now learn to work with recompression utility.

Working with the Recompression Utility

The recompression utility is used to re-compress the .ZIP, .PNG (Portable Network Graphics), and .MNG (Multiple-image Network Graphics) files. The purpose of recompression is to reduce the file size as much as possible without loosing information. AdvanceCOMP tool is used to re-compress the .ZIP, .PNG, and .MNG files. AdvanceCOMP re-compresses the .ZIP, .MNG, and .PNG files by using another command line utility, Deflate 7-Zip, for compressing files. AdvanceCOMP uses the advzip, advpng, and advmng utilities to re-compress files. You can re-compress the files only when the recompression utilities are installed in your system.

Perform the following steps to check whether the recompression utilities are installed in your system or not:

1. *Select* **System→Administration→Add/Remove Software** (Fig.Linux-5.25).
   The **Add/Remove Software** window appears (Fig.Linux-5.26).
2. *Enter* recompression utilities in the text box beside the **Find** button (Fig.Linux-5.26).
3. *Click* the **Find** button (Fig.Linux-5.26).
   The searched result appears in the display pane (Fig.Linux-5.26). The Re-compression utilities for .PNG, .MNG and .ZIP files check box is selected that means utilities is installed in your system.



Fig.Linux-5.25



Fig.Linux-5.26

In case, the recompression utilities are not installed in your system, you can install it by first selecting the check box from the right paneand then clicking the Apply button.

Let's now learn about the advzip utility.

Using the advzip Utility

The advzip utility is used to re-compress the ZIP archive files to attain the smallest possible size. You can create a new archive and extract the content of an archive using this utility. You can also list the content of an archive and test an archive. While re-compressing the .zip files, you can set the compression levels, such as normal, fast, extra, and inance. The following is the command for re-compressing the zip files:

```
advzip [Modes] [options] [Files]
```

Table 5.1 shows various modes of the advzip utility:

Table 5.1: Description of Modes used in the advzip Utility

Modes	Purpose
-a	Refers to the mode that helps to create a new archive with the specified files
-x	Refers to the mode that helps to extract the content of an archive
-l	Refers to the mode used to list down the content of archives
-t	Refers to the mode used to test the specified archives
-z	Refers to the mode used to re-compress the specified archives

Table 5.2 shows the details of commonly used options:

Table 5.2: Description of commonly used Options used in the advzip Utility

Options	Purpose
-0	Refers to the option used to disable the compression
-1	Sets the level of compression to fast
-2	Sets the level of compression to normal

Table 5.2: Description of commonly used Options used in the advzip Utility	
Options	**Purpose**
-3	Sets the level of compression to extra
-4	Sets the level of compression to insane

Let's now learn to re-compress the .ZIP files by performing the following steps:

1. *Select* the **Applications→System Tools→Terminal** (Fig.Linux-5.27).
   The Terminal window appears (Fig.Linux-5.28).
2. *Type* the **advzip -z -2 cccp_bb.zip** command to re-compress the cccp_bb.zip file (Fig.Linux-5.28).
3. *Press* the **ENTER** key. The file gets re-compressed to the normal compression level (Fig.Linux-5.28).

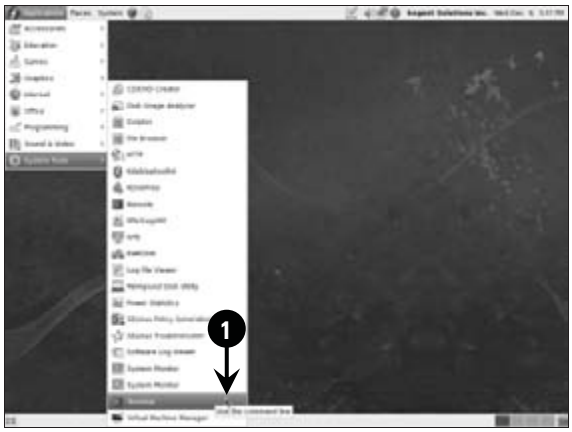


Fig.Linux-5.27

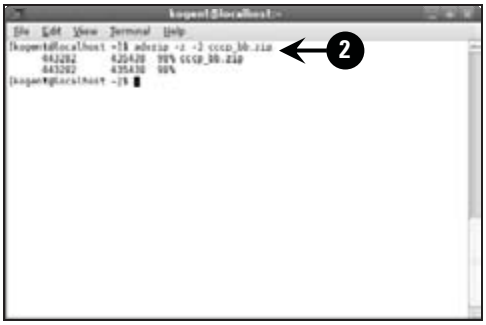


Fig.Linux-5.28



cccp_bb.zip is a ZIP file. You can create a zip file by using Archive Manager that we have discussed earlier in this chapter.

Let's now learn to use the advpng utility.

Using the advpng Utility

The advpng utility is used to re-compress the .PNG files. This utility is also used to list the file content. The following is the command for re-compressing the .PNG files:

```
advpng [Modes] [Options] [Files]
```

The description about the Modes and Options fields are discussed in the following tables. Table 5.3 shows the use of various Modes:

Table 5.3: Description of using Modes	
Modes	**Purpose**
-l	Refers to the mode that lists the content of files
-z	Refers to the mode that is used to re-compress the specified files

Table 5.4 shows the commonly used Options in the advpng utility:

Table 5.4: Description of commonly used Options	
Options	**Purpose**
-0	Refers to the option that is used to disable the compression
-1	Sets the level of compression to fast
-2	Sets the level of compression to normal

Table 5.4: Description of commonly used Options	
Options	**Purpose**
-3	Sets the level of compression to extra
-4	Sets the level of compression to insane
-h	Refers to the help feature of advpng utility

Perform the following steps to re-compress the .PNG files:

1. *Type* **cd /home/kogent/Totem1** to make the **Totem1** directory as current directory (Fig.Linux-5.29).
2. *Press* the **ENTER** key. The cursor moves to the **Totem1** current directory (Fig.Linux-5.29).
3. *Type* the **advpng -z -2 5.png** command to re-compress the 5.png file (Fig.Linux-5.30).
4. *Press* the **ENTER** key. The file is re-compressed to the normal compression level (Fig.Linux-5.30).

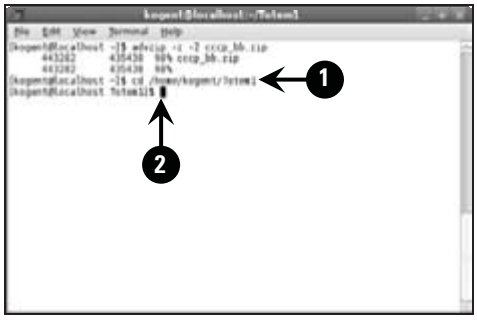


Fig.Linux-5.29

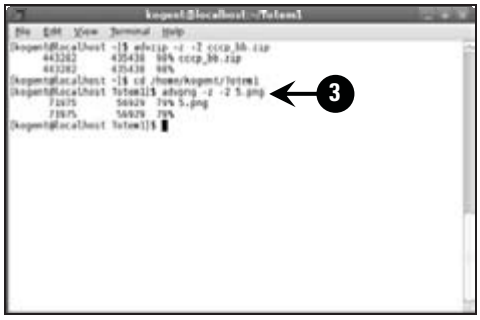


Fig.Linux-5.30

Let's now learn about the advmng utility.

Using the advmng Utility

The advmng utility is used to re-compress the .MNG video clips. This utility is also used to list the file content and extract the .PNG frames. While using the advmng utility, you can set the compression levels to fast, normal, extra, insane, and scroll optimization. The following is the command for re-compressing the .MNG video clips:

```
advmng [Modes] [options] [FILES...]
```

The description about the Modes and Options fields used in the preceding command of the advmng utility is provided in Table 5.5:

Table 5.5: Description of using Modes	
Modes	**Purpose**
-l	Refers to the mode that lists the content of files
-z	Refers to the mode that is used to re-compress the specified files
-x	Refers to the mode that helps to extract the .PNG frames
-a	Refers to the mode that is used to create a .MNG file at F frame/s from .PNG files

Table 5.6 shows the commonly used Options in the advmng utility:

Table 5.6: Description of the commonly used Options	
Options	**Purpose**
-0	Refers to the option that is used to disable the compression
-1	Sets the level of compression to fast
-2	Sets the level of compression to normal
-3	Sets the level of compression to extra

Table 5.6: Description of the commonly used Options	
Options	**Purpose**
-4	Sets the level of compression to insane
-s	Refers to the option that enables the scroll optimization with an N×M pattern
-S	Refers to the option that enables the scroll optimization with an N×N pattern

Perform the following steps to re-compress the .MNG video clip:

1. *Move* to the directory where you have stored a .MNG video clip by typing the cd command in the Terminal window. We enter the **cd** command to move to default directory and then type **cd /home/kogent/Videos** to move to the **Videos** directory (Fig.Linux-5.31).
2. *Press* the **ENTER** key. The **Videos** directory is the current directory now (Fig.Linux-5.32).
3. *Type* the **advmng -z -4 butterfly.mng** command to re-compress the butterfly.mng video clip (Fig.Linux-5.33).

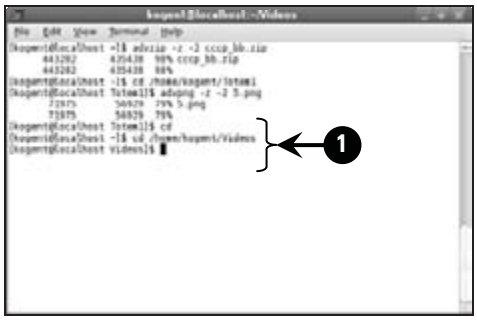


Fig.Linux-5.31

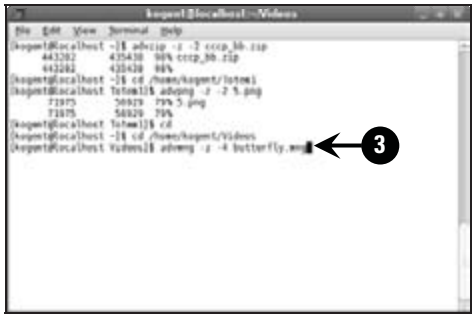


Fig.Linux-5.32

4. *Press* the **ENTER** key. The butterfly.mng video clip is re-compressed to the extreme compression level (Fig.Linux-5.33).



Fig.Linux-5.33

With this, we come to end of this chapter. Before proceeding towards the next chapter, let's now summarize the main points of this chapter.

Summary

In this chapter, you have learned about the compression tools, such as Archive Manager and recompression utility. You also learned to create the backup of files in a compressed form. In addition, you learned to add and extract files from an archive. You have learned to re-compress .ZIP archive, .PNG snapshots, and .MNG video clips by using re-compressing utilities.

CHAPTER

6

Working with Applications

In this Chapter:

- Opening a Text Editor
- Quitting the Text Editor
- Opening and Modifying an Existing Document
- Working with Packages
- Opening a PDF File using Adobe Acrobat
- Working with Music and Video

An application is a software program that helps you to perform a particular task or a set of tasks. For example, there are applications that allow us to make useful text documents, such as letters and reports. In addition, there are applications that help us to play music and movies. These applications are very useful to perform day-to-day tasks. You must have worked with several applications using the Windows platform. Linux too allows us to work with a number of applications using an easy-to-use Graphical User Interface (GUI).

In this chapter, you learn to work with a text editor, in which you learn how to create and save a document. Finally, you learn to close the text editor. You also learn to open and modify an existing document in a text editor. Further, you learn to install and uninstall a package. In addition, you explore how to work with music and video applications, such as an audio CD extractor known as Sound Juicer, Totem Movie Player, and Rhythmbox Music Player, in Fedora 11.

Opening a Text Editor

A text editor is an application used to create and edit text documents. In Fedora 11, gedit is the default text editor for the GNOME desktop. When you install Linux in your system, this editor is installed by default.

Perform the following steps to open the gedit text editor:

1. *Click* the **Applications** menu on panel menu bar of the desktop (Fig.Linux-6.1). A drop-down menu appears (Fig.Linux-6.1).
2. *Place* the mouse-pointer over the **Accessories** option on the drop-down menu (Fig.Linux-6.1). A sub-menu appears (Fig.Linux-6.1).
3. *Select* the **Text Editor** option from the sub-menu (Fig.Linux-6.1).

   The gedit window appears (Fig.Linux-6.2).



Fig.Linux-6.1

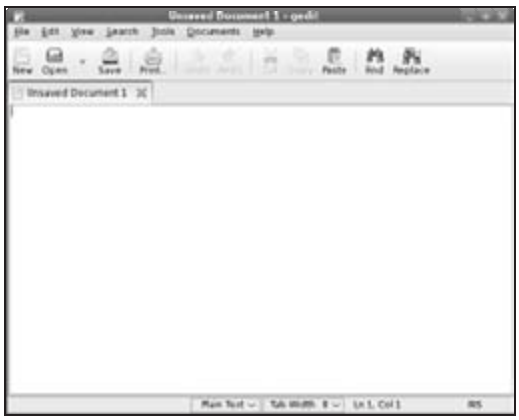


Fig.Linux-6.2

Let's now learn to create a document in the gedit text editor.

Creating a Document

As we have already mentioned, we use a text editor to create and modify a text document quickly and easily. When you open a text editor, it contains a blank, unsaved file, named Unsaved Document 1 by default. If we enter information in this file and save it with some name, under one of the directories in our system, this would become a text document. There is a blinking cursor placed at the beginning of the blank file indicating that we can start entering text at the location where it is blinking. You may use the following tips while typing the text:

- Press the CAPS LOCK key once to type the text in capital letters.
- Press the SPACEBAR key to make a space of single character.
- Press the BACKSPACE key to remove the character to the left of the current cursor position.

- Press the DELETE key to remove the character to the right of the current cursor position.
- Press the ENTER key to make a space of a blank line.

Let's now enter some data in this blank file.

Perform the following steps to create a text document:

1. *Type* the following text in the display area of text editor (Fig.Linux-6.3).
   Fedora 11 is a powerful operating system that is gaining popularity with a pace.
   The gedit window with the preceding text (Fig.Linux-6.3).
2. *Move* the mouse-pointer before the word where you want to insert a new word. A blinking cursor appears immediately before that word. For example, we want to insert a word before the pace text (Fig.Linux-6.4).

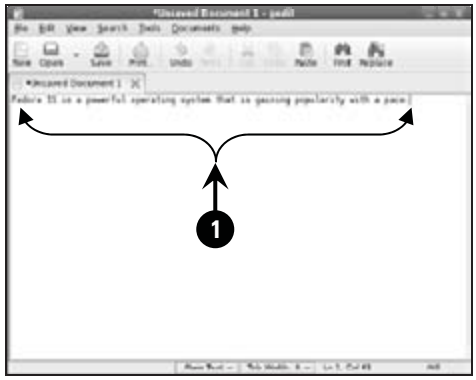


Fig.Linux-6.3

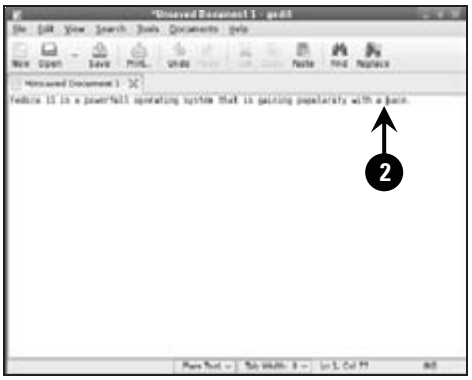


Fig.Linux-6.4

3. *Type* the word that you want to insert. In our case, we have typed **fast** (Fig.Linux-6.5).
4. *Press* the **SPACEBAR** key to make a space of a character if required. The space is inserted between the text **fast** and **pace (**Fig.Linux-6.6).

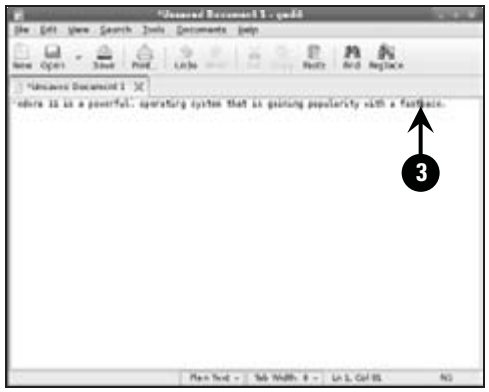


Fig.Linux-6.5

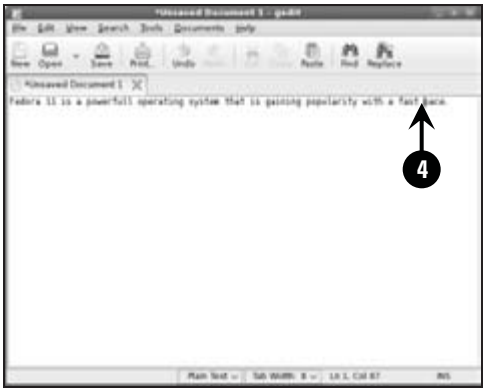


Fig.Linux-6.6

Let's now add some more text in the form of a heading to our text document.

5. *Place* the mouse-pointer at the beginning of the text. In our case, it is before term Fedora and *click* at that position (Fig.Linux-6.7).
6. *Press* the **ENTER** key to insert a blank line (Fig.Linux-6.8).
7. *Press* the up arrow key to move the cursor up. Now, the cursor is at the beginning of the document (Fig.Linux-6.8).



Fig.Linux-6.7



Fig.Linux-6.8

8. *Type* **Fedora 11** to add a heading in our document, as shown in Fig.Linux-6.9:

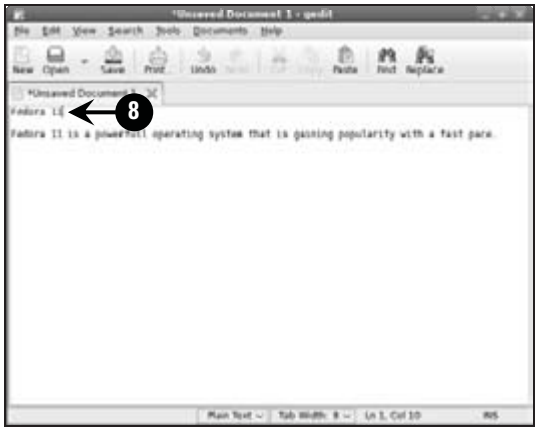


Fig.Linux-6.9

After creating the text document, let's now learn how to save it.

Saving the Document

Saving is the process of storing the information that you have typed in your document on your hard disk or some other external storage disk, such as a pen drive and CD/DVD (Compact Disc/Digital Versatile Disc) drive. After creating a document, you need to save it under a directory with a name so that you can use it in future. If you try to close a document without saving it, Linux displays a message asking you whether you want to save it or not. If you click Yes, a Save AS dialog box appears where you can type a name for the new document and specify the directory where you want to save it. If you click No in the message box, the information you typed in the document is lost forever.

Perform the following steps to save your document:

1. *Select* the **File** menu on the Menu bar (Fig.Linux-6.10). A drop-down menu appears (Fig.Linux-6.10).
2. *Select* the **Save As** option from the drop-down menu (Fig.Linux-6.10).
   The **Save As** dialog box appears (Fig.Linux-6.11).



Fig.Linux-6.10

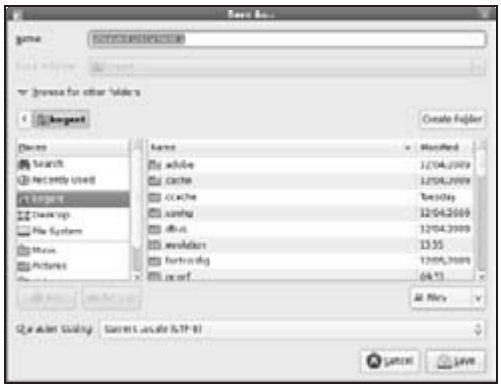


Fig.Linux-6.11

Unsaved Document 1 is the default name of the file that appears in the **Name** text box and by default the user's home directory is the current directory in the Save As dialog box. However, you can change the file name as well as the location where you want to save your document.

3. *Press* the **DELETE** key to remove the default name from the **Name** text box and *type* the document name in it. In our case, it is **textdoc** (Fig.Linux-6.12).
4. *Select* a directory where you want to save your document. In our case, it is **kogent** (Fig.Linux-6.12).
5. *Click* the **Save** button in the dialog box (Fig.Linux-6.12).

   As soon as you click the **Save** button in the dialog box, the document is saved in the selected location. The new document name appears on the title of the gedit window (Fig.Linux-6.13).

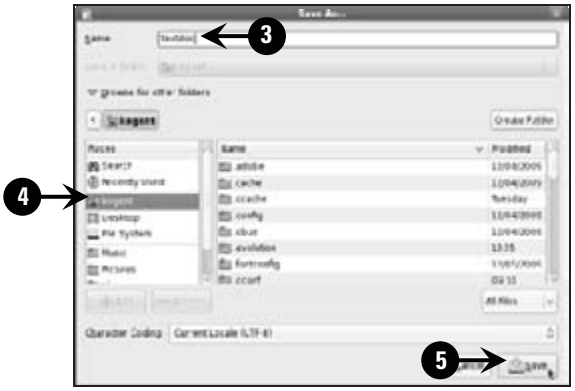


Fig.Linux-6.12



Fig.Linux-6.13

Let's now learn to close the text document.

Closing the Document

Now that you have created and saved your text document, you can safely close it. You can open this document again and modify it whenever you want to because it is saved on the hard disk of your computer. Closing this document does not mean that the gedit window will close. The blank gedit window remains on the screen.

Perform the following steps to close the document:

1. *Click* the **File** menu in the Menu bar of the gedit window (Fig.Linux-6.14). A drop-down menu appears (Fig.Linux-6.14).
2. *Select* the **Close** option from the drop-down menu (Fig.Linux-6.14).

   The document is immediately closed and you return on the empty gedit window (Fig.Linux-6.15).

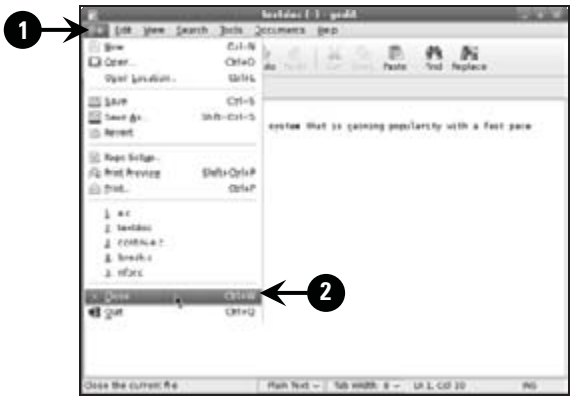


Fig.Linux-6.14



Fig.Linux-6.15

After closing the document, let's now learn to quit the text editor.

Quitting the Text Editor

Closing a document in the text editor does not mean that text editor (the gedit window) would be closed. You need to quit the text editor after finishing your work to close it.

Perform the following steps to quit the text editor:

1. *Click* the **File** menu on the Menu bar of the gedit window. A drop-down menu appears (Fig.Linux-6.16).
2. *Select* the **Quit** option from the drop-down menu (Fig.Linux-6.16).
   The gedit window is closed immediately and you return to desktop (Fig.Linux-6.17).



Fig.Linux-6.16

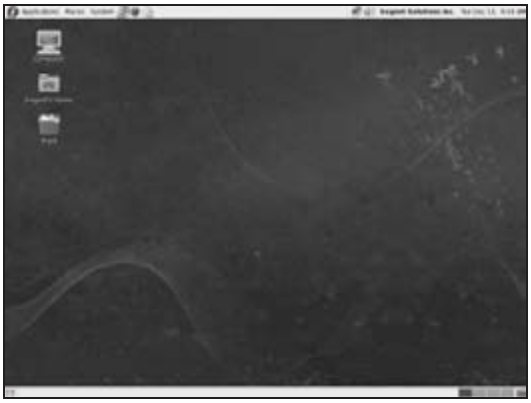


Fig.Linux-6.17

In the preceding section, you learned to quit the gedit text editor. Let's now learn to open and modify the document that we have recently saved.

Opening and Modifying an Existing Document

As we have already mentioned, you can open a document again after saving it and carry out any necessary modifications. You can either save these changes or quit without saving.

Perform the following steps to open and modifying an existing document:

1. *Select* **Applications→Accessories→Text Editor** (Fig.Linux-6.18).
   The gedit window appears (Fig.Linux-6.19).
2. *Click* the **Open** button in Toolbar (Fig.Linux-6.19).

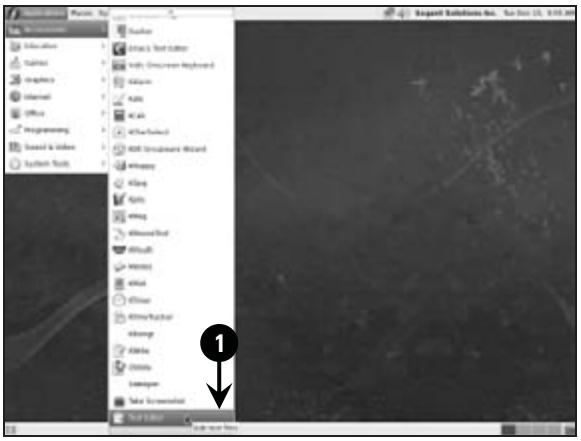


Fig.Linux-6.18

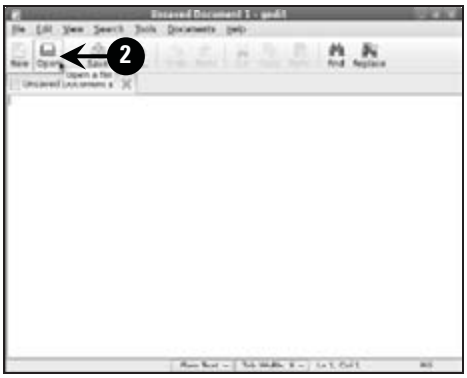


Fig.Linux-6.19

The **Open Files** dialog box appears (Fig.Linux-6.20).

3. *Select* the location, where you have saved your document. In our case, we have selected the **kogent** directory (Fig.Linux-6.20).
4. *Select* the file from the right pane. In our case, we have selected the **textdoc** file (Fig.Linux-6.20).
5. *Click* the **Open** button (Fig.Linux-6.20).

   The selected file, **textdoc** opens in the gedit window (Fig.Linux-6.21).



Fig.Linux-6.20



Fig.Linux-6.21

6. *Click* at the end of the last line of the text. A blinking cursor appears at the location where you click (Fig.Linux-6.22).
7. *Press* the **ENTER** key to move the cursor to the next line.
8. *Type* the following text in the display area of the gedit window (Fig.Linux-6.23).

   The more admirable features of Linux, because of which it appears to more and more users everyday, is that it is an open source, that it is available as a free software.

   The gedit window with the preceding text (Fig.Linux-6.23).



Fig.Linux-6.22

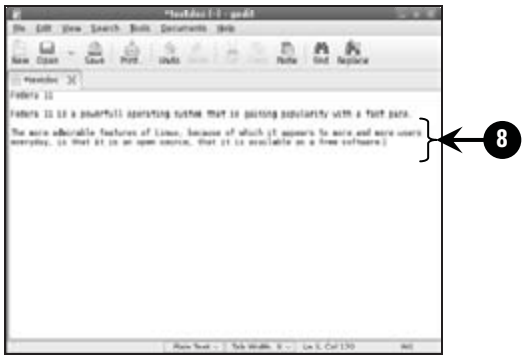


Fig.Linux-6.23

9. *Click* the **Close** button on the title bar of the gedit window (Fig.Linux-6.24).

   A message box appears asking you whether you want to save your document or not (Fig.Linux-6.25).

10. *Click* the **Save** button to save your document (Fig.Linux-6.25).



Fig.Linux-6.24



Fig.Linux-6.25

As soon as you click the **Save** button in the message box, it is saved in the location where you have saved it last time. The message box disappears and gedit window also closes. You return to desktop again, as shown in Fig.Linux-6.26:

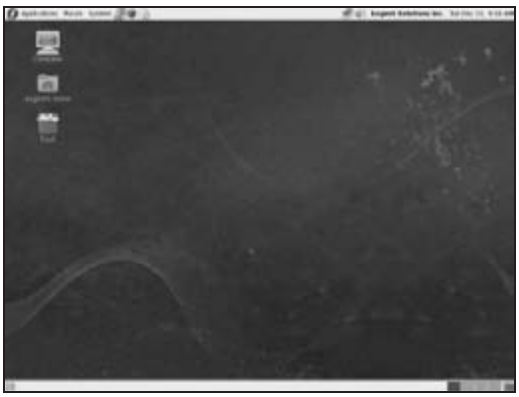


Fig.Linux-6.26

In the preceding section, you have learned to open and modify an existing document. In the following section, you learn about the package.

Working with Packages

A package is a set of files required to install, configure, and execute an application on your system. When you install a package on a system, a number of related files are copied to hard disk and saved in the appropriate directories in your system.

When we install Fedora 11 on our system, some packages are automatically installed. We can view a list of packages installed in the Linux system. If we require any other package, we can install it later.

In this section, you learn to install a package.

Installing and Uninstalling a Package Using the Add/Remove Software Application

When you install Fedora 11 in your system, a number of packages installed automatically. However, you can install other packages if required later. You can also uninstall packages which are not in use. The Add/Remove Software application helps you to install or uninstall packages.

Perform the following steps to install and uninstall a package using the Add/Remove Software application:

1. *Select* **System→Administration→Add/Remove Software**, as shown in Fig.Linux-6.27:

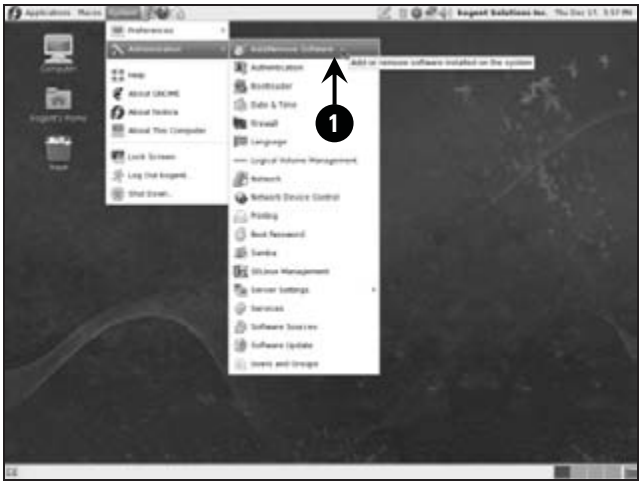


Fig.Linux-6.27

The **Add/Remove Software** window appears, as shown in Fig.Linux-6.28:



Fig.Linux-6.28

The left pane of the window shows various categories of software packages, such as Multimedia, Education, Graphics, and Games (Fig.Linux-6.28).

2. *Type* a word or phrase related to the package that you want to install in your system. In our case, we have typed **encoder** (Fig.Linux-6.29).
3. *Click* the **Find** button {Fig.Linux-6.29).

   The searched result is exhibited in the display area of the Add/Remove Software window (Fig.Linux-6.30).



Fig.Linux-6.29



Fig.Linux-6.30

You can select the desired package by selecting the check box from the window (Fig.Linux-6.30).

4. *Select* one or more package list from the display area. In our case, we have selected the **A graphical Audio CD ripper and encoder** check box (Fig.Linux-6.31). As soon as, you select a package, the **Apply** button enables.
5. *Click* the **Apply** button (Fig.Linux-6.31).

   A message box appears asking you to download an additional package required to install the selected package (Fig.Linux-6.32).
6. *Click* the **Install** button (Fig.Linux-6.32).

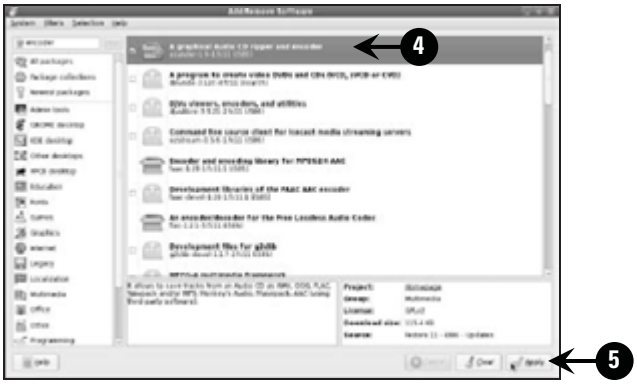


Fig.Linux-6.31



Fig.Linux-6.32

The Authenticate dialog box is appears that asks you to enter the root password. As soon as you enter the root password, the **Add/Remove Software** application automatically starts getting information about the package, resolving package dependencies, and downloading and installing the package (Fig.Linux-6.33). This entire process takes a few minutes.

The **Add/Remove Software** window now downloading the package (Fig.Linux-6.33).

When the package is installed, a message box appears that allows you to run the software package directly. However, you can close it and start later whenever required. The complete path to start the software package is provided by the message box. For example, the path to open audio CD ripper application is **Applications→Sound and video→Asunder CD Ripper**.

7. *Click* the **Close** button to close the message box (Fig.Linux-6.34).



Fig.Linux-6.33

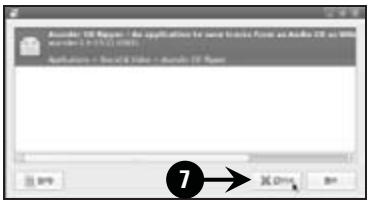


Fig.Linux-6.34

The Add/Remove Software window appears again. You can see that the software package that you have installed appears as the selected in the display area of the window (Fig.Linux-6.35).

Perform the following steps to uninstall a package:

8. *Clear* the **A graphical Audio CD ripper and encoder** check box by clicking it (Fig.Linux-6.35).

   The **Apply** button is enabled (Fig.Linux-6.36).

9. *Click* the **Apply** button to uninstall the selected package (Fig.Linux-6.36).



Fig.Linux-6.35

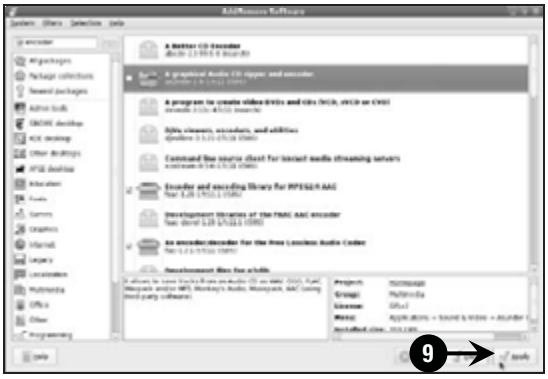


Fig.Linux-6.36

The Add/Remove Software application is uninstalling the selected package. You have to wait for few seconds or minutes depending upon the size of the package, as shown in Fig.Linux-6.37:



Fig.Linux-6.37

When the uninstallation process ends, you find that the check box beside the **A graphical Audio CD ripper and encoder** option is cleared, as shown in Fig.Linux-6.38:



Fig.Linux-6.38

The clear check box means that the package is uninstalled from your system (Fig.Linux-6.38).

Let's now learn about Red Hat Package Manager (RPM).

Exploring Different Red Hat Package Manager (RPM) Packages

Red Hat Package Manager is a powerful package manager, which is used to install, upgrade, and remove packages in Linux. The RPM package is used for various Linux distributions. For example, both Mandriva and SUSE (SELinux) Linux distributions use RPM for software management. RPM enables you to install, upgrade, and uninstall software on Linux, as well as keep track of already installed RPM packages on your system. The RPM packages include the package version, such as vi 0.98-2.i386.rpm along with the .rpm extension. RPM has the following advantages:

- Provides the best way for users to install and remove programs with a single command.
- Provides an easy way to transport a package from one system to another.
- Handles dependency checks automatically. The RPM package includes a database of all the packages you have installed and provides the information for each package.

Table 6.1 lists the RPM package commands:

Table 6.1: Commands of RPM Packages	
Symbol	**Description**
rpm -qa	Enables you to see the list of installed packages on your system
rpm -qa | grep	Lists the packages whose names contain a specific word
rpm -ivh filename.rpm	Installs a specified package
rpm -Uvh filename.rpm	Upgrades an installed package
rpm -e packagename	Enables you to uninstall a package

You can view a list of packages present in your system by using the **rpm -qa** command given in the preceding table.

Perform the following steps to view a list of packages installed already in your system.

1. *Select* **Applications→System Tools→Terminal** (Fig.Linux-6.39).
   The Terminal window appears (Fig.Linux-6.40).
2. *Type* the **su –** command to enter in the root mode and *press* the **ENTER** key (Fig.Linux-6.40).
3. *Type* root password and then *press* the **ENTER** key (Fig.Linux-6.40).

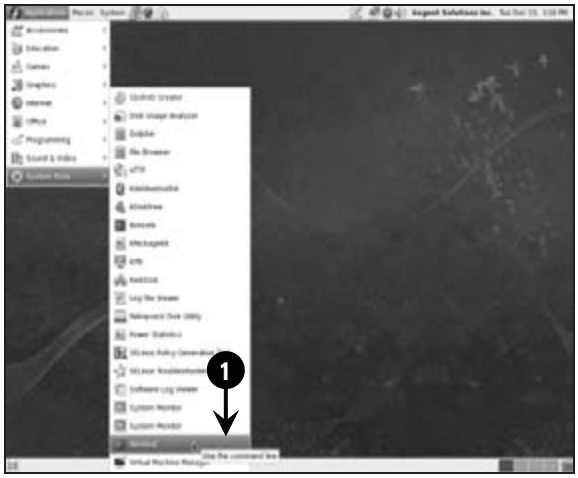


Fig.Linux-6.39

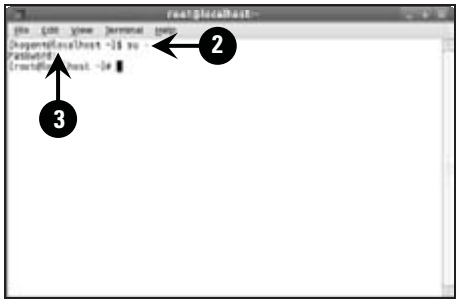


Fig.Linux-6.40

4. *Type* the **rpm -qa** command in the command line to list the installed packages of your system (Fig.Linux-6.41).
5. *Press* the **ENTER** key. List of installed packages appears (Fig.Linux-6.42).

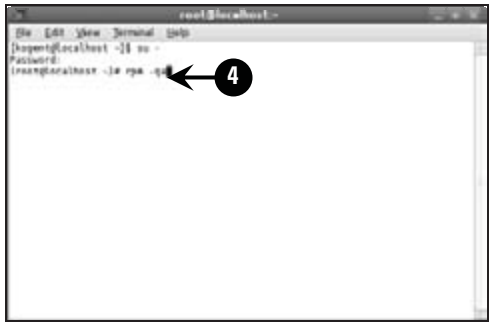


Fig.Linux-6.41



Fig.Linux-6.42

Let's now learn to install an RPM package.

Installing an RPM Package

You can install a package by running the RPM command, rpm -ivh filename.rpm. Before installing an RPM package, you need a CD that contains the package or it should be stored in your hard disc. In our case, the package is stored in the hard disc. While installing a package through command line, you can access the package by reaching the directory where the package is stored.

Perform the following steps to install an RPM package:

1. *Type* **cd /home/kogent/Download** in the command line to go to the current directory where the RPM package is stored and *press* the **ENTER** key. You are in the Download sub-directory (Fig.Linux-6.43).
2. *Type* the ls command to list the content inside the Download sub-directory. The list of various files and packages inside the Download sub-directory appears (Fig.Linux-6.44).



Fig.Linux-6.43

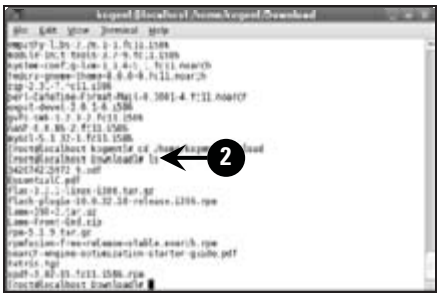


Fig.Linux-6.44



We have manually download the xpdf-3.02-15.fc11.i586.rpm package and stored in the Download sub-directory.

3. *Type* the rpm -ivh xpdf-3.02-15.fc11.i586.rpm command to install the package that is stored in the Download folder (Fig.Linux-6.45).
4. *Press* the ENTER key. The RPM package starts installing. You have to wait for few seconds or minutes depending upon the size of the package. When the package gets installed, the Terminal window shows the 100 percent completeness of the installation process (Fig.Linux-6.46).

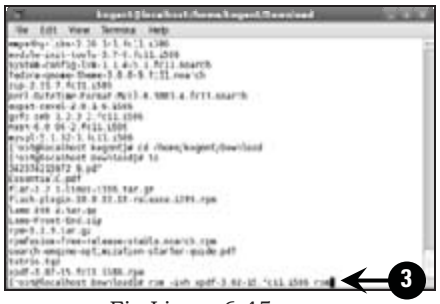


Fig.Linux-6.45



Fig.Linux-6.46

Let's now learn to uninstall an RPM package.

Uninstalling an RPM Package

You can uninstall an RPM package that is not in use with the help of rpm -e packagename command.

Perform the following steps to uninstall an RPM package:

1. *Type* the **rpm -e flash-plugin** command to uninstall the flash-plugin package (Fig.Linux-6.47).

2. *Press* the **ENTER** key. The package is uninstalled automatically and the next command line appears (Fig.Linux-6.48).



Fig.Linux-6.47



Fig.Linux-6.48

Let's now learn to open a PDF file with the help of Adobe Acrobat.

Opening a PDF File using Adobe Acrobat

You can also open the Portable Document Format (PDF) documents with Linux. The documents in this format appear on the screen exactly same as they would appear in print. This format allows you to embedded objects, such as pictures and tables in the documents. You can also add bookmarks for better navigation and hyperlinks to access the World Wide Web (WWW) pages.

The Xpdf program of Linux allows you to access the PDF documents. It is a PDF viewer that you need to install in your system. We have already installed xpdf-3.02-15.fc11.i586.rpm package in the preceding section.

Perform the following steps to open a PDF file on your system:

1. *Select* **Applications→Graphics→Xpdf PDF Viewer**, as shown in Fig.Linux-6.49:

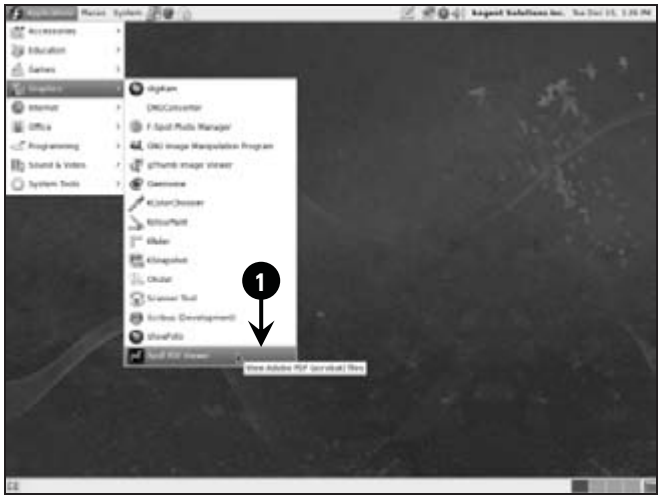


Fig.Linux-6.49

The Xpdf window appears (Fig.Linux-6.50).

2. *Place* the mouse-pointer anywhere inside the **Xpdf** window, and *right-click*. A context-menu appears (Fig.Linux-6.51).
3. *Select* the **Open** option from the context menu (Fig.Linux-6.51).



Fig.Linux-6.50



Fig.Linux-6.51

The **Xpdf: Open** dialog box appears (Fig.Linux-6.52).

4. *Select* the location, where you have stored your PDF files from the **Directories** list box. In our case, it is **/home/kogent/Download/** (Fig.Linux-6.52).
5. *Select* a PDF file from the **Files** list box. In our case, the selected file is **search-engine-optimization-starter-uide.pdf** (Fig.Linux-6.52).
6. *Click* the **Open** button (Fig.Linux-6.52).
   The selected PDF file is opened in the Xpdf window (Fig.Linux-6.53).
7. *Click* the **Close** button in the Title bar of the Xpdf window after reading the file (Fig.Linux-6.53).

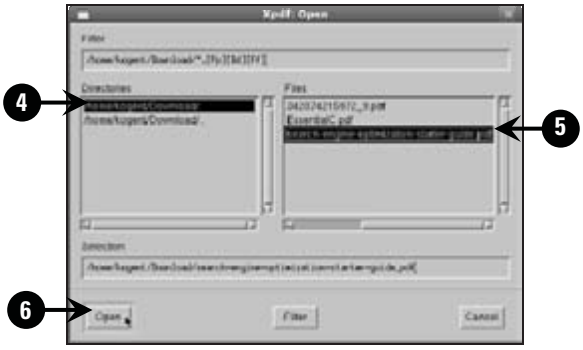


Fig.Linux-6.52



Fig.Linux-6.53

In the preceding section, you have learned to open an PDF file using the Xpdf application. Let's now learn to work with music and video files in Linux.

Working with Music and Video

Listening music or playing a video is one of the most enjoyable activities for people. It has become quite easy to play and manage your music and video files with the enhancements of the multimedia tools, such as movie and music player. Linux provides you such applications that are helpful to perform several activities, such as playing, recording, and extracting music and video files. In Linux, Music and video applications support various file formats, such as audio, MP3, Moving Picture Experts Group (MPEG), Audio Video Interleave (AVI), and Waveform (WAV) audio formats.

In this section, you learn to manage sound controls and explore Sound Juicer, Totem Movie Player, and Rhythmbox Music Player.

Managing Sound Controls

Sounds of different audio channels can be adjusted according to the requirement. This adjustment is made by using different options available in PulseAudio Volume Control Applet. It is an open-source software that can be installed easily in your system.

Perform the following steps to adjust the sound:

1. *Select* **Applications→Sound and Video→PulseAudio Volume Control**, as shown in Fig.Linux-6.54:

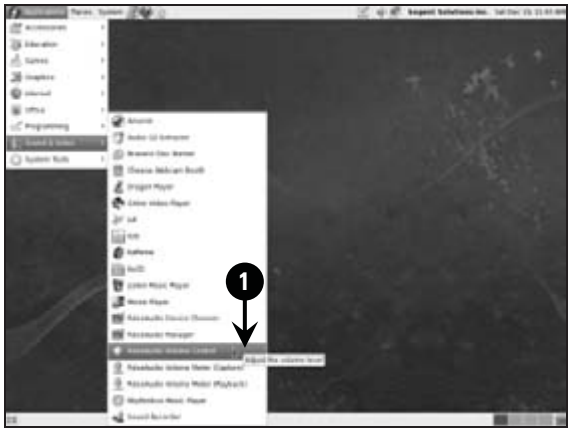


Fig.Linux-6.54

The **Volume Control** window appears (Fig.Linux-6.55).

2. *Select* the **Output Devices** tab (Fig.Linux-6.55).
3. *Adjust* the volume according to the requirement by dragging the **Front Left** and **Front Right** sliders (Fig.Linux-6.55).
4. *Click* the **Close** button on the Title bar of the Volume Control window to close it, as shown in Fig.Linux-6.55:



Fig.Linux-6.55

In the preceding section, you have learned to manage the sound controls. Let's now learn about Sound Juicer.

Exploring Sound Juicer

Sound Juicer is an application in the GNOME desktop used to extract audio files from the audio compact discs (CDs) and change them into such a file format that is understandable and playable in your system. It is free and open source software and also known as a CD ripping tool. When you install Linux in your system, it is installed automatically in your system. You can play the audio tracks directly from the audio CD with the help of Sound Juicer. It also helps you to preview the audio CD before extracting the CD into your system.

Entering Track Data

When you insert an audio CD in your system's CD/DVD drive, and open it with Sound Juicer, all the music tracks are shown in Sound Juicer. However, information, such as title and artist names may be known or unknown. It depends upon whether these things are entered at the time of CD writing or not.

Therefore, before extracting the audio into your system, you can enter information, such as the names of titles, artists, and genres. This helps you to identify music tracks.

Perform the following steps to open Sound Juicer and enter track data of the music:

1. *Select* **Applications→Sound and Video→Audio CD Extractor** (Fig.Linux-6.56).
   The **Sound Juicer** window appears (Fig.Linux-6.57).

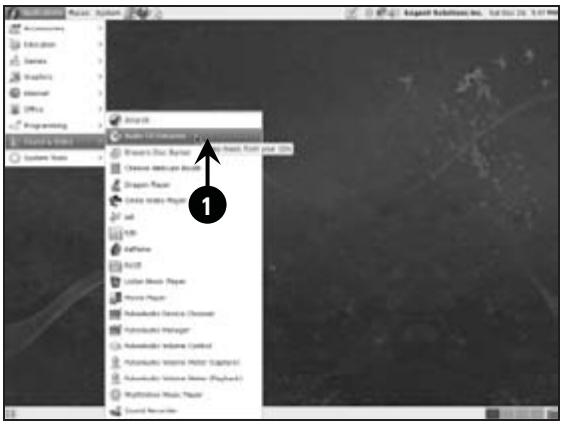


Fig.Linux-6.56

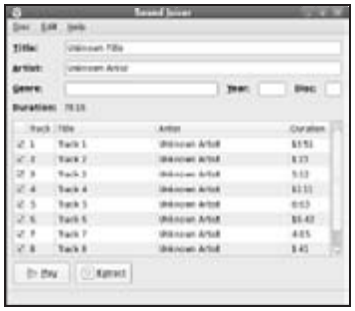


Fig.Linux-6.57

   The **Sound Juicer** window appears with the blank fields, such as title, artist, and genre. You can enter these names before extracting the music files.
2. *Type* the title name in the **Title** text box. In our case, it is **Sufi Musics** (Fig.Linux-6.58).
3. *Type* the artist name in the **Artist** text box. In our case, it is **Muzaffar Ali**. When you enter name and click outside the text box or press the ENTER key, the artist name corresponding with every track is updated (Fig.Linux-6.58).



You can provide a distinct artist name for every track. This can be done by selecting the track first and then type the artist name corresponding with each music track.

4. *Type* a category of music in the **Genre** text box (Fig.Linux-6.58). In our case, it is **Sufi**.
5. *Type* year in the **Year** text box if you want to enter (Fig.Linux-6.58). In our case, it is 2009.
6. *Type* the disk number in the **Disc** text box if you are extracting the music from more than one CD. In our case, the disk number is 1, as shown in Fig.Linux-6.58:

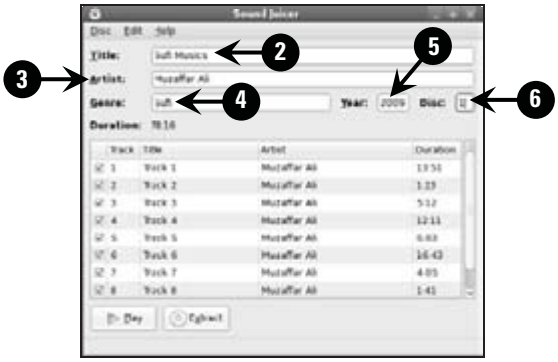


Fig.Linux-6.58

Now you have learned to enter the track data of music files.

Let's now extract the music tracks from the CD to your computer.

Extracting the Music Tracks

You can extract all of the tracks or selected tracks on the CD to audio files. The extracted music files are stored in the default directory known as Music in your system. We are procedding from the Fig.Linux-658. Perform the following steps to extract the tracks on the CD to audio files:

1. *Select* the tracks that you want to extract. In our case, all the tracks are selected (Fig.Linux-6.59).
2. *Click* the **Extract** button (Fig.Linux-6.59).

   The process of extracting the music tracks starts. The Extract button converts into the Stop button. The progress bar shows the total progress and estimated time left in the Status bar of the window (Fig.Linux-6.60). The Sound Juicer window displays an icon beside the track number that is currently extracting (Fig.Linux-6.60).

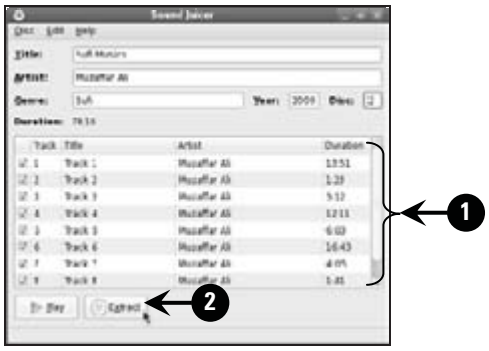


Fig.Linux-6.59



Fig.Linux-6.60

As soon as the first track gets extracted, the icon jumps to the next track. This process continues till all the tracks get extracted. You can stop the process of extracting the tracks by clicking the Stop button.

When all the tracks are extracted, the Stop button converts into the Extract button, as shown in Fig.Linux-6.61:

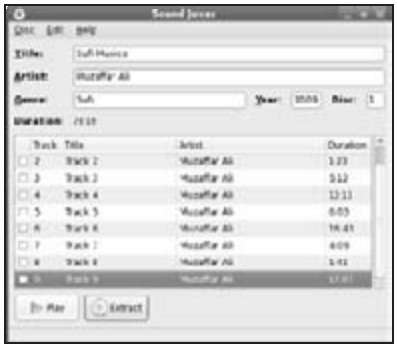


Fig.Linux-6.61

Let's now learn to play a track on CD.

Playing a Track on a CD

After extracting music tracks, you can play the music from the location where you have saved it or directly from a CD.

Perform the following steps to play a track on a CD:

1. *Select* a track from the list of tracks. In our case, the selected track is **Track 5** (Fig.Linux-6.62).
2. *Click* the **Play** button to play the selected track (Fig.Linux-6.62).

   The selected track starts playing (Fig.Linux-6.63).

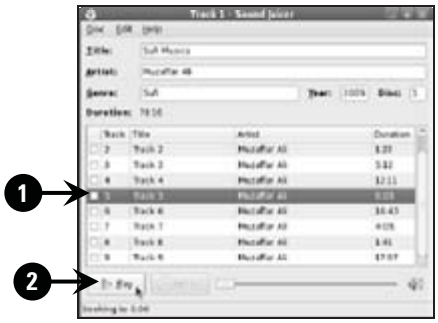


Fig.Linux-6.62



Fig.Linux-6.63

3. *Click* the **Pause** button to pause a track while it is playing, as shown in Fig.Linux-6.64:



Fig.Linux-6.64

Let's now learn about the preferences.

Setting the Preferences of Sound Juicer

You can set the preferences of Sound Juicer whenever required. For example, if you are using more than one CD/DVD drive in your system, you need to set which particular CD/DVD drive your Sound Juicer use. You can also use other options, such as ejecting the CD when Sound Juicer has extracted all the tracks and setting format for extracted music files.

Perform the following steps to set the preferences of Sound Juicer:

1. *Click* the **Edit** menu on the Menu bar. A drop-down menu appears (Fig.Linux-6.65).
2. *Select* the **Preferences** option from the drop-down menu, as shown in Fig.Linux-6.65:

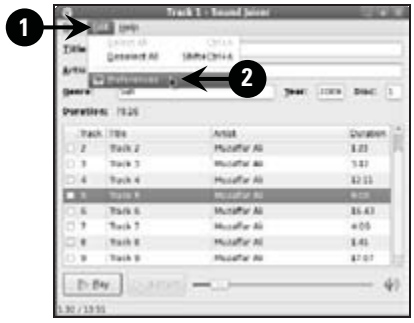


Fig.Linux-6.65

The **Preferences** dialog box appears (Fig.Linux-6.66).

3. *Select* a CD/DVD drive from the **CD drive** list box provided by your Sound Juicer if your system uses more than one CD/DVD drive. In our case, only one drive is available (Fig.Linux-6.66).

4. *Select* the **Eject after extracting tracks** check box to allow Sound Juicer to eject CD when the extracting process completes (Fig.Linux-6.66).
5. *Select* the **Open music folder when finished** check box to open the music folder when the extracting of music tracks finishes (Fig.Linux-6.66).
6. *Click* the down arrow in the **Folder** list box (Fig.Linux-6.66).

   A list of folders appears (Fig.Linux-6.67).
7. *Select* a folder where you want to save the extracted music files. In our case, it is the default folder, **Music** (Fig.Linux-6.67).

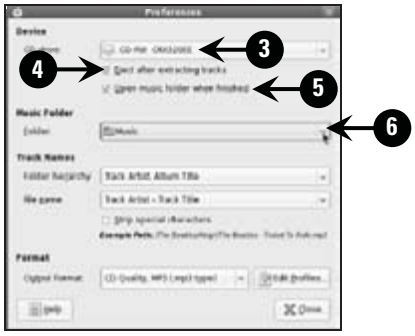


Fig.Linux-6.66



Fig.Linux-6.67

8. *Click* the down arrow in the **Folder hierarchy** list box to select a folder hierarchy that your music folder contains (Fig.Linux-6.68).
9. *Select* a folder hierarchy option from the drop-down list. In our case, it is **Album Title** (Fig.Linux-6.69).



Fig.Linux-6.68

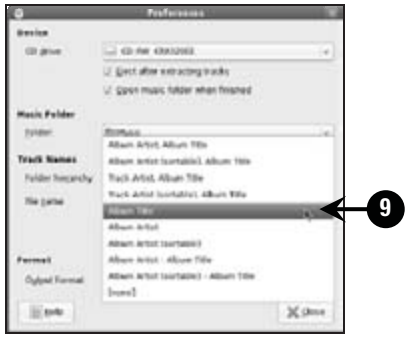


Fig.Linux-6.69

10. *Click* the down arrow to select a file name in the **File name** list box, as shown in Fig.Linux-6.70:



Fig.Linux-6.70



Fig.Linux-6.71

A drop-down list appears (Fig.Linux-6.71).

11. *Select* a style of file name to be used to save the file after extracting it. In our case, it is **Number Track Artist - Track Title** (Fig.Linux-6.71).
12. *Click* the down arrow in the **Output Format** list box to select an output format (Fig.Linux-6.72).
    A drop-down list appears (Fig.Linux-6.73).
13. *Select* a format that you want for music files after extracting. In our case, it is **CD Quality, Lossless (flac type)** (Fig.Linux-6.73).



Fig.Linux-6.72



Fig.Linux-6.73

14. *Click* the **Close** button to close the **Preferences** dialog box (Fig.Linux-6.74).
    As soon as you click the Close button, you return back to the Sound Juicer window.
15. *Click* the **Close** button to close the **Sound Juicer** window (Fig.Linux-6.75).



Fig.Linux-6.74



Fig.Linux-6.75

The Sound Juicer window is closed and you return back to desktop.

Exploring Totem Movie Player

Totem Movie Player is an application used to play audio and video media files in the GNOME desktop environment. It is based on a multimedia framework known as Gstreamer and multimedia library known as xine. This framework helps to support different media formats, such as MPEG, AVI, and WMV. Totem Movie Player supports different audio and video file formats. This movie player provides you various facilities, such as zoom levels, aspect ratios, a full-screen view, control to adjust the volume of movies or songs, and a playlist of movies and songs.



Aspect ratio is the ratio of a longer and shorter dimension of an image.

Let's start with launching Totem Movie Player.

Launching Totem Movie Player

When you install Linux in your system, Totem Movie Player is installed automatically. However, you need to install some plug-ins, such as Gstreamer and audio and video encoder/decoder to play various media files.

1. *Select* **Applications→Sound and Video→Movie Player**, as shown in Fig.Linux-6.76:

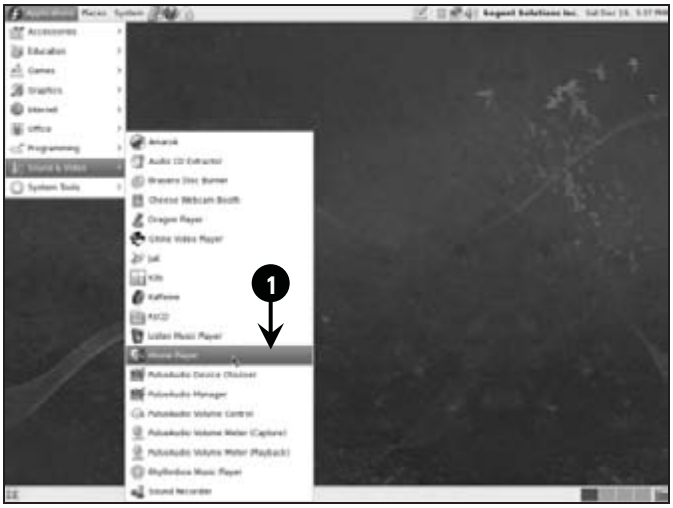


Fig.Linux-6.76

The Totem **Movie Player** window appears, as shown in Fig.Linux-6.77:



Fig.Linux-6.77

Let's explore the interface of Totem Movie Player.

Understanding the Totem Movie Player Interface

Before proceeding to work with Totem Movie Player, let's first discuss its interface. Totem Movie Player consists of the following components:

- **Menu bar:** Contains a host of menus that helps you to perform basic operations in Totem Movie Player. For example, the Movie menu helps you to open music files and locations where files are stored. In addition, the View menu helps you to view the movie in a full-screen view.

- **Display area**: Displays the movie or song that you are currently playing.
- **Side bar:** Displays the properties and playlists of media files.
- **Elapsed time slider:** Displays the amount of elapsed time of the currently playing song or movie.
- **Seek control buttons:** Help you to play/pause a movie and go to previous or next movie.
- **Volume buttons:** Help in adjusting the volume level of the movie or song.
- **Status bar:** Shows the information about the status of the currently playing song or movie.

After learning about the interface of Totem Movie Player, let's now learn to work with a video.

Working with a Video

After getting familiar with the interface of Totem Movie Player, you can open a song or movie, and perform other tasks, such as controlling volume level and move the tracks forward and backward. Let's now play a video song in Totem Movie Player.

Playing Video

You can play a video saved in the hard disc or from the CD/DVD of movies and songs. Perform the following steps to play a video:

1. *Click* the **Movie** menu on the Menu bar. A drop-down menu appears (Fig.Linux-6.78).
2. *Select* the **Open** option from the drop-down menu, as shown in Fig.Linux-6.78:

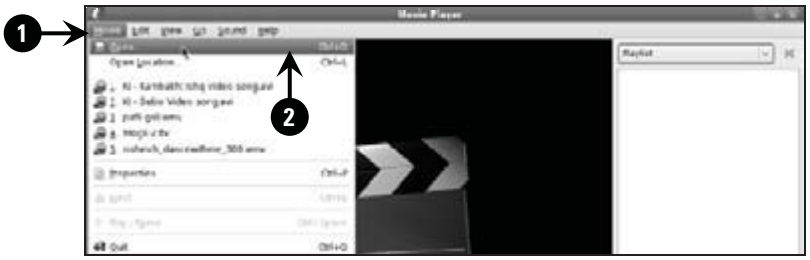


Fig.Linux-6.78

The **Select Movies or Playlists** dialog box appears (Fig.Linux-6.79).

3. *Select* the folder where you have stored the movies and songs. In our case, it is the **Music** folder (Fig.Linux-6.79).
4. *Select* a video song that you want to play (Fig.Linux-6.79). In our case, it is **KI-Kambakht ishq video song.avi.**
5. *Click* the **Add** button from the dialog box (Fig.Linux-6.79).

The selected song starts playing in the Display area of Totem Movie Player (Fig.Linux-6.80).



Fig.Linux-6.79



Fig.Linux-6.80

Let's now learn how to pause a video that is currently playing.

Pausing a Video

While playing a movie or song, sometimes you require to pause it so that you can again start it from where you have left it. You can do it by using the Pause button.

1. *Click* the **Pause** button present on the bottom of the window, as shown in Fig.Linux-6.81:



Fig.Linux-6.81

As soon as you click the Pause button, the video pauses and the pause button converts to the Play button.



You can eject a video CD, DVD, or VCD, by selecting Movie→Eject from Totem Movie Player

Let's now learn to set the preferences of Totem Movie Player in the next section.

Setting the Preferences of Totem Movie Player

You can customize the setting of Totem Movie Player. For example, you can change the display settings, such as brightness and contrast of the video. You can also change the audio settings, such as the audio output type.

Perform the following steps to set the preferences:

1. *Click* the **Edit** menu on the Menu bar (Fig.Linux-6.82). A drop-down menu appears (Fig.Linux-6.82).
2. *Select* the **Preferences** option from the drop-down menu (Fig.Linux-6.82).

   The **Preferences** dialog box appears (Fig.Linux-6.83).
3. *Click* the down arrow in the **Connection speed** list box under the **Networking** section to change the speed of the network connection (Fig.Linux-6.83).



Fig.Linux-6.82



Fig.Linux-6.83

A list of connection speed options appears (Fig.Linux-6.84).

4. *Select* a connection speed from the list. In our case, it is the **56 Kbps Modem/ISDN** option (Fig.Linux-6.84)
5. *Select* the **Automatically load subtitle files when movie is loaded** check box under the **Text Subtitles** section to automatically load any of the subtitle files with the file name being the name of the movie (Fig.Linux-6.85).
6. *Click* the **Font** list box (Fig.Linux-6.85).

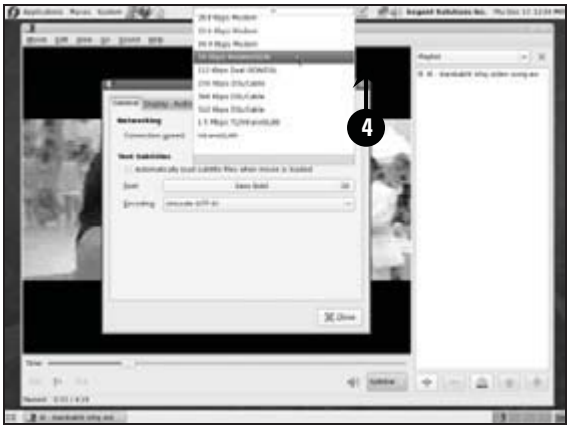


Fig.Linux-6.84



Fig.Linux-6.85

The **Select Subtitle Font** dialog box appears (Fig.Linux-6.86).

7. *Select* a font from the **Family** list box. In our case, it is **Sans** (Fig.Linux-6.86).
8. *Select* a font style from the **Style** list box. In our case, it is **Bold Italic** (Fig.Linux-6.86).
9. *Select* a font size from the **Size** list box. In our case, the font size is **18** (Fig.Linux-6.86).
10. *Click* the **OK** button (Fig.Linux-6.86).

    Again the **Preferences** dialog box appears (Fig.Linux-6.87).
11. *Select* an option from the **Encoding** list box to set the encoding used for displaying the subtitle. In our case, we have selected **Unicode (UTF-8)** (Fig.Linux-6.87).
12. *Click* the **Display** tab (Fig.Linux-6.87).



Fig.Linux-6.86

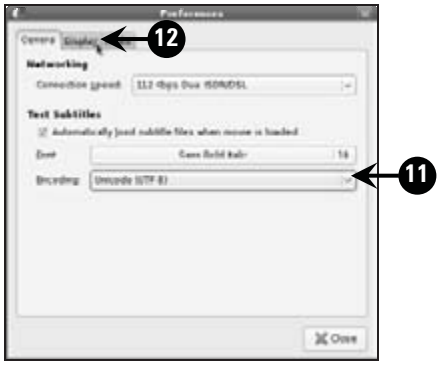


Fig.Linux-6.87

13. *Select* the **Automatically resize the window when a new video is loaded** check box under the **Display** section if you want that Totem Movie Player automatically resizes window on the basis of the size of the video when it is loaded (Fig.Linux-6.88).
14. *Select* the **Allow the screensaver to activate even when audio-only is playing** under the **Display** section if you want to activate screensaver at the time when you are playing audio files (Fig.Linux-6.88).
15. *Select* the **Show visual effects when an audio file is played** check box to display the visual effects in case an audio file is loaded (Fig.Linux-6.88).
16. *Click* the down arrow from the **Type of visualisation** list box (Fig.Linux-6.88).

    A drop-down list appears containing the two categories of visualization (Fig.Linux-6.89). These options create a visualisation for audio songs based on the incoming audio signal.

17. *Select* a category of visualisation from the drop-down list. In our case, it is **GOOM: what a GOOM! 2K1 edition** (Fig.Linux-6.89).



Fig.Linux-6.88

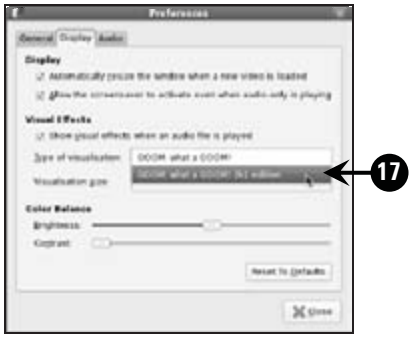


Fig.Linux-6.89

18. *Click* the down arrow given in the **Visualisation size** list box (Fig.Linux-6.90).
    A drop-down list appears (Fig.Linux-6.91).
19. *Select* a visualisation size from the drop-down list. In our case, it is Large (Fig.Linux-6.91).

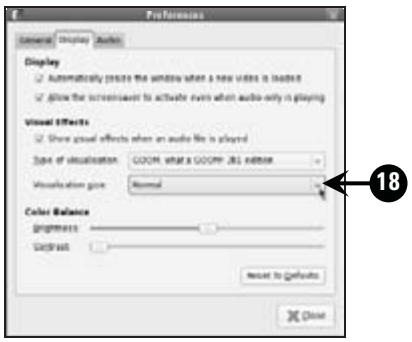


Fig.Linux-6.90

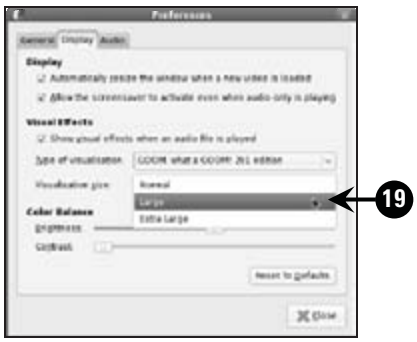


Fig.Linux-6.91

20. *Drag* the **Brightness** slider towards right or left to increase or decrease the brightness of the video (Fig.Linux-6.92).
21. *Drag* the **Contrast** slider towards right or left to increase or decrease the contrast of the video (Fig.Linux-6.92).
22. *Click* the **Audio** tab (Fig.Linux-6.92).
23. *Select* an audio output from the **Audio output type** list (Fig.Linux-6.93).



Fig.Linux-6.92



Fig.Linux-6.93

24. *Click* the **Close** button (Fig.Linux-6.94).
    Totem Movie Player appears again (Fig.Linux-6.95).
25. *Click* the **Close** button to close the movie player (Fig.Linux-6.95).



Fig.Linux-6.94



Fig.Linux-6.95

Let's now learn about Rhythmbox Music Player.

Exploring Rhythmbox Music Player

Rhythmbox Music Player is used to play and organize digital music. It supports different music file formats and display information on songs with the help of metadata reading. It also helps you to present songs in an organized view and listen to the Internet radio stations. It can also read and create audio CDs by selecting the songs from the playlist.

Launching Rhythmbox Music Player

When you install Linux in your system, Rhythmbox Music player is installed automatically.

1. *Select* **Applications→Sound and Video→Rhythmbox Music Player**, as shown in Fig.Linux-6.96:

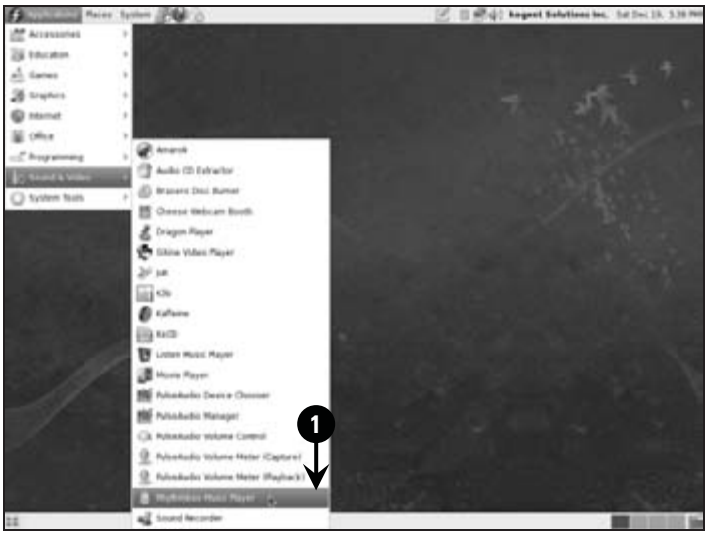


Fig.Linux-6.96

The Music player window appears, as shown in Fig.Linux-6.97:

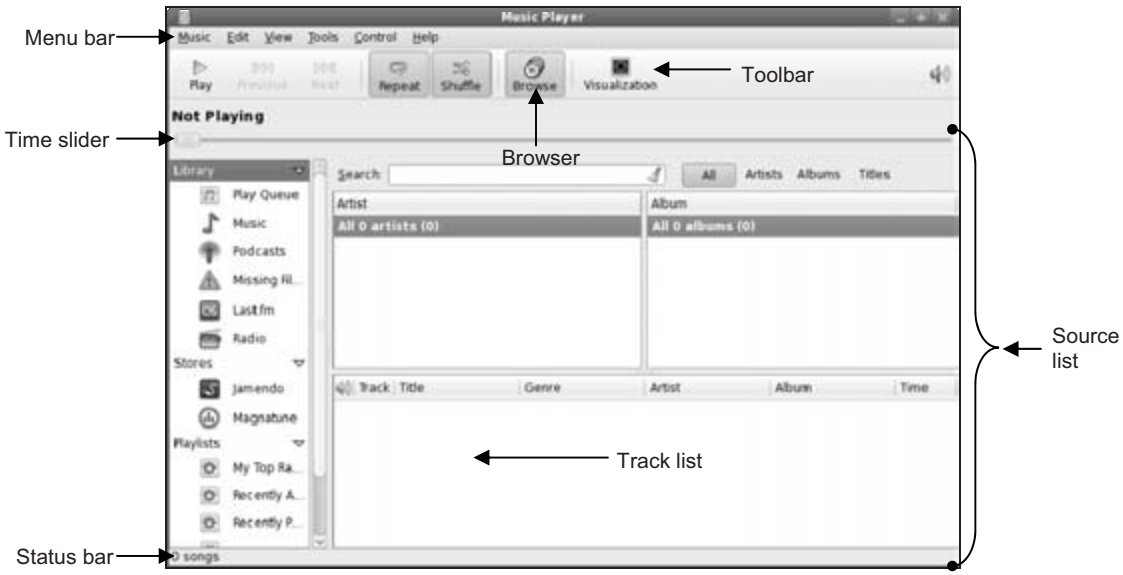


Fig.Linux-6.97

After launching Rhythmbox Music Player, let's now learn its interface.

Understanding the Rhythmbox Music Player Window

Before learning to work with Rhythmbox Music Player, let's first discuss its interface. Rhythmbox Music Player consists of the following components:

- **Menu bar:** Contains a host of menus that helps you to perform various tasks, such as importing, cutting, copying, and pasting music files.
- **Toolbar:** Contains control buttons that provide access to perform several activities, such as playing/pausing, browsing, and visualizing music.
- **Time slider:** Shows the elapsed time of the currently playing audio.
- **Source list:** Shows the list of the available sources.
- **Browser:** Lets you browse and filter the library tracks by artist, album, or genre name.
- **Tracks list:** Displays the tracks that belong to the selected source.
- **Status bar:** Displays status information about the selected source in the source list.

Working with a Music Track

In an album, there can be a number of music tracks. You can select any music track and play it. In addition, you can pause the music track whenever required. Let's now learn how to play a music track from Rhythmbox Music player.

Playing a Music Track

After getting familiar with the interface of Rhythmbox Music Player in the preceding section, you can play the music. However, to play the music, you should have either music stored in your hard disc or an audio CD or MP3 CD. In our case, we are playing music through CD. As soon as, you insert an audio CD or MP3 CD in your CD/DVD ROM, Rhythmbox Music Player automatically extracts the music files and displays them on the source list. The source list contains artist and album lists of the music files. You can select a music file either artist or album wise.

Perform the following steps to play a music track:

1. *Select* a music category from the **Artist** or **Album** list box. In our case, we have selected **All 7 albums (21)** option (Fig.Linux-6.98).
2. *Select* a specific album. In our case, we have selected the **3 Idiots (7)** option. All the music tracks under the **3 Idiots (7)** album appear in the **Tracks** list (Fig.Linux-6.99).

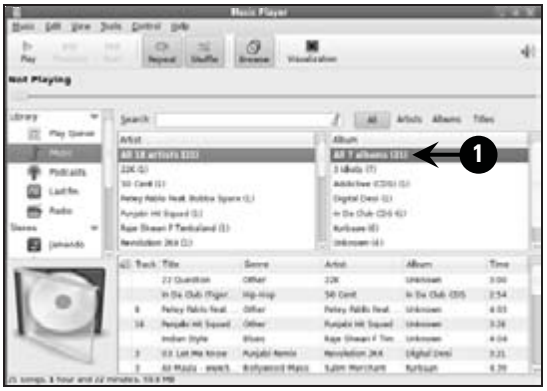


Fig.Linux-6.98

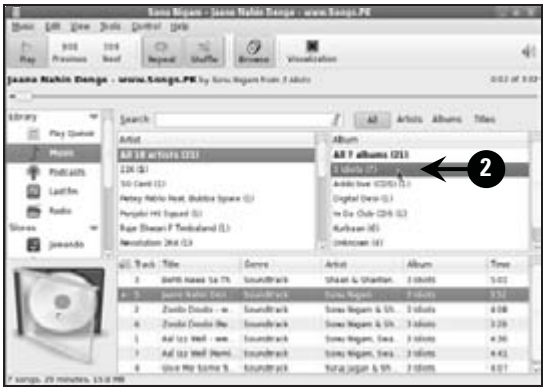


Fig.Linux-6.99

As soon as you select a music album, a music track under that category starts playing automatically. However, you can select a music track of your own choice.

3. *Double-click* the music track that you want to play. In our case, we have selected **Track 1** (Fig.Linux-6.100).

   As soon as, you double-click the music track, it starts playing (Fig.Linux-6.101).



Fig.Linux-6.100



Fig.Linux-6.101

Whenever required, you can pause the music track by clicking the Stop playback button from Rhythmbox Music Player.

Using the Player Toolbar

The Toolbar of Rhythmbox Music Player provides the access to the basic functions, such as playing or pausing the music tracks, selecting next or previous music track to the current track. Fig.Linux-6.102 shows the Toolbar of Rhythmbox Music Player:



Fig.Linux-6.102

The following are the controls present on the Toolbar of Rhythmbox Music Player:

- **Play/Pause:** Refers to the control button that plays the selected track. When the music starts playing, this button becomes the Pause button.
- **Previous:** Plays the previous music track to the current track.
- **Next:** Plays the next music track to the current music track.
- **Repeat:** Starts again the first music track when all the music tracks are played.
- **Shuffle:** Plays the music track in random order.
- **Browse:** Changes the visibility of the browser. For example, by clicking this control button, the source list that contains Album, and Artist or Genre may appear or disappear.
- **Visualization:** Starts or stops the visualization effect of the music.

Setting the Preferences of Rhythmbox Music Player

You can customize the setting of Rhythmbox Music Player, such as you can change the visible columns in the track list or change the source list among the Artists and Albums, Genres and Artists, and Genres, Artists, and Albums.

Perform the following steps to set preferences of Rhythmbox Music Player:

1. *Select* the **Edit** menu on the Menu bar (Fig.Linux-6.103). A drop-down menu appears (Fig.Linux-6.103).
2. *Select* the **Preferences** option from the drop-down menu (Fig.Linux-6.103).

   The **Music Player Preferences** dialog box appears (Fig.Linux-6.104).
3. *Select* a radio button under **Browser Views** to show these options in the Source list. In our case, we have selected the **Artists and albums** radio button (Fig.Linux-6.104).
4. *Select* the check boxes for the options that you want to display in the Tracks list of the Music Player window under **Visible Columns**. In our case, we have selected the **Track number**, **Artist**, **Album**, **Time,** and **Genre** check boxes (Fig.Linux-6.104).
5. *Click* the down arrow in the **Toolbar Button Labels** list box (Fig.Linux-6.104).



Fig.Linux-6.103



Fig.Linux-6.104

A drop-down list appears (Fig.Linux-6.105).

6. *Select* an option to set the labels of Toolbar button from the drop-down list. In our case, we have selected **Text below icons** (Fig.Linux-6.105).

   You can set the options under the Playback, Music, and Podcasts tabs. For example, you can set the options, such as enabling crossfading and duration and type of crossfading. A crossfading is a method of editing two audio files that makes smooth transition between them. Under the Music tab, you can set the options, such as library location and structures of music files. Under the Podcasts

tab, you can set the option, such as downloading the podcasts location. Podcasting is a method that is used to broadcast the audio content over the Web.

7. *Click* the **Close** button in the dialog box (Fig.Linux-6.106).



Fig.Linux-6.105



Fig.Linux-6.106

The dialog box is closed and you return back to Rhythmbox Music Player (Fig.Linux-6.107).

8. *Click* the **Close** button on the Title bar to close the Rhythmbox Music Player, as shown in Fig.Linux-6.107:

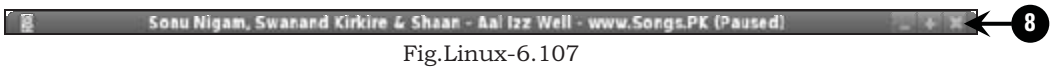


Fig.Linux-6.107

With this we come to the end of the chapter, let's summarize the main points of this chapter in the following section.

Summary

In this chapter, you have learned to work with a text editor that helps you to create, save, and close a document. You have also learned to open and modify an existing document. Further, you have learned to install and uninstall a package. Finally, you have explored music and video applications in which you have learned about an audio CD extractor (Sound Juicer), Totem Movie Player, and Rhythmbox Music Player.

CHAPTER

7

Gaming in Linux

In this Chapter:

- Introducing Hardware Requirements for Linux Gaming
- Exploring Linux Games in GNOME and KDE Desktop
- Starting a GNOME Linux Game
- Starting a KDE Linux Game
- Introducing Commercial Game in Linux
- Playing Game Using Cedega 6.0

A few years ago, games can be played only in Windows operating system. Now a days every type of Windows gaming as well as some new games, such as Lagno and Robots are also available in Linux operating system. You can also play online 3D games using the 3D graphics card, which provides high speed and improved visual quality for the game.

In this chapter, you learn about the hardware requirements to play games in Linux. You explore different games available in GNOME and KDE desktop. After getting familiar with games you learn to play games in GNOME and KDE. Finally, you learn to play commercial games in Linux using Cedega.

Let's start with Linux gaming.

Introducing Hardware Requirements for Linux Gaming

The computer hardware devices such as mouse, keyboard, and joystick to enhance the capability to play games. If the computer does not meet the hardware requirement of a game then that particular game cannot be played on that system. it. However, your computer should fulfill the basic hardware requirement to avoid situations, such as game and sound problems. So, it is always advisable to choose advanced configuration for your computer so that it meets requirements of present as well as future needs. In hardware configuration, RAM, a high speed processor, and extra disk space is required for playing games than needed for most Linux applications.

Table 7.1: shows the hardware requirements required for the Linux gaming:

Table 7.1: Hardware Requirements for Linux gaming

Hardware Requirements	Recommendation
RAM	Minimum:1 GB Recommended: 2 GB
Hard Disk Space	160 GB
Processor	1 GHz
Video Card Drivers	NVIDIA and ATI



NVIDIA and ATI are graphic processors that enhance the display capability of PC with low configuration up to ten times than similar systems.

After learning about the hardware requirements for the Linux gaming, now let's explore the GNOME and KDE games.

Exploring Linux Games in GNOME and KDE Desktop

There are two main desktop environments for Linux, GNOME and KDE (described in chapter 3 and 2) each have set of games associated with it. Both of these desktops consist of different types of games that you can play whenever you want. In his section, you learn the Linux games in GNOME and KDE desktop.

Let's begin with the Linux games in GNOME desktop first.

Exploring Linux Games in GNOME Desktop

The GNOME desktop offers you more than a dozen games, such as, AisleRoit Solitaire, Blackjack, Chess, and many other games. Games are quite useful when you want to give yourself a break from busy office or work schedule. Nowadays, many interactive games are available in market, which help kids to expand their knowledge level and practice typing.

Table 7.2 shows the Linux GNOME desktop games along with their descriptions:

Table 7.2: GNOME Games

Game	Description
AisleRiot Solitaire	Refers to a collection of different solitaire card games.

Table 7.2: GNOME Games	
Game	**Description**
Blackjack	Refers to a multiple deck, casino rules game, where you try to hold cards with highest count, 21 (without going over)
Chess	Refers to square chess board game that consists of 64 squares of alternating colors (Black and white). It can be played in 2D or 3D view against the computer.
Five or More	Refers to a game in which you have to align five moving balls around a grid to form a straight line. Once you align five moving balls in a row, the line disappears.
Four-in-a-Row	Refers to a game in which a user scores by placing four discs in a row.
FreeCell Solitaire	Consists of similar games as solitaire card games.
GnomeFallingBlocks	Consists of blocks, which are available in seven different shapes. You need to create complete horizontal lines of blocks that disappear later.
Lagno	Provides the GNOME version of Rerversi. The purpose of the game is to control most of the disks on the board.
Klotski	Refers to sliding block puzzle game in which you have to align moving blocks in such a way that a straight line of single color is built.
Mahjongg	Dissembles the piles of tiles by removing the matching pairs.
Mines	Refers to a puzzle game, where you need to locate mines floating in an ocean.
Nibbles	Consists of a worm that moves around the screen, eating diamonds while avoiding walls, which are placed around it. With each diamond the worm grows longer and navigation becomes more and more difficult. Four people can play this game at a time.
Robots	Refers to the classic robots game where you have to avoid a hoard of robots who are trying to kill you. Each step you take brings robots closer to you.
Same GNOME	Clears the screen by removing the group of color balls.
Sudoku	Contains grid puzzles in which you have to test your logical skills. In this game you have to fill the grid with numbers instead of words.
Tali	Contains a poker style dice game, which is similar to an ancient Roman game Yahtzee.
Tetravex	Refers to a puzzle game where you have to match a grid of tiles with each other. The skill level ranges from the simple two by two grids up to the seriously mind-bending six by six grids.

Now let's learn about KDE Desktop games.

Exploring Linux Games in KDE Desktop

The KDE desktop environment provides lot of games, which you can play in your leisure time or when you need a break from routine work. In Fedora and other Linux distributions these games come with KDE games package.

Table 7.3 shows you the list of available KDE Games in Linux:

Table 7.3: KDE Games	
Game	**Description**
Kapman	Refers to the clone of pacman game. In this you have to eat pills by escaping from the ghosts. As you tend to lose a life if the ghosts eat you. But, you can also eat ghosts for a few seconds while eating an energizer.
KAtomic	Refers to molecular geometry game in which the player needs to re-assemble the scattered molecules around the field and then move up to the next level. This game provides both fun and education.

Table 7.3: KDE Games

Game	Description
KBattleship	Refers to a battle ship game for KDE desktop. In this game the player tries to hit other ships, which are placed on a board. The player who destroys all ships first, wins the game.
KBlackBox	Refers to the game of hide and seek, which is played on the grid of boxes. It is a logical game, which is inspired by the emacs blackbox.
KBlocks	Refers to a game in which a player has to fill the entire line with falling blocks.
KBounce	Refers to an arcade game with the elements of puzzle. It is played on a field, surrounded by walls, with two or more balls that move around the field bouncing at a distance from walls.
KBreakout	Refers to a game where the player has to break the bricks without losing balls.
KDiamond	Refers to a puzzle game in which a player needs to place three similar diamonds in a line.
KFourInLine	Refers to a two player board game. In this game the player has to build a row of four oval shaped pieces, which are placed on a board.
KGoldrunner	Refers to a game in which the player needs to rescue the hero of the game by showing a run away path through a maze. While running through maze, the hero must collect all gold nuggets without falling in the hands of enemies to proceed to the next level.
Killbots	Refers to a simple game of evading killer robots.
Kiriki	Refers to a dice game, which can be played between six players. In this game, each participant has to collect points by rolling five dices for three times in a single turn.
KJumpingCube	Refers to a simple tactical game in which playing area consists of squares containing points. You can play it against the computer or a friend.
KMahjongg	Refers to a tile matching game for one or two players, in player you have to select the matching tiles to remove them.
KMines	Refers to the clone of classical Minesweeper game. The idea is to uncover all the squares without blowing up any mines. If a mine is blown, the game is over.
KNetWalk	Refers to a logic game in which the player has to start the Local Area Network (LAN), connecting all the terminals to the server, in as few turns as possible.
Kolf	Refers to a miniature golf game with 2d top-down view.
Kollision	Refers to a simple ball dodging game.
Kolor Lines	Refers to the game in which, the player has to move the colored balls around the game board, arranging five balls of same color into a single line.
Konquest	Refers to the space odyssey game in which the player sends his ships to other planets and conquers them.
KPatience	Refers to a card game in which the player must put the cards in a special order by moving, turning, and reordering the cards.
KReversi	Refers to a strategic game played against the computer. The playing field is an 8 by 8 square board divided into 64 squares.
Ksirk	Refers a computerized version of a well known strategic game, Risk.
KspaceDuel	Refers to a space game in which the player has to control the navigation path of a satellite orbiting the sun and protect it from falling into the core of the sun.

Table 7.3: KDE Games	
Game	**Description**
KSquares	Refers to a game in which the player has to interconnect the dots on the grid to make a square.
Ksudoku	Refers a simple number based puzzle game. In this game a player has to fill a grid with numbers 1 through to 9 listed just once.
Kubrick	Refers to a puzzle game, which was invented by professor Erno Rubik in Hungary in 1970s.
LSkat	The game is played using a single deck of cards. Cards are shuffled and distributed amongst the players in such a way that half of them are faced down and half of them are open. Each participant plays one of the open cards per turn. As soon as all the cards are played, the round ends and points are calculated and awarded.
Potato Guy	This game is a constructor game and the idea is based on doll making concept. This game is good for children in which you have to decorate a potato with various small artifacts to make it look similar to a tiny person.

After learning about the KDE game, now let's learn about starting the GNOME Linux game.

Starting a GNOME Linux Game

The Linux GNOME desktop provides more than forty games. In case you are about to play a new game then first of all read instructions to play the game and then only proceed ahead towards playing the game. In this section, you learn to play Nibbles and Mahjongg games.

Playing Nibbles

Nibbles is a game where the user controls a worm through keyboard keys or gaming devices such as a joystick. The main aim of the game is to eat as many diamonds as possible while protecting the worm smashing against the wall.

Let's perform the following steps to start Nibbles:

1. *Select* the **Applications** menu from the top panel of the GNOME desktop. A drop-down list appears (Fig.Linux-7.1).
2. *Select* the **Games** option from the drop-down list. A submenu appears (Fig.Linux-7.1).
3. *Select* the **Nibbles** option from the sub-menu, as shown in Fig.Linux-7.1:

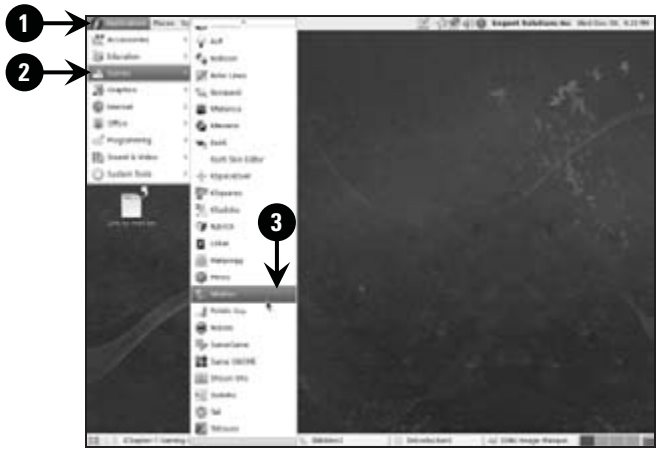


Fig.Linux-7.1

The Nibbles window opens (Fig.Linux-7.2).

4. *Select* the **Game** menu from the menu bar. A drop-down list appears (Fig.Linux-7.3).
5. *Select* the **New** option from the list to start the game (Fig.Linux-7.3).



Fig.Linux-7.2

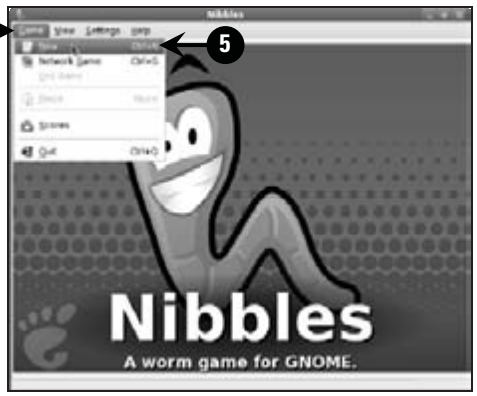


Fig.Linux-7.3

As you select the New option, the game gets started, as shown in Fig.Linux-7.4:

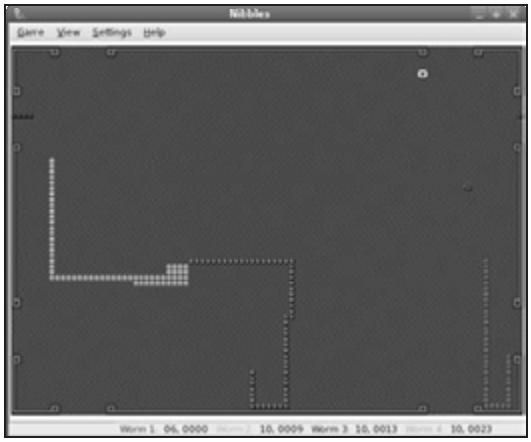


Fig.Linux-7.4

Use the arrow keys of the keyboard to navigate the worm and help it in eating food without colliding with walls and obstacles.

After learning to play Nibbles, let's proceed ahead and learn to play Mahjongg.

Playing Mahjongg

GNOME Mahjongg or Mahjongg in short, is a solitaire (one player) version of the classic Eastern tile game, Mahjongg. It is a tile or card game. You can change the appearance of tiles, such as background of the tiles, level of the games as well as the color of the background of the Mahjongg window by using the Preferences dialog box in the Setting menu. You can also undone the previous step using the undo move feature in the games menu.

You start with five levels of tiles, which are stacked or covered up by the tiles on top. The harder the level you set in the Preferences dialog box, the more tiles are covered when the game starts. The objective of GNOME Mahjongg is to remove all the tiles from the game. You have to find matching pairs that look alike to remove tiles. A matching tile usually has the same number of buttons or markings on it or looks similar to the other tile.

Let's perform the following steps to play the Mahjongg Game:

1. *Select* the **Applications** menu from the top panel of the Linux desktop. A drop-down list appears (Fig.Linux-7.5).
2. *Select* the **Games** option from the list. A sub-menu appears (Fig.Linux-7.5).
3. *Select* the **Mahjongg** option from the list (Fig.Linux-7.5).

   The Mahjongg window appears (Fig.Linux-7.6).

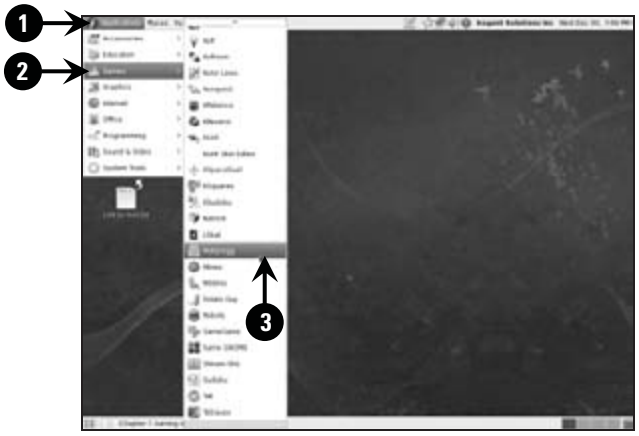


Fig.Linux-7.5



Fig.Linux-7.6

Mahjongg is played by clicking on two matching tiles that are removed on clicking. Play continuously until all the tiles are removed or there are no available pairs. For example we have clicked the **1st** tile in the very first row and the **12th** tile from the last row located in the bottom of the game. As you click on **1st** tile in the first row, it becomes selected and when you click the **12th** tile from the last row, both the tiles disappear from the rows (Fig.Linux-7.7).

4. *Select* the **Game** menu from the menu bar. A drop-down list appears (Fig.Linux-7.8).
5. *Select* the **Undo Move** option, to undone the previous step (Fig.Linux-7.8).



Fig.Linux-7.7



Fig.Linux-7.8

The removed tile re-appears again (Fig.Linux-7.9).

6. *Select* the **Settings** menu from the menu bar. A drop-down list appears (Fig.Linux-7.10).
7. *Select* the **Preferences** option from the list (Fig.Linux-7.10).



Fig.Linux-7.9



Fig.Linux-7.10

The **Mahjongg Preferences** dialog box opens (Fig.Linux-7.11).

8. *Click* the down arrow button beside the **Tile set** list box in the **Tiles** category. A drop-down list appears (Fig.Linux-7.12).
9. *Select* the **smooth** option from the drop-down list (Fig.Linux-7.12).
10. *Click* the down arrow button beside the **Select map** list box under the **Maps** category. A drop-down list appears (Fig.Linux-7.13).
11. *Select* the desired option from the list. In our case, we have selected **Red Dragon** (Fig.Linux-7.13).



Fig.Linux-7.11



Fig.Linux-7.12



Fig.Linux-7.13

As you select this map, a message box appears asking whether you want to start new game using this map (Fig.Linux-7.14).



This message box appears in case, when we change the settings in between playing the game or the game is started.

12. *Click* the **Use new map** button, as shown in Fig.Linux-7.14:



Fig.Linux-7.14

13. *Click* the color picker beside the **Background color** option, under the **Colors** category (Fig.Linux-7.15).
14. *Select* the desired color from the **Pick a Color** dialog box . In our case, we have selected **brown** color (Fig.Linux-7.16).

15. *Click* the **OK** button, to apply the desired color (Fig.Linux-7.16).

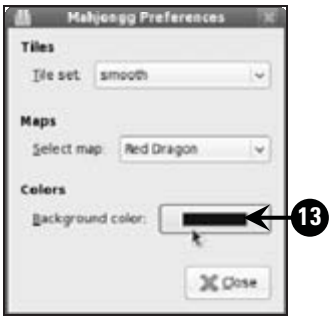


Fig.Linux-7.15



Fig.Linux-7.16

The Mahjongg Preferences dialog box appears (Fig.Linux-7.17).

16. *Click* the **Close** button, to close this dialog box (Fig.Linux-7.17).

The Mahjongg Preferences dialog box gets closed and the Mahjongg window appears with the applied settings (Fig.Linux-7.18).



Fig.Linux-7.17



Fig.Linux-7.18

After learning about playing the GNOME games, let's learn KDE games.

Starting a KDE Linux Game

You can play various types of games in KDE, as mentioned earlier. In this section, you learn to play the Kblocks game. KBlocks is the classic falling blocks game. The idea is to stack the falling blocks in a way that lines are completely filled. When a line is completed it is removed, and more space is available in the play area. When there is not enough space for blocks to fall, the game gets over. You can use the right-left and down arrow buttons to move and place the blocks in the desired line.

Let's perform the following steps to play the KDE Kblocks:

1. *Select* the **Applications** menu from the top panel of the GNOME desktop. A drop-down list appears (Fig.Linux-7.19).
2. *Select* the **Games** option from the list. A sub-menu appears (Fig.Linux-7.19).
3. *Select* the **KBlocks** option from the sub-menu (Fig.Linux-7.19).

The Kblocks window appears and game starts (Fig.Linux-7.20).

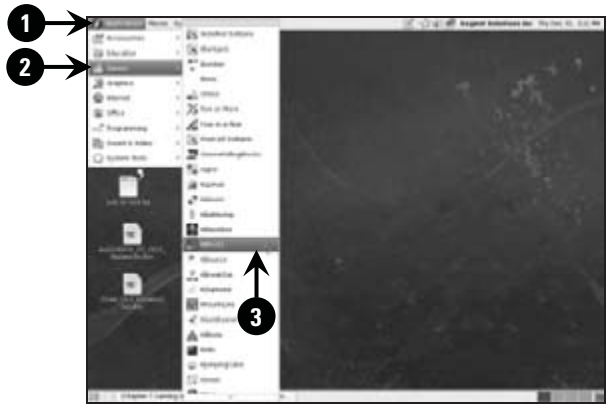


Fig.Linux-7.19



Fig.Linux-7.20

4. *Fill* the line with the falling blocks using the left-right and down arrow keys (Fig.Linux-7.21).
5. *Select* the **Games** menu from the menu bar. A drop-down list appears (Fig.Linux-7.22).
6. *Select* the **Pause** option to pause the game (Fig.Linux-7.22).

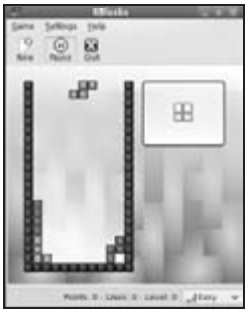


Fig.Linux-7.21

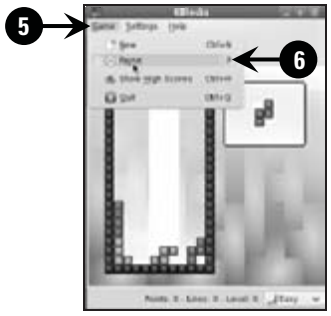


Fig.Linux-7.22

The game pauses (Fig.Linux-7.23).

7. *Click* the **Pause** button in the toolbar of the KBlocks window, to resume the game (Fig.Linux-7.24).



Fig.Linux-7.23

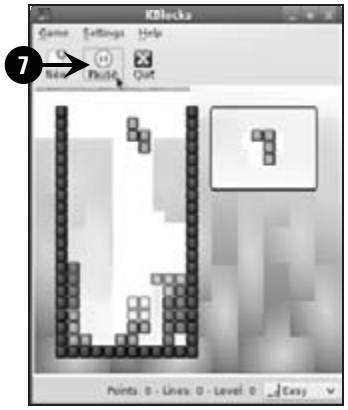


Fig.Linux-7.24

The game resumes (Fig.Linux-7.25).

As you fill the appropriate line in using the falling blocks, you score points (Fig.Linux-7.26).

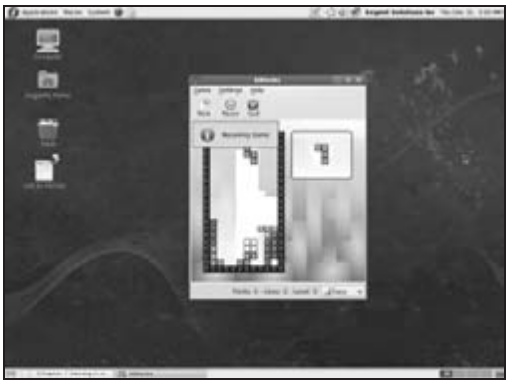


Fig.Linux-7.25



Fig.Linux-7.26

8. *Click* the **Settings** menu from the menu bar. A drop-down list appears (Fig.Linux-7.27).
9. *Select* the **Difficulty** option from the list to select the level for the game, which is set **Easy** by default. A sub-menu appears (Fig.Linux-7.27).
10. *Select* the desired level for the game. In our case, we have selected the **Medium** level (Fig.Linux-7.27). A new game starts with medium level (Fig.Linux-7.28).

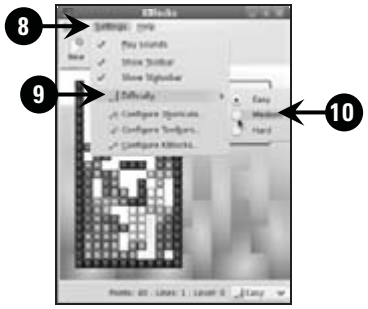


Fig.Linux-7.27



Fig.Linux-7.28



When you select the level a message box appears with warning that the current game will stop. We have to click the Change the difficulty level button to change the level and start new game.

After learning to play a KDE game, let's learn to play commercial game in Linux.

Introducing Commercial Game in Linux

Linux operating system allows you to play commercial games in Linux. Cedega software is used to implement Windows operating system API on Linux with an emphasis of games compatibility. In this section, you learn to play the game using the Cedega software.

Playing Game Using Cedega 6.0

Cedega 6.0 provides high quality graphics with improved sound and performance. Cedega allows hundreds of Windows games to run on Linux seamlessly and transparently. Cedega runs on most major Linux distributions including (but not limited to): Linspire, Mandriva, SuSE, Gentoo, Ubuntu, Fedora, Debian, and Slackware (These Linux distributions has been described in chapter-1). TransGaming technology offers Linux some of the most popular games that currently run on windows operating system. You need to download the Cedega software to play windows games in Linux. You can download the Cedega software from www.trasngaming.com site.

After installing this software, you can access it with the help of the following steps:

1. *Select* the **Applications** menu from the top panel of GNOME desktop. A drop-down list appears (Fig.Linux-7.29).
2. *Select* the **Games** option from the list. A sub-menu appears (Fig.Linux-7.29).
3. *Select* the **Cedega Gaming Services** option from the sub menu, as shown in Fig.Linux-7.29:



Fig.Linux-7.29

As you select this service, **Cedega Updater** dialog box appears that checks for the Cedega updates (Fig.Linux-7.30).

when it checks all the updates regarding the Cedega services, then **Cedega** window appears in which the Spore Creature Creator Trial Edition game is selected by default (Fig.Linux-7.31).

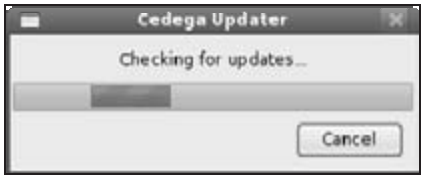


Fig.Linux-7.30

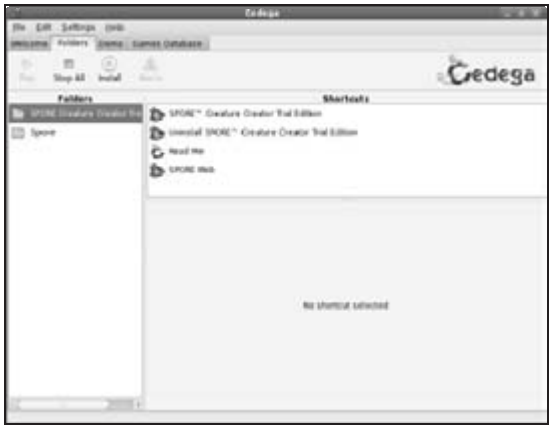


Fig.Linux-7.31

With this we come to the end of the chapter. Before moving towards the next chapter, let's refresh the summary of the chapter.

Summary

In this chapter, you have learned about Linux games. You have also learned about the hardware requirements for gaming in Linux. Further, you have learned about the games in GNOME and KDE desktop environment. In addition, you have learned to play GNOME games, such as Nibbles and Mahjongg in GNOME desktop. Apart from GNOME games you have also learned to play KDE games such as KBlocks. Finally, you have learned to play commercial games in Linux using the Cedega software.

CHAPTER



Introducing Educational Tools in Linux

In this Chapter:

- Exploring a Suite of Educational Tools
- Introducing Dictionary
- Speeding up with Typing Tutorials
- Introducing OpenGL Globe-Earth Simulation for Linux
- Introducing Desktop Planetarium

Education in a broadest way is an act or experience that has a formative effect on mind, character, and physical ability of an individual. It enhances your thinking power and knowledge. You can acquire education through various forms, such as by listening, reading, and playing. Fedora Linux provides a number of educational tools that helps you learn various activities, which enhance your typing speed, learning abilities, and drawing skills. The basic purpose of these educational tools is to learn through the process of fun.

In this chapter, you learn about a suite of educational tools that consists of activities for kids 2-10 years old and a geometry tool that can be used to work with mathematical figures. Next, you learn about the Fantasdic dictionary application. You also learn about typing tutorials, GNU's Not Unix (GNU) and TUX, which help you to increase your typing speed. In the end, you learn about the OpenGL Globe-Earth Simulator and desktop planetarium applications.

Let's start by learning about a suite of educational tools.

Exploring a Suite of Educational Tools

Fedora Linux provides you a suite of educational tools. In this suite, the fun based learning activities are available for each age group with the special focus on children of the age group 2-10. The suite consists of different education games, such as falling dices, falling words, and basic algebra. It also allows you to perform activities, such as creating and manipulating geometrical figures.

We are discussing two tools of educational suite namely, education suite for 2-10 years old and interactive geometry, in the following sections.

Let's begin by exploring an educational suite for kids 2-10 years old.

Education Suite for Kids 2-10 Years Old

The educational suite available for kids 2-10 years old is the GCompris application. This suite laid emphasis on learning through planning. The GCompris application provides various games for the children 2 to 10 years old. The interface of this application is easy to use.

Perform the following steps to start the GCompris application:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.1).
2. *Select* the **Education** option. A sub menu appears (Fig.Linux-8.1).
3. *Select* the **GCompris Educational suite** option, as shown in Fig.Linux-8.1:



Fig.Linux-8.1

The GCompris application opens, as shown in Fig.Linux-8.2:



Fig.Linux-8.2

The interface of the GCompris application consists of the following components:

- **Title Bar:** Displays the name of the application.
- **Icons Section:** Refers to the yellow section that appears on the left side of the interface. It displays the icons for various fun based graphical learning activities, such as amusement, reading, and mathematical activities.
- **Workspace:** Refers to the area where you can play the selected activity. This area also displays the icons of different activities selected in the icons section. You can view the description of any icon by placing the mouse pointer over it.
- **Description section:** Refers to the blue section that appears at the bottom of the workspace. It displays a brief description of the selected activity.
- **Menu Section:** Consists of buttons that allow you to quit the application, see credits, configure the application, and access the help.

The activities in the GCompris application are divided into the following eight categories:

- **Amusement activities:** Consists of fun activities, such as football, tux paint, word processor, and chat applications. The activities present in the **Amusement activities** category (Fig.Linux-8.3).
- **Reading activities:** Consists of activities, such as missing letter, image name, and vertical-reading practice. All these activities enhance your comprehension and ability to remember. The activities present in the **Reading activities** category (Fig.Linux-8.4).



Fig.Linux-8.3



Fig.Linux-8.4

- **Strategy games:** Consists of games, such as chess and connect 4, which help you in increasing your concentration ability. The activities present in the **Strategy games** category (Fig.Linux-8.5).
- **Discovery activities:** Consists of miscellaneous memory related activities, such as coloring and maze activities. The activities present in the **Discovery activities** category (Fig.Linux-8.6).



Fig.Linux-8.5



Fig.Linux-8.6

- **Discover the Computer:** Consists of activities related to mouse and keyboard. When you click on the mouse or the keyboard a sub category of activities gets displayed. The activities present in the **Discover the Computer** category (Fig.Linux-8.7).
- **Mathematics:** Consists of activities that are arithmetical in nature and are based on numbers and measurements. The activities present in the **Mathematics** category (Fig.Linux-8.8).



Fig.Linux-8.7



Fig.Linux-8.8

- **Puzzles:** Consists of various puzzles, such as assembling the pieces, building the same model, and Sudoku. The activities present in the Puzzles category (Fig.Linux-8.9).
- **Experiential activities:** Consists of activities, such as parachutist, electricity, and sea race. The activities present in the **Experiential activities** category (Fig.Linux-8.10).



Fig.Linux-8.9



Fig.Linux-8.10

Let's now learn how to use geometry application in Linux.

Interactive Educational Geometry in Linux

Linux provides you an interactive educational geometry application known as Dr.Geo. The Dr.Geo application is one of the educational tools, which is based on mathematics and focuses on the students from primary to secondary level. It lets you create geometrical figures, such as circles, straight lines, line segments, and arcs, and also allows you to manipulate these figures in an interactive manner. You can also measure the distance between the line segments and any two points on a same plane by using different options that are available in the Dr.Geo application. In addition, you can also measure the angle of any figure. In our case, we are drawing a triangle and measuring its line segments and one of its angles.

Perform the following steps to start the Dr.Geo application:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.11).
2. *Select* the **Education** option. A sub menu appears (Fig.Linux-8.11).
3. *Select* the **Dr.Geo** option, as shown in Fig.Linux-8.11:

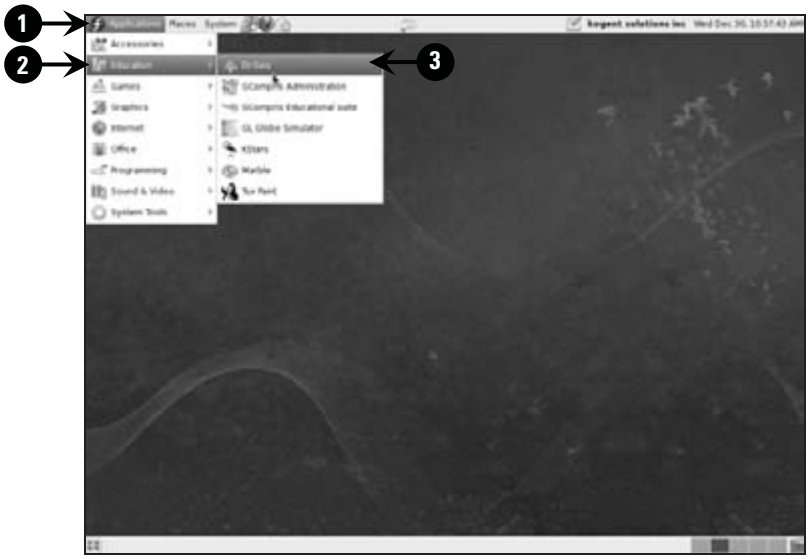


Fig.Linux-8.11

The Dr.Geo application opens (Fig.Linux-8.12).

4. *Click* the new figure icon to create a new figure (Fig.Linux-8.12).
   A new workspace with different tools for drawing a figure appears (Fig.Linux-8.13).
5. *Click* the **Show/hide** icon to show the grid lines (Fig.Linux-8.13).



Fig.Linux-8.12



Fig.Linux-8.13

You can also open a workspace for drawing a new figure by navigating the following menu path:
Click File→New→Figure

The grid lines appear (Fig.Linux-8.14).

6. *Right-click* on the blank space on the workspace. A context-menu appears (Fig.Linux-8.14).
7. *Select* the **Point** option. A sub menu appears (Fig.Linux-8.14).
8. *Select* the **Free point** option (Fig.Linux-8.14).
9. *Click* anywhere on the blank workspace to place the points for a figure. In our case, we have placed three points (Fig.Linux-8.15).
10. *Click* the line segment icon (Fig.Linux-8.15).

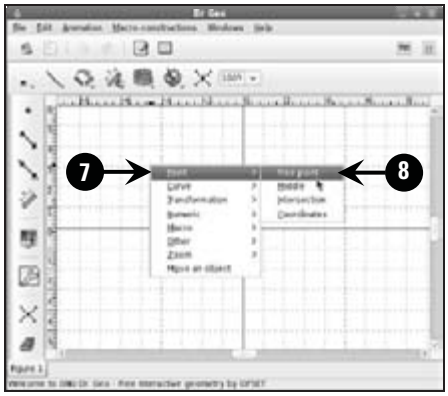


Fig.Linux-8.14

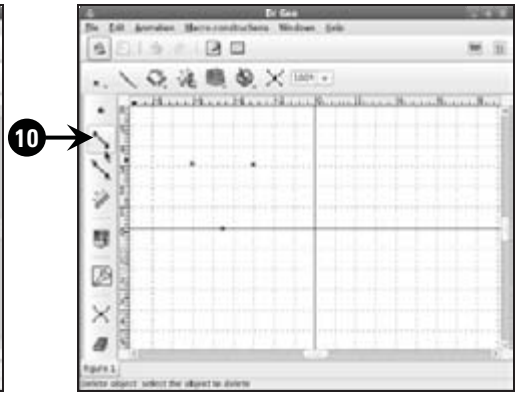


Fig.Linux-8.15

11. *Click* the first point (Fig.Linux-8.16).
12. *Click* the second point (Fig.Linux-8.17).

A line segment is drawn (Fig.Linux-8.17).

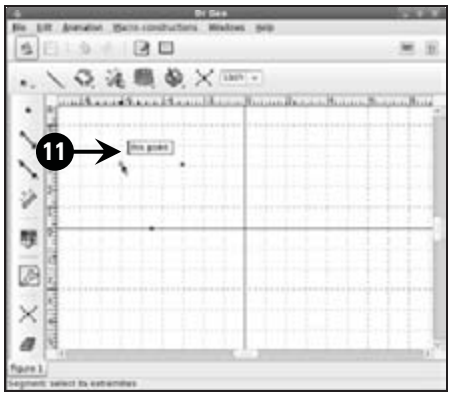


Fig.Linux-8.16

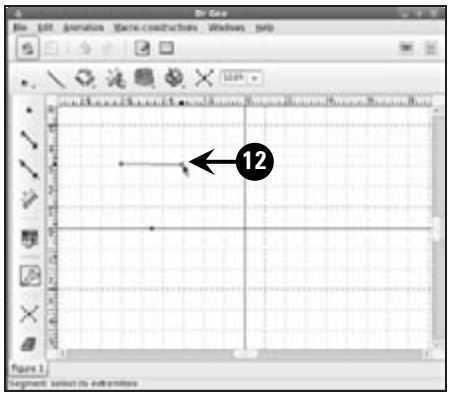


Fig.Linux-8.17

13. Similarly, draw another two line segments by clicking the respective points. In our case, a triangle is formed (Fig.Linux-8.18).

Now, let's learn to measure the line segments of a figure. In our case, we are measuring the line segments of the triangle (Fig.Linux-8.18).

14. *Click* the measurement icon (Fig.Linux-8.18).
15. *Select* the line segment that you want to measure (Fig.Linux-8.19).

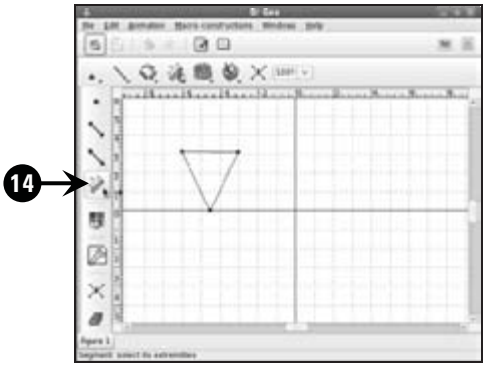


Fig.Linux-8.18

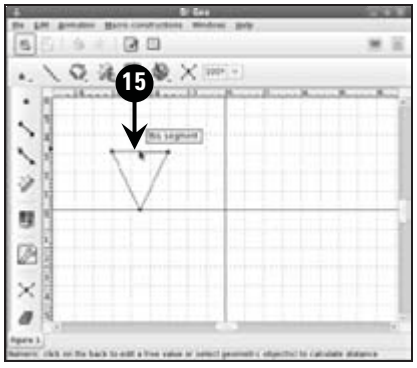


Fig.Linux-8.19

The measurement of the line segment appears (Fig.Linux-8.20).

16. *Select* the line segment that you want to measure (Fig.Linux-8.20).
    The measurement of the second line segment appears (Fig.Linux-8.21).
    Similarly, you can measure the third line segment by selecting it.
    Let's continue with the following steps to measure the angle of a given figure:
17. *Click* the down-arrow of the **Create numeric object** icon (Fig.Linux-8.21).

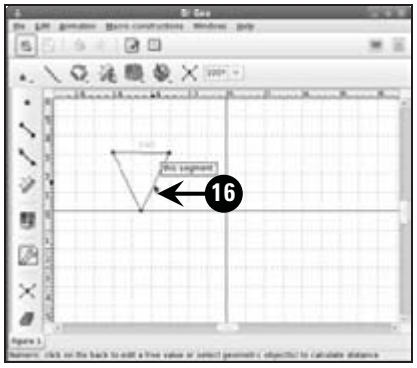


Fig.Linux-8.20

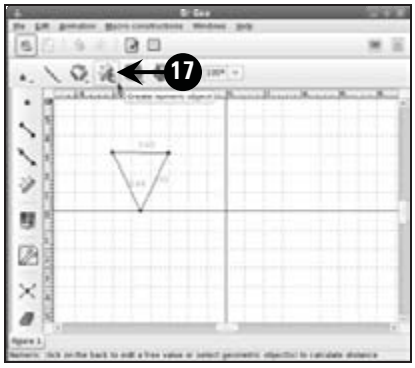


Fig.Linux-8.21

A fly out appears (Fig.Linux-8.22).

18. *Select* the protractor icon to measure the angle defined by three points or two vectors (Fig.Linux-8.22)
19. *Click* the first point (Fig.Linux-8.23).

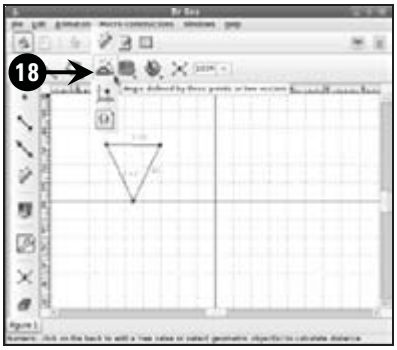


Fig.Linux-8.22

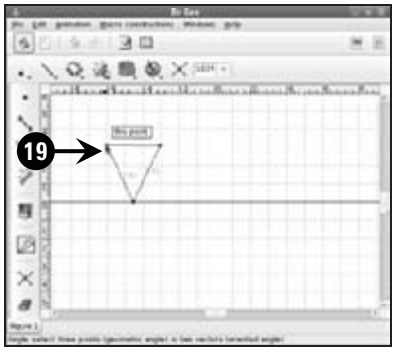


Fig.Linux-8.23

20. *Click* the second point (Fig.Linux-8.24).
21. *Click* the third point (Fig.Linux-8.25).
    The measurement of the angle appears, which is 65 degree in our case (Fig.Linux-8.25).

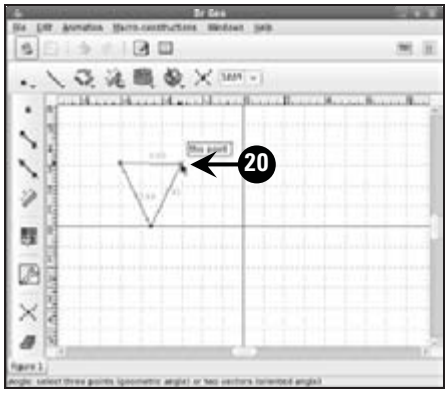


Fig.Linux-8.24

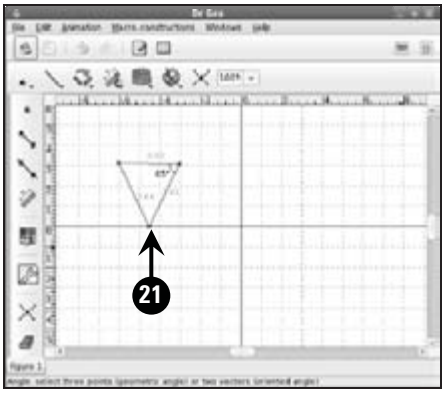


Fig.Linux-8.25

Continue with the following steps to save the figure:

22. *Select* the **File** menu from the Menu bar. A drop-down menu appears (Fig.Linux-8.26).
23. *Select* the **Save** option (Fig.Linux-8.26).
    The **Save as** dialog box appears (Fig.Linux-8.27).
24. *Type* the name of the figure in the text box below the **Selection: /home/kogent** option. In our case, we have typed the name of the figure as **sample** (Fig.Linux-8.27).
25. *Click* the **OK** button (Fig.Linux-8.27).

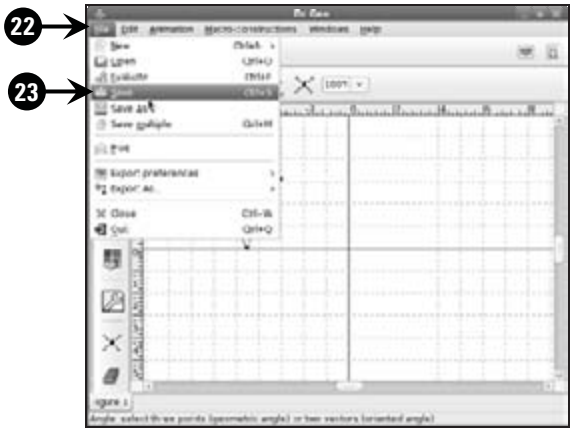


Fig.Linux-8.26



Fig.Linux-8.27

The file is saved.

26. *Select* **File→Quit** to quit the application (Fig.Linux-8.28).
    A confirmation dialog box appears (Fig.Linux-8.29).
27. *Click* the **Yes** button (Fig.Linux-8.29).

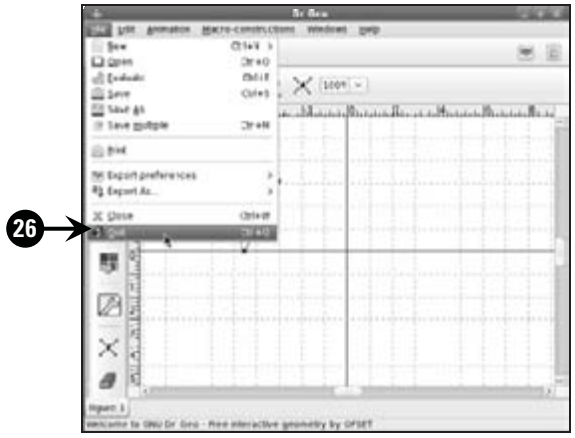


Fig.Linux-8.28

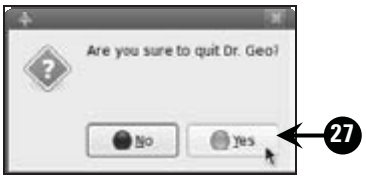


Fig.Linux-8.29

The Dr.Geo application is closed.

Let's now explore the dictionary application.

Introducing Dictionary

A dictionary is a collection of alphabetical words and phrases. A dictionary defines the multiple meaning, pronunciation, synonyms, and antonyms of the words and phrases. Linux provides you Fantasdic dictionary that can be used to determine the meaning of any word that you are not familiar with. The Fantasdic dictionary is free software available in the GNU Network Object Model Environment (GNOME) desktop environment.

Perform the following steps to use the dictionary application:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.30).
2. *Select* the **Accessories** option. A sub menu appears (Fig.Linux-8.30).
3. *Select* the **Fantasdic dictionary** option, as shown in Fig.Linux-8.30:

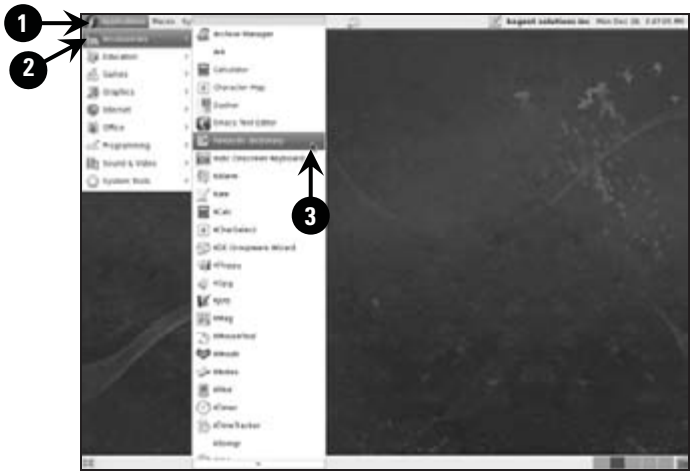


Fig.Linux-8.30

The **Fantasdic** window gets open (Fig.Linux-8.31).

4. *Type* the word whose meaning you want to find in the text box. In our case, we have typed the **archive** word (Fig.Linux-8.31).

5. *Press* the **ENTER** key.
   The meaning of the specified word gets displayed (Fig.Linux-8.32).



Fig.Linux-8.31



Fig.Linux-8.32

6. *Select* the **Fantasdic** menu from the Menu bar. A drop-down menu appears (Fig.Linux-8.33).
7. *Select* the **Quit** option, as shown in Fig.Linux-8.33:



Fig.Linux-8.33

The Fantasdic dictionary gets close.

Let's now learn how to increase the typing speed.

Speeding up with Typing Tutorials

Nowadays, a computer is used by every person, whether for enjoyment or for work purpose. To work efficiently, you should have control over the two most important devices of the computer that are keyboard and mouse. You might require working with word processor applications on a day to day basis. To work on these processors in an efficient manner, you should have good typing speed. It is not like that if you do not have good typing speed you can not use the word processors available with the application. However, you should learn how to type fast without any mistake. Fedora Linux provides you the following typing applications that help you to increase your typing speed:

- GNU
- TUX

Let's learn about these in detail.

Using GNU Typing

The GNU typing tutorial is referred as gtypist. It is a terminal based typing tutorial without any graphics. The gtypist application is also free software and is licensed under GNU General Public License (GPL). This application provides you a typing tutorial in different languages and has multiple interfaces based on the languages. One of the advantages of using this tutorial is you can create new tutorials and modify the existing tutorials according to the requirement. It provides you various writing exercises that increase your typing speed.

Perform the following steps to use the gtypist application:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.34).
2. *Select* the **System Tools** option. A sub menu appears (Fig.Linux-8.34).
3. *Select* the **Terminal** option, as shown in Fig.Linux-8.34:

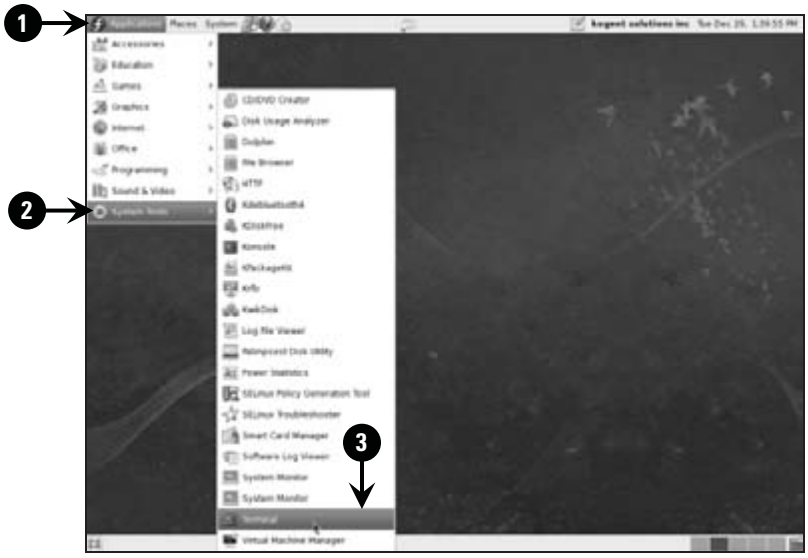


Fig.Linux-8.34

The Terminal window appears (Fig.Linux-8.35).

4. *Type* **gtypist** at the command prompt (Fig.Linux-8.35).
5. *Press* the **ENTER** key.
6. *Select* the lesson series. In our case, we have selected the **Series Q** lesson series (Fig.Linux-8.36).

A screen displaying the list of lesson series appears (Fig.Linux-8.36).

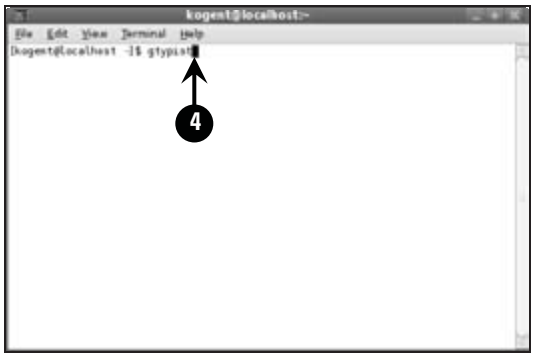


Fig.Linux-8.35

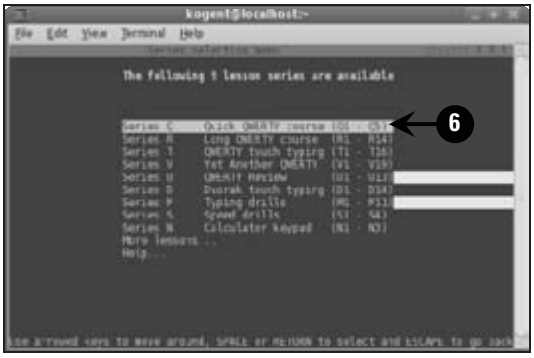


Fig.Linux-8.36

7. *Press* the **ENTER** key.
   A screen displaying the list of lessons present in the series appears (Fig.Linux-8.37).
8. *Press* the **ENTER** key.
   The Lesson Q1 tutorial screen appears (Fig.Linux-8.38).



Fig.Linux-8.37



Fig.Linux-8.38

9. *Press* the **ENTER** key.
   A new screen of the Lesson Q1 tutorial screen appears (Fig.Linux-8.39).
10. *Press* the **ENTER** key.
    The DRILL PATTERNS page of the Lesson Q1 tutorial screen appears (Fig.Linux-8.40).



Fig.Linux-8.39



Fig.Linux-8.40

11. *Press* the **ENTER** key.
    A screen displaying a practice exercise appears (Fig.Linux-8.41).
12. *Type* the content that is given for practice (Fig.Linux-8.42).

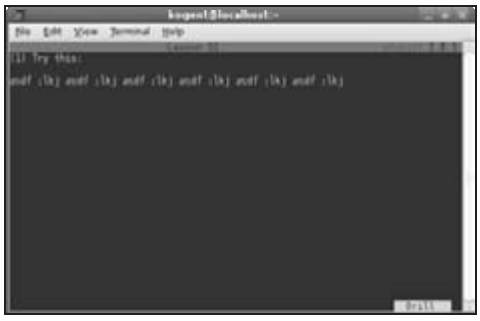


Fig.Linux-8.41

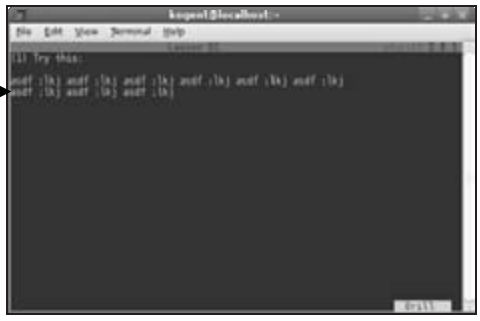


Fig.Linux-8.42

13. *Press* the **ENTER** key.

    Some instructions, such as raw speed, adjusted speed, and the error percentage, appears on the screen (Fig.Linux-8.43).

14. *Press* the **E** key to exit the exercise.

    A confirmation message appears that asks you whether you want to exit the current lesson or not (Fig.Linux-8.44).



Fig.Linux-8.43



Fig.Linux-8.44



You can also press the R key to repeat the exercise or the N key for the next exercise.

15. *Press* the **Y** key to quit the lesson.



Press the N key if you want to continue the lesson and do not want to quit.

    A screen displaying the list of lessons present in the Q series appears again (Fig.Linux-8.37).

16. *Press* the **ESC** key to quit the lesson.

    A screen displaying the list lessons series appears (Fig.Linux-8.36).

17. *Press* the **ESC** key to quit the lessons series.

    A Terminal window reappears and displays the message, **Happy Typing** (Fig.Linux-8.45).

18. *Select* the **File** menu from the menubar (Fig.Linux-8.46).

19. *Select* the **Close Window** option to close the Terminal window (Fig.Linux-8.46).



Fig.Linux-8.45



Fig.Linux-8.46



If the confirmation dialog box appears, click the OK button.

Let's now learn to use the Tux typing application.

Using Tux Typing

Tux typing is a free typing application provided by Fedora Linux. It is an open source application that is easy to use. This application is created especially for children. The Tux typing application is fun based typing application that helps kids who want to learn typing. It consists of various games, such as Fish Cascade, Comet Zap, and Lessons.

Perform the following steps to use the Tux typing application:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.47).
2. *Select* the **Games** option. A sub menu appears (Fig.Linux-8.47).
3. *Select* the **Tux Typing** option from the sub menu, as shown in Fig.Linux-8.47:

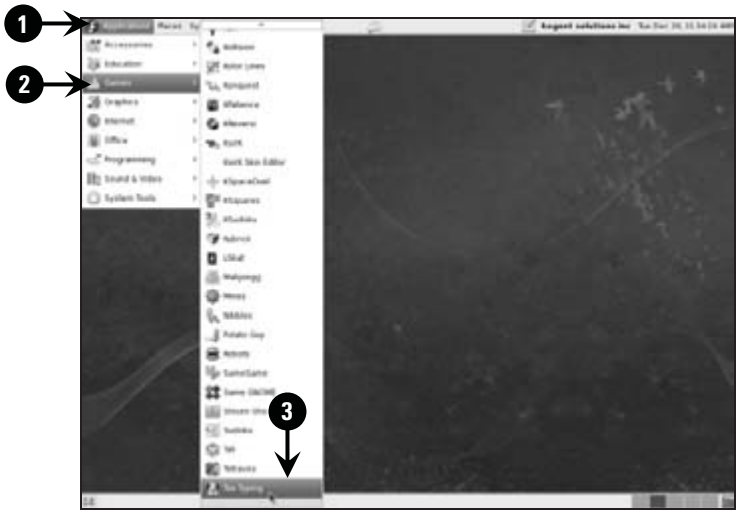


Fig.Linux-8.47

The **Tux Typing** application gets open (Fig.Linux-8.48).

4. *Select* the **Lessons** option (Fig.Linux-8.48).
   A window displaying the list of lessons appears (Fig.Linux-8.49).
5. *Select* the **basic_lesson_01.xml** option (Fig.Linux-8.49).



Fig.Linux-8.48



Fig.Linux-8.49

A window displaying instructions about the lesson appears (Fig.Linux-8.50).

6. *Press* the SPACEBAR key.
   A new window with some more instructions appears (Fig.Linux-8.51).



Fig.Linux-8.50

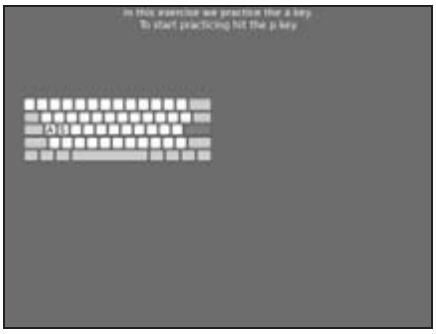


Fig.Linux-8.51

7. *Press* the **P** key to start the practice.
   A window displaying the content of the lesson appears (Fig.Linux-8.52).
8. *Type* the content given for practice (Fig.Linux-8.52).
   When you have finished typing, a window appears with the new content (Fig.Linux-8.53).



Fig.Linux-8.52



Fig.Linux-8.53

If at any time, you want to quit the application, *press* the **Esc** key. A window displaying the **Great Job** message appears (Fig.Linux-8.54).

9. *Press* the SPACEBAR key.
   The main menu window appears (Fig.Linux-8.55).
10. *Select* the **Quit** option (Fig.Linux-8.55).



Fig.Linux-8.54



Fig.Linux-8.55

The application gets close.

Let's now learn about the OpenGL Globe Earth Simulator.

Introducing OpenGL Globe-Earth Simulation for Linux

The GNOME desktop environment provides you the **GL Globe Simulator** application to determine the latitude and longitude of some specific place on a globe. The animated globe image appears when the GL Globe Simulator application starts along with the current date and time, longitude, and latitude.

Perform the following steps to start the GL Globe Simulator:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.56).
2. *Select* the **Education** option. A sub menu appears (Fig.Linux-8.56).
3. *Select* the **GL Globe Simulator** option, as shown in Fig.Linux-8.56:

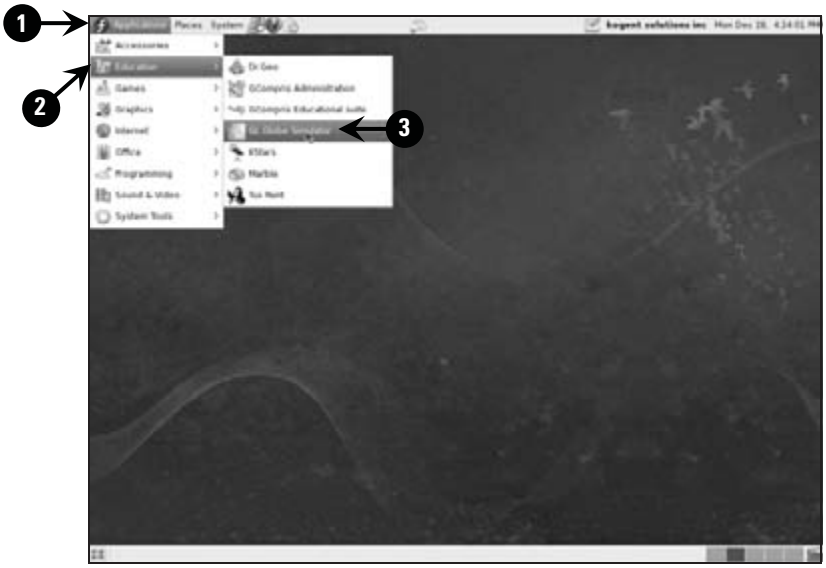


Fig.Linux-8.56

The GL Globe Simulator application opens, as shown in Fig.Linux-8.57:

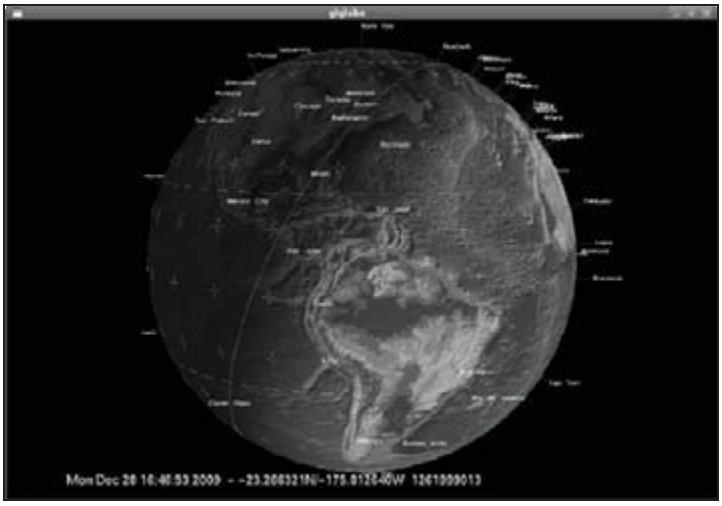


Fig.Linux-8.57

Let's now explore the desktop planetarium application.

Introducing Desktop Planetarium

Linux provides you the KStar desktop planetarium application that comes with K Desktop Environment (KDE). Using this application, you can explore the night sky with accurate graphical simulation. The interface of this application provides various tools that help you explore the night sky easily. It also provides a tool named Solar System Viewer that shows the configuration of the major planets.

Perform the following steps to open KStars:

1. *Select* the **Applications** menu. A drop-down menu appears (Fig.Linux-8.58).
2. *Select* the **Education** option. A sub menu appears (Fig.Linux-8.58).
3. *Select* the **KStars** option, as shown in Fig.Linux-8.58:

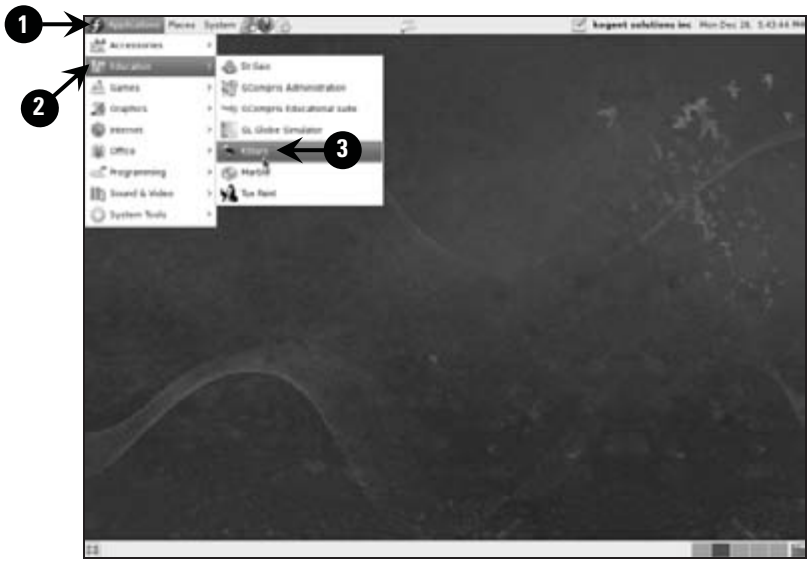


Fig.Linux-8.58

The **KStars** application gets open. By default, **Tip of the Day- KStars** dialog box appears on the application window (Fig.Linux-8.59).

4. *Click* the **Close** button to close the **Tip of the Day- KStars** dialog box (Fig.Linux-8.59).

The **Tip of the Day- KStars** dialog box gets close and the KStars window appears (Fig.Linux-8.60).

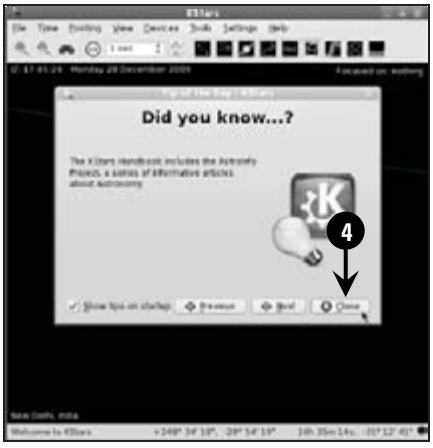


Fig.Linux-8.59

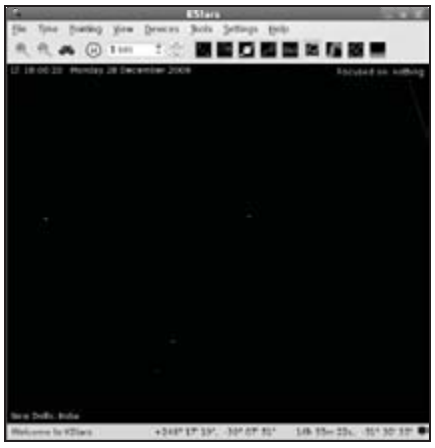


Fig.Linux-8.60

The KStars interface comprises the following components:

- **Titlbar:** Displays the name of the application
- **Menubar:** Consists of different menus, such as File, Time, Pointing, View, Devices, Tools, Settings, and Help
- **Toolbar:** Consists of icons, such as Zoom in, Zoom out, Find, Stop, and various toggling icons (for example, Toggle stars, Toggle deep sky objects, and Toggle Solar system objects)
- **Display Area:** Displays the different universal objects, such as stars, comets, and galaxies
- **Statusbar:** Displays the status of the stars, such as their latitude and longitude

Let's now quickly recap what we have discussed in the previous sections by summarizing the chapter.

Summary

In this chapter, you have learned about different Linux utilities. You have explored suite of educational tools that includes educational suite for 2-10 years old kids and an interactive educational geometry tool. You also get acquainted with dictionary provided with the GNOME desktop environment of Fedora Linux. Further, you have learned how to increase the typing speed by using typing tutorials, such as GNU and Tux. In the end, you have learned about the OpenGL Globe-Earth Simulation and desktop planetarium.

CHAPTER

9

Working with Users and User Accounts

In this Chapter:

- Managing User Accounts
- Managing Groups

A person who has access to a system is known as a user of the system. Anyone who wants to access a system should have a user account's name and password on the system. This, however, does not mean that a system must have ten user accounts if ten users are using the system. There may be three accounts only, such as administrator, group 1 and group 2. Each of the ten users, depending on the type of access he or she has, can be given a user name and password of one of these three accounts. Each user account has a unique user name and password, assigned by the administrator. Any user trying to log into a particular user account must enter the correct user name and password for that account.

In this chapter, you learn to manage user accounts, which include adding a user account, displaying a user account, deleting a user account, and changing the properties of a user account. The chapter also shows you how to manage groups, including creating a group and adding user accounts to a group. Toward the end of the chapter, you learn to set the file permissions for a group.

Let's begin by discussing how to manage user accounts and groups.

Managing User Accounts

In Linux, one of the main responsibilities of a system administrator is to manage user accounts and groups. A group is a collection of user accounts that are related to each other, such as a group of users in the Human Resource department. Managing user accounts includes tasks such as adding, modifying, and deleting user accounts. Managing groups include tasks, such as creating a new group, adding user accounts to a group, and setting file permissions for groups. Fedora 11 provides you the User Manager utility to manage all activities regarding user accounts and groups.

Let's now learn to add a user account.

Adding User Accounts

You must have a user account on your system to use Linux. By default, the root (also known as superuser) account is created during the installation of Linux, which provides you all the administrative privileges, such as adding user account and creating groups, on your system. You can protect your files and directories by restricting the password on your account.

Perform the following steps to add a user account in Linux:

1. *Click* the **System** menu on panel menubar of the GNU Network Object Model Environment (GNOME) desktop (Fig.Linux-9.1). A drop-down menu appears (Fig.Linux-9.1).
2. *Place* the mouse pointer on the **Administration** option in the drop-down menu (Fig.Linux-9.1). A submenu appears (Fig.Linux-9.1).
3. *Select* the **Users and Groups** option from the submenu, as shown in Fig.Linux-9.1:

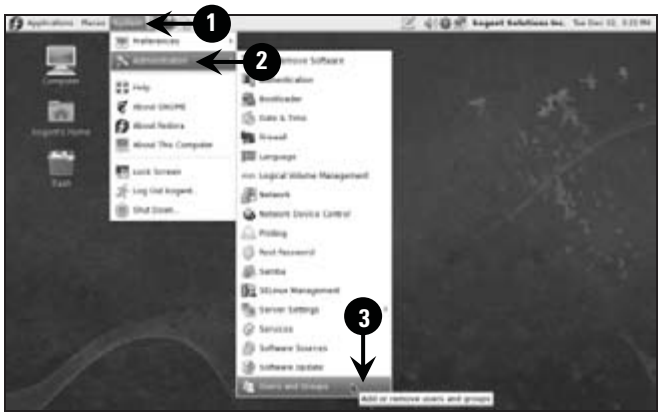


Fig.Linux-9.1

The **Query** dialog box appears (Fig.Linux-9.2), in which you have to enter the root password to grant administrative privileges for users.

4. *Type* the root password in the **Password** text box (Fig.Linux-9.2).
5. *Click* the **OK** button (Fig.Linux-9.2).

   As soon as you click the OK button in the Query dialog box, the **User Manager** window appears. This window displays the user account that was created at the time of installing Fedora 11 (Fig.Linux-9.3).

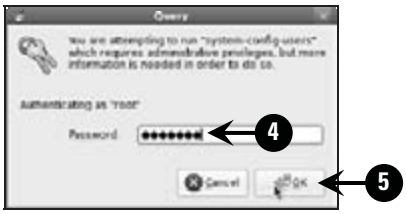


Fig.Linux-9.2



Fig.Linux-9.3

User accounts are arranged in alphabetical order in the User Manager window. For each user account, the User Manager window displays the following columns: User Name, User ID, Primary Group, Full Name, Login Shell, and Home Directory. The following is a brief description of these columns:

- **Users:** Displays the name of the user as entered while creating the user account.
- **User ID:** Refers to the unique identification number (known as User ID or UID) of an account assigned to a user by the Linux operating system at the time of the creation of the account. The system uses the unique number to identify the user when he or she logs in to the system, and determines the level of access to be allowed to the user.
- **Primary Group:** Refers to a group category to which a user account may belong. A group is used to organize some related accounts.
- **Full name:** Displays the full name of the user as entered when creating the account.
- **Login Shell:** Refers to shell, which is a program that allows the user to log in and then interact with the operating system.
- **Home Directory:** Refers to the top-level directory for a user. It contains all the subdirectories and files of a particular user account. The name of the home directory is displayed as an icon in the desktop and is preceded by the user name. For example, the name of the home directory for the user name kogent would be kogent's Home.

6. *Click* the **Add User** button from the Toolbar (Fig.Linux-9.4).

   The **Create New User** dialog box appears (Fig.Linux-9.5).



Fig.Linux-9.4



Fig.Linux-9.5

You can enter the details about the new user account in this dialog box.

7. *Type* a user name in the **User Name** text box (Fig.Linux-9.6). In our case, we have typed **Nisha**.



As soon as you move to the next text box after typing the user name, path of the home directory appears in the Home Directory text box in case the Create home directory check box is selected. This check box is selected by default, and shows the name of the home directory that would be created for the new user account. The name of the home directory is the same as the user name.

8. *Type* the full name of the user in the **Full Name** text box (Fig.Linux-9.6).
9. *Type* the password in the **Password** text box. The characters you type in this text box appear as asterisks (*) so that others are not able to read your password (Fig.Linux-9.6).
10. *Type* the same password again in the **Confirm Password** text box (Fig.Linux-9.6).
11. *Select* the **Create a private group for the user** check box to create a private group for this user account. If you do not select this check box then the user account is automatically assign the primary group (Fig.Linux-9.6).
12. *Select* the **Specify user ID manually** and **Specify group ID manually** check boxes to manually enter the user and group IDs. In our case, we are using the default user IDs (Fig.Linux-9.6).
13. *Click* the **OK** button, as shown in Fig.Linux-9.6:

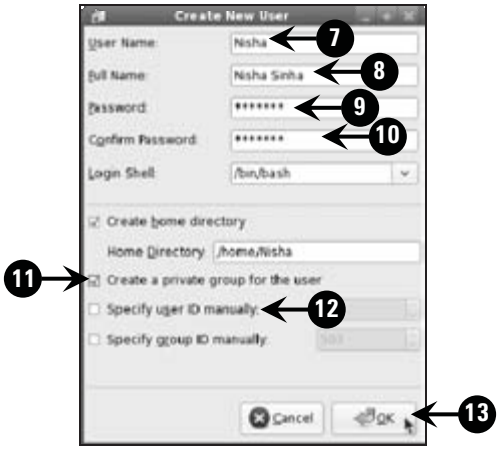


Fig.Linux-9.6

You can view the created user in the User Manager window (Fig.Linux-9.7).

14. Repeat the steps 6 to 13 to add more users, if required. In our case, we have added one more user, **Kapoor** (Fig.Linux-9.8).



Fig.Linux-9.7



Fig.Linux-9.8

After learning how to create user accounts, let's now learn to display a user account by using the User Manager utility.

Displaying User Accounts

The main user account that is created during the installation of Linux is called root. This user account is used by the administrator, who has all permissions for all files on the system. A user who logs in as the root user can modify any file on the system. During the installation of Linux, the installer prompts you to create other accounts besides the root account. If you enter the details for additional accounts, they are included in the list of user accounts. The names of all the users are displayed by the User Manager window. In our case, the User Manger window displays the three user accounts: kogent, Nisha, and Kapoor (Fig.Linux-9.8).

You can view the User Manager window if it is closed by selecting **System→Administration→Users and Groups** from panel menubar.

Let's now learn to change the properties of user accounts.

Changing the User Account Properties

We can also change the properties of a user account after creating it. For example, if you do not remember the password you entered when creating a user account, you can easily change the password by using the User Properties dialog box. However, you must know the root password to change the properties of any user account.

Perform the following steps to change the properties of a user account:

1. *Select* the user whose account properties you want to change (Fig.Linux-9.9). In our case, we have selected **Nisha** as the user.
2. *Click* the **Properties** button from the Toolbar (Fig.Linux-9.9).

   The User Properties dialog box appears (Fig.Linux-9.10).
3. *Double-click* in the **Password** text box. The asterisks in this box are highlighted (Fig.Linux-9.10).



Fig.Linux-9.9



Fig.Linux-9.10

4. *Type* a new password in the Password text box (Fig.Linux-9.11).
5. *Type* the same password in the **Confirm Password** text box for password confirmation (Fig.Linux-9.11).
6. *Click* the **OK** button (Fig.Linux-9.11).

   The account properties are now changed and User Properties dialog box closes. You return to the User Manager window again (Fig.Linux-9.12).



Fig.Linux-9.11



Fig.Linux-9.12

Next, let's learn to delete a user account.

Deleting User Accounts

In Linux, you may want to delete a user account if a user of your computer no longer needs access to it. You can do this by using the Delete button from the User Manager window.

Perform the following steps to delete a user account that is no longer in use:

1. *Select* the user that you want to delete (Fig.Linux-9.13). In our case, we have selected **Kapoor**.
2. *Click* the **Delete** button on the Toolbar, as shown in Fig.Linux-9.13:



Fig.Linux-9.13

A message box appears, asking you to confirm the deletion.

3. *Click* the **Yes** button to delete the selected user, as shown in Fig.Linux-9.14:



Fig.Linux-9.14

As soon as you click the Yes button on the message box, the user is removed from the User Manager window, as shown in Fig.Linux-9.15:



Fig.Linux-9.15

Let's now learn to manage groups.

Managing Groups

A group is a collection of related user accounts. For example, a group called wages may contain the user accounts of all the users who are on daily wages in a company. When a new user account is created, Linux automatically assigns to it a group, which has the same name as that of the user account. This means that each user account belongs to a group, and that group may have one or more user accounts. This automatically assigned group is known as the primary group of the account. However, you can create more groups and include different user accounts in them.

Let's now learn to create a new group.

Creating New Groups

You can create new groups according to your requirements. Linux automatically assigns a group ID to every new group. However, you can also apply an ID to a group manually when creating the group. Let's first learn to create a user group.

Perform the following steps to create a group:

1. *Select* the **Groups** tab from the **User Manager** window (Fig.Linux-9.16).

   The details of groups are displayed on the User Manager window (Fig.Linux-9.17).
2. *Click* the **Add Group** button from the Toolbar (Fig.Linux-9.17).



Fig.Linux-9.16



Fig.Linux-9.17

   The **Create New Group** dialog box appears (Fig.Linux-9.18).
3. *Type* the name of the group in the **Group Name** text box. In our case, we have typed **Sales** as the group's name (Fig.Linux-9.19).
4. *Select* the **Specify group ID manually** check box to manually enter the group ID. In our case, we go with the default value, that is, **504** (Fig.Linux-9.19).

5. *Click* the **OK** button (Fig.Linux-9.19).



Fig.Linux-9.18



Fig.Linux-9.19

The created group appears in the User Manager window, as shown in Fig.Linux-9.20:



Fig.Linux-9.20

Now that you know how to create groups, let's move ahead and learn to add user accounts in them, as discussed in the following section.

Adding User Accounts to Groups

You can add user accounts to a group after creating the group. A user account must belong to at least one group, whereas a group may not necessarily contain any user account.

Perform the following steps to add a user account to a user group:

1. *Select* the **Users** tab in the User Manager window, as shown in Fig.Linux-9.21:
   The details of user accounts are displayed on the User Manager window (Fig.Linux-9.22).
2. *Select* a user that you want to add to a group. In our case, we have selected **Nisha** (Fig.Linux-9.22).
3. *Click* the **Properties** button from the Toolbar (Fig.Linux-9.22).



Fig.Linux-9.21

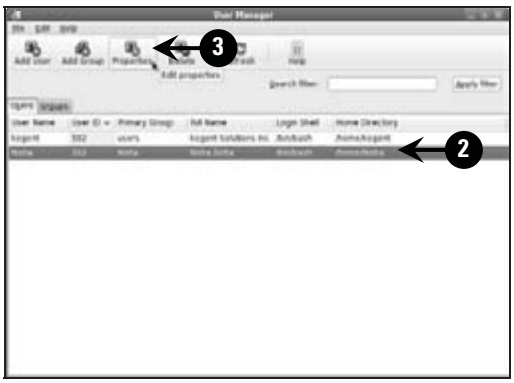


Fig.Linux-9.22

The **Users Properties** dialog box appears (Fig.Linux-9.23).

4. *Select* the **Groups** tab (Fig.Linux-9.23).

   The **User Properties** dialog box appears, displaying a list of groups (Fig.Linux-9.24).

5. *Select* the group in which you want to add the user. In our case, we have selected the **Sales** group (Fig.Linux-9.24).

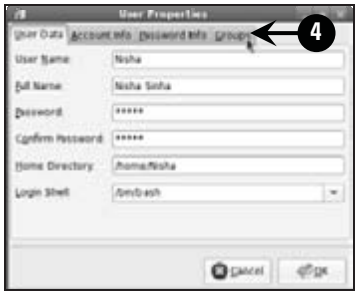


Fig.Linux-9.23

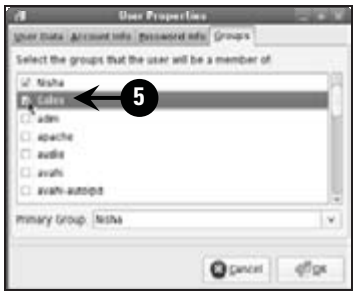


Fig.Linux-9.24

6. *Click* the **OK** button (Fig.Linux-9.25).

   The **User Properties** dialog box closes and you return back to the **User Manager** window (Fig.Linux-9.26).

7. *Select* the **Groups** tab to display groups details page (Fig.Linux-9.26).



Fig.Linux-9.25



Fig.Linux-9.26

As you can see in Fig.Linux-9.26, Nisha is now a member of the Sales group.

8. *Click* the **Close** button from the Title bar of the User Manager window to close the window (Fig.Linux-9.26).

In the preceding section, you have learned to add user accounts to a group. Let's now learn to set file permissions for groups.

Setting File Permissions for Groups

A file on a Linux system is not accessible to all the users of the system. The user who creates a file is known as the owner of the file. The owner of the file has full permissions to access and modify the file. The owner (or the root user) can set different types of permissions for a file, such as read only, and read and write. If the permission for a file is set as read only for a specific group, then the users of that group cannot make any changes in the file. However, if the permission for a file is set as read and write for a group, then the users of that group can make changes to the file. Let's now learn how to view the permissions for a file for different types of users and also modify the permissions by using Nautilus File Manager.

Please refer to Chapter 4 to learn about Nautilus File Manager in detail.

Perform the following steps to view the permissions of a file in Linux:

1. *Double-click* the home directory icon in the GNOME desktop. In our case, this is **kogent's Home**, as shown in Fig.Linux-9.27:



Fig.Linux-9.27

   The kogent's Home directory opens in the Nautilus File Manager window (Fig.Linux-9.28).

2. *Double-click* the name of the folder containing the file whose permissions you want to view. In our case, it is the **HTML files** folder (Fig.Linux-9.28).

   The content of the selected folder (**HTML files**) open in the Nautilus File Manager window now displays (Fig.Linux-9.29).

3. *Right-click* the **HTMLdoc2.html** file. A context menu appears (Fig.Linux-9.29).

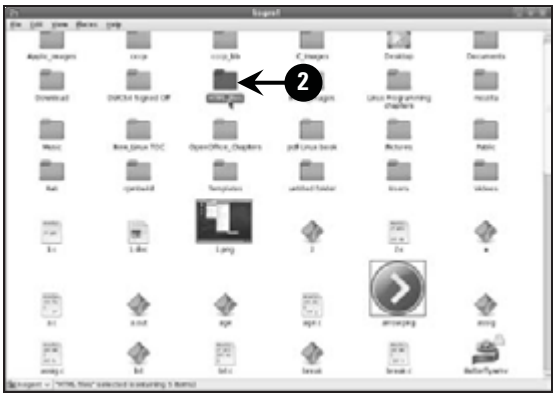


Fig.Linux-9.28

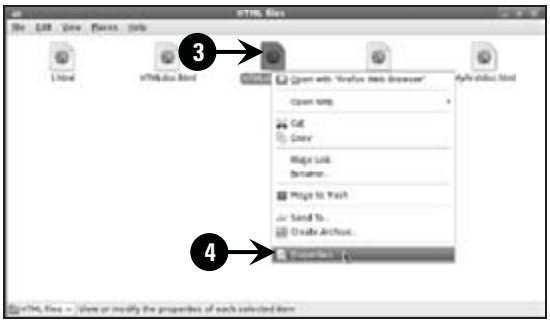


Fig.Linux-9.29

4. *Select* the **Properties** option from the context menu (Fig.Linux-9.29). The **HTMLdoc2.html Properties** dialog box appears (Fig.Linux-9.30).

5. *Select* the **Permissions** tab from the **HTMLdoc2.html Properties** dialog box (Fig.Linux-9.30).

   The Permissions tab displays information about three different permissions assigned to the three types of users for the selected file (Fig.Linux-9.31): Owner (the user who created this file), Group (the group of users to which the file belongs), and Others (all other users of the system).

6. *Select* a group name from the **Group** list box (Fig.Linux-9.31). In our case, we have selected **users** (Fig.Linux-9.31).
7. *Click* the down arrow from the Access list box to select a permission (Fig.Linux-9.31).



Fig.Linux-9.30



Fig.Linux-9.31

A drop-down list appears (Fig.Linux-9.32).

8. *Select* a permission level from the drop-down list. In our case, we have selected **Read and write** (Fig.Linux-9.32).
9. *Click* the down arrow in the **Access** list box under the **Others** category (Fig.Linux-9.33).



Fig.Linux-9.32



Fig.Linux-9.33

A drop-down list appears (Fig.Linux-9.34).

10. *Select* a permission level from the drop-down list. In our case, we have selected **Read and write**, as shown in Fig.Linux-9.34:



Fig.Linux-9.34

You can select the Allow executing file as program check box under the Execute category to run the selected file as a program (Fig.Linux-9.34).

11. *Click* the **Close** button of the **HTMLdoc2.html Properties** dialog box to close the dialog box (Fig.Linux-9.35).
12. *Click* the **Close** button on the Title bar of the **HTML files** window (Fig.Linux-9.36).

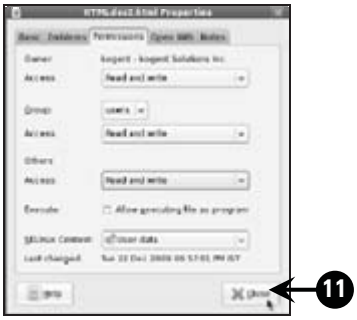


Fig.Linux-9.35

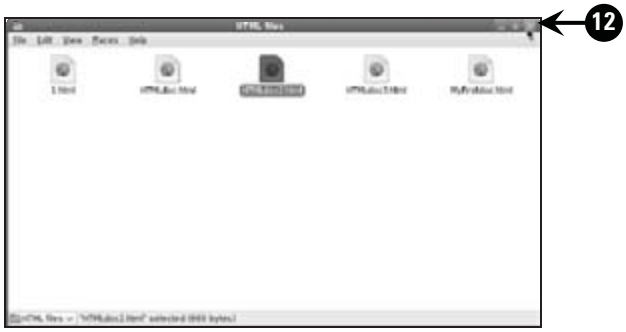


Fig.Linux-9.36

13. *Click* the **Close** button on the Title bar of the Nautilus File Manager window (for **kogent**), as shown in Fig.Linux-9.37:

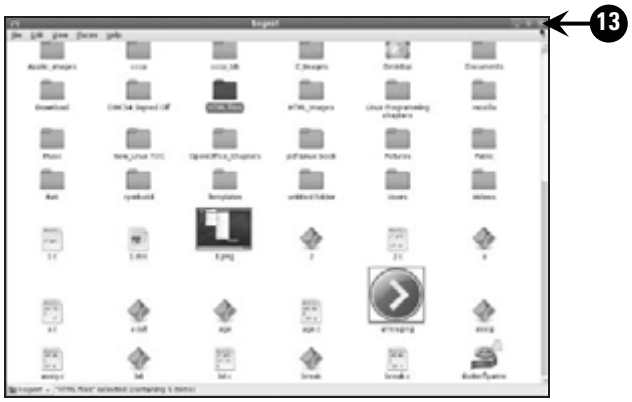


Fig.Linux-9.37

With this, we come to the end of this chapter. Before proceeding to the next chapter, let's summarize the main points of the chapter.

Summary

The chapter has discussed the management of user accounts in Linux in detail. You have learned to add a user account, display a user account, change the properties of a user account, and delete a user account. The chapter has also discussed the use of user groups, where you learned to create user groups as well as add user accounts to a group. In the end of the chapter, you have learned to set the file permissions for a group.

DRAW

CHAPTER

1

Creating and Modifying Objects Using Draw

In this Chapter:

- Opening OpenOffice.org Draw
- Working with Objects
- Working with Slides
- Saving the Draw Document
- Modifying Objects
- Working on a Group
- Quitting the Application

The OpenOffice.org Draw application is a part of the OpenOffice.org suite developed by Sun Microsystems. It is a drawing program that enables you to create and modify different types of graphics formats, such as GIF, PNG, and JPEG. OpenOffice.org Draw provides the facility to use these graphics in other applications. There are two types of graphic programs—Bitmap-based graphics programs and Vector-based graphic programs. In a bitmap-based graphic program, images are manipulated on pixel basis. Therefore, such programs are more useful while working with photographic images. On the other hand, in a vector-based graphic program, a figure is defined as a combination of lines. Hence, a vector-based graphic program is more useful for working with diagrams and logos. OpenOffice.org Draw is a vector-based program that helps you to create meaningful drawings and easily manipulate them. In addition, it allows us to work with bitmaps.

In this chapter, we get familiar with Draw and understand the working of its various tools and features. You learn how to work with objects that includes creating and selecting objects, and changing the outline and fill properties of an object. In addition, you learn to work with slides and perform various tasks such as, inserting a new slide, adding text, changing text properties, and switching between slides. Next, you learn to modify an object by rotating and aligning it. In addition, you also learn to work with groups that include creating and moving the group objects, and merging and combining the objects. In the end, you learn to save the changes and quit the OpenOffice.org Draw application.

Let's begin with opening OpenOffice.org Draw.

Opening OpenOffice.org Draw

When you open the Draw application, a blank document appears that lets you create drawings and insert objects.

To open OpenOffice.org Draw, *Select* the **Applications menu→Office→OpenOffice.org Draw** option from the top panel of the GNOME desktop, as shown in Fig.Draw-1.1:



Fig.Draw-1.1

The OpenOffice.org Draw window opens, as shown in Fig.Draw-1.2:

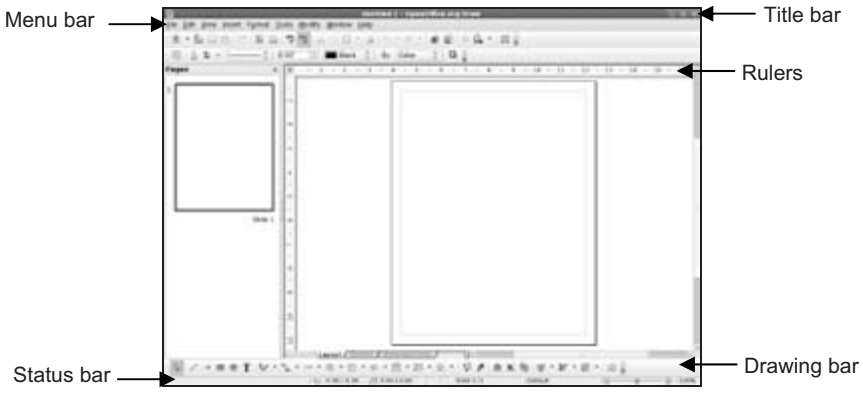


Fig.Draw-1.2



To open an existing file in Draw, select File→Open. The Open dialog box opens. Select the file that you want to open and click the OK button.

The following are the components of the OpenOffice.org Draw window, shown in Fig.Draw-1.2:

- **Titlebar**: Displays the name of the file and application on which you are currently working. It is located at the top of the OpenOffice.org Draw window.
- **Menubar**: Displays various menus, such as file, insert, and view. Each menu is a set of some related commands, for example, the File menu contains commands related to common file functions, such as open, save, and save as.
- **Toolbar**: Contains shortcuts of some of the commonly-used commands, such as cut, copy, and paste. These commands appear in the form of icons in the toolbar.
- **Line and Filling toolbar**: Lets you modify the main properties of a drawing object and icons according to the type of object selected. For example, to change the thickness of a line, click the Line Width list box and select the desired option to achieve the required thickness.
- **Work place**: Refers to a blank area in the central part of the OpenOffice.org Draw window. The Work place is used to draw and place objects.
- **Rulers bar**: Displays the size of a selected object on the page.
- **Drawing toolbar**: Lets you to insert commonly used shapes, such as arrows, circles, rectangle, or lines. It is usually located at the bottom of the OpenOffice.org Draw window.
- **Status bar:** Displays the details of the present status of the current slide. The details include the position of the mouse pointer on the screen, the size of the elected object, the percentage of view of the image, the total number of slides in your document, and number of the current slide.

After exploring the OpenOffice.org Draw window, let's now learn to work with objects in Draw.

Working with Objects

The OpenOffice.org Draw application allows you to insert, create, and work with various types of objects, such as rectangle, square, and polygon in your Drawing. Let's first learn how to create an object in Draw.

Creating an Object

A blank Drawing opens by default whenever you open OpenOffice.org Draw window. You can use this slide to create objects.

Let's perform the following steps to create an object:

1. *Click* the **Basic Shapes** button in the **Drawing toolbar**. A list of shapes options appears, as shown in Fig.Draw-1.3:

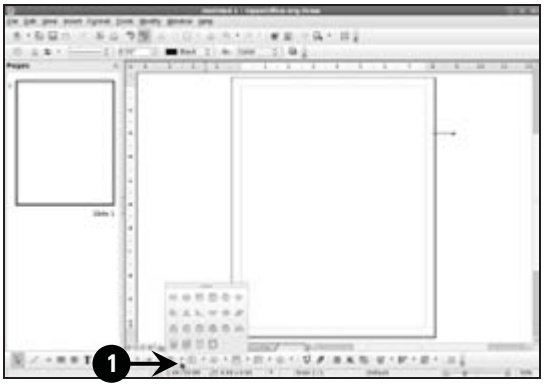


Fig.Draw-1.3

2. *Select* the shape that you want to draw from the list of shapes. In our case, we have selected the **rectangle** shape (Fig.Draw-1.4).
3. *Drag* the mouse-pointer on the Work place to create a rectangle shape, as shown in Fig.Draw-1.4:

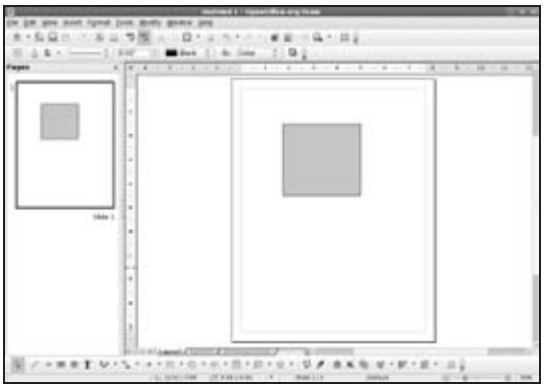


Fig.Draw-1.4

When you draw a figure or place an object in your slide, some default properties are applied to it by default. To change these properties, you need to first select the object.

Selecting an Object

The **Select** tool allows you to select an object in the OpenOffice.org Draw window. Let's perform the following steps to select an object:

1. *Select* the **Select** tool in the **Drawing toolbar** (Fig.Draw-1.5).
2. *Select* the required object from the Work place. In our case, we have selected rectangle object.

   The selected object is indicated by the appearance of eight square-shaped selection handles on its edge and corners, as shown in Fig.Draw-1.5:

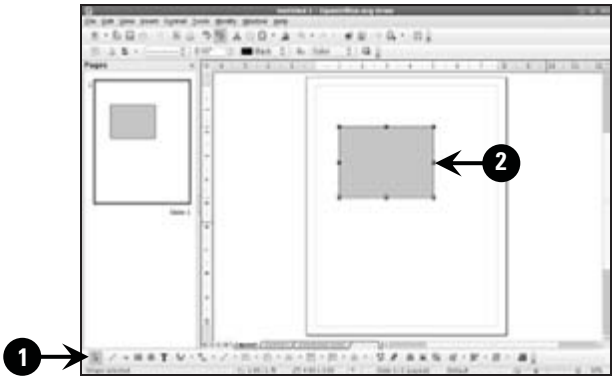


Fig.Draw-1.5

After selecting an object, let's learn how to change its default properties. Let's begin with changing the outline of an object.

Changing the Outline

Draw allows you to change the style, width, and color of the outline of an object. You must ensure that the object should be selected before applying any outline settings.

Let's perform the following steps to change the outline of an object:

1. *Select* the **Rectangle** object from Work place (Fig.Draw-1.6).
2. *Click* the Line Style list box (Fig.Draw-1.6).

   A drop-down list of line styles options appears (Fig.Draw-1.7).

3. *Select* the desired line style from the drop-down list. In our case, we have selected the **Fine dashed (variable)** (Fig.Draw-1.7).

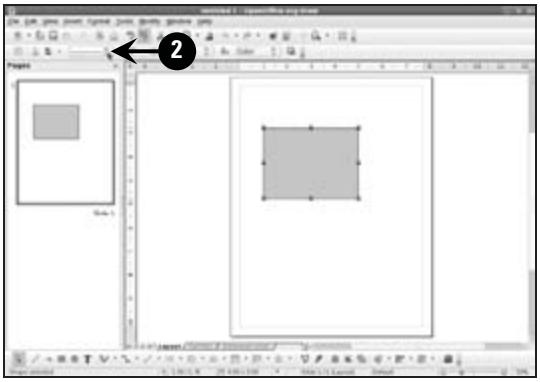


Fig.Draw-1.6

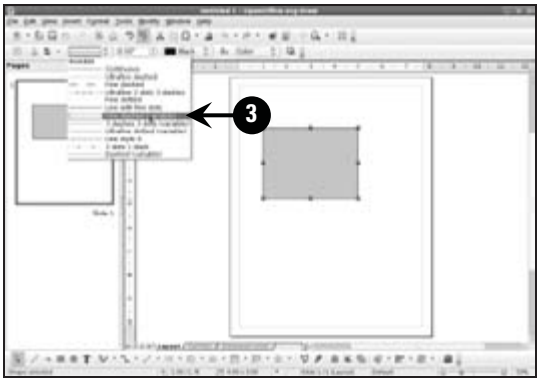


Fig.Draw-1.7

The desired line style is applied on the selected object (Fig.Draw-1.8).

4. *Click* the **Line Width** spin box (Fig.Draw-1.9).

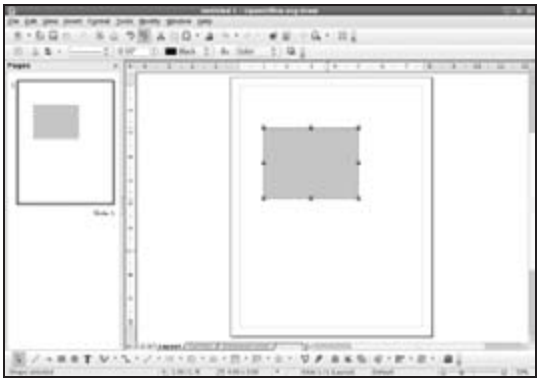


Fig.Draw-1.8

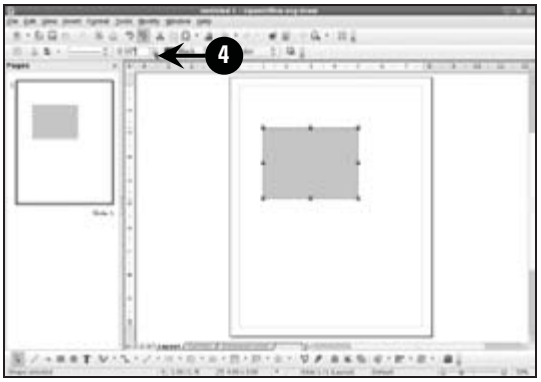


Fig.Draw-1.9

5. *Click* the up arrow button until the value inside the spin box changes to **0.04**. The width of the rectangle object gets changed (Fig.Draw-1.10).
6. *Click* the **Line Color** list box (Fig.Draw-1.11).

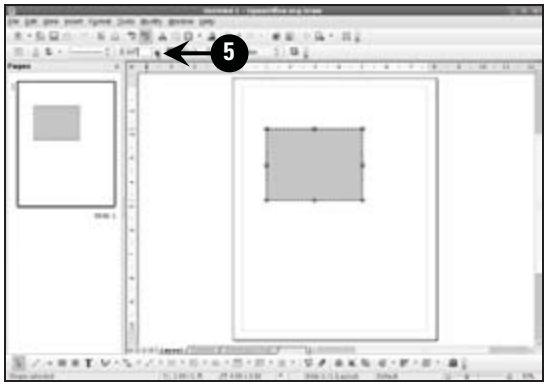


Fig.Draw-1.10

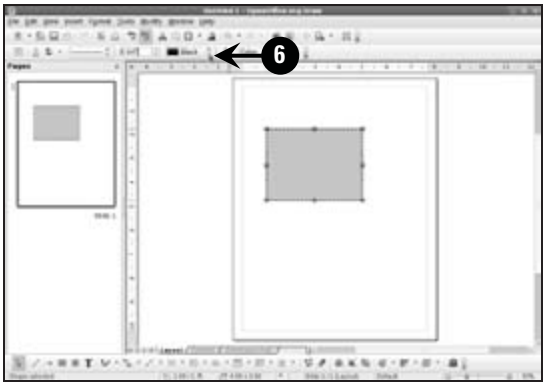


Fig.Draw-1.11

A drop-down list of line colors options appears.

7. *Select* the desired color from the drop-down list. In our case, we have selected the **Red** color (Fig.Draw-1.12).

The selected color is applied to the outline of the rectangle (Fig.Draw-1.13).

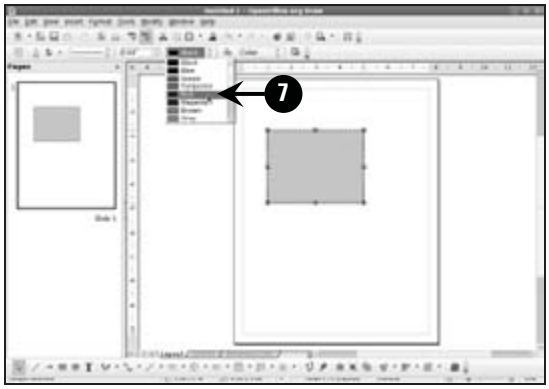


Fig.Draw-1.12

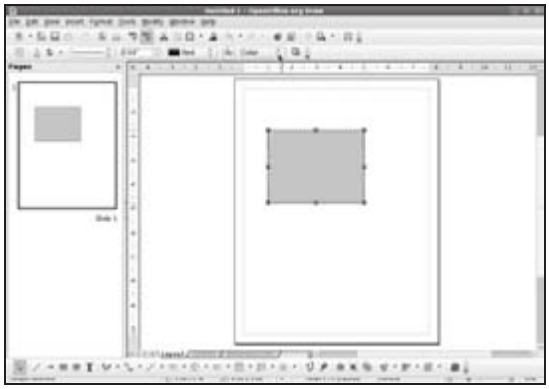


Fig.Draw-1.13

After changing the outline color of the object, let's learn to change the fill properties of the object.

Changing the Fill Properties of an Object

A filled object, by default, appears in blue color. However, you can change the fill properties of an object to fill it with color, texture, or a bitmap image. Let's now learn how to set different fill properties of an object.

Changing the Fill Color

Let's perform the following steps to change the fill color of an object:

1. *Click* the **Area Style/Filling** list box. A drop-down list appears (Fig.Draw-1.14).
2. *Select* the **Color** option from the drop-down list, as shown in Fig.Draw-1.14:

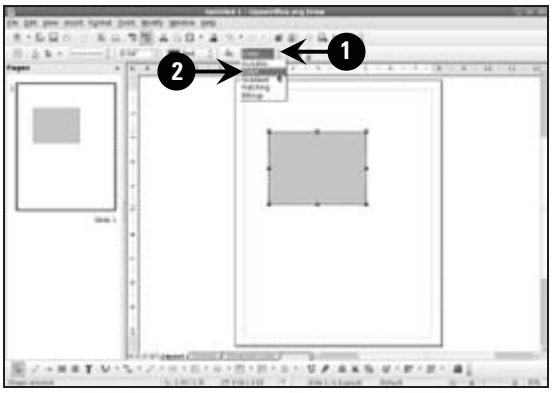


Fig.Draw-1.14

The **Area** dialog box appears (Fig.Draw-1.15).

3. *Select* the desired color from the **Table: standard** color picker in the Colors tab. In our case, we have selected the **Green** color (Fig.Draw-1.15).
4. *Click* the **OK** button (Fig.Draw-1.16).



Fig.Draw-1.15



Fig.Draw-1.16

The selected color is applied to the rectangular object (Fig.Draw-1.17).

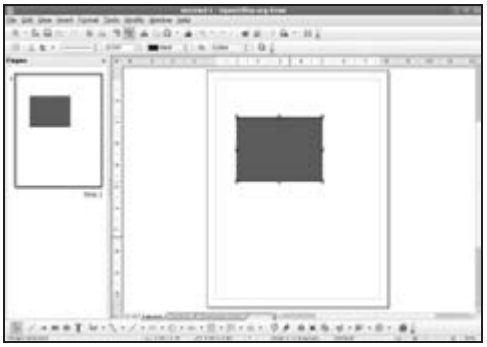


Fig.Draw-1.17

After changing the fill color of the object, let's learn to fill the object with texture.

Filling an Object with Texture

Let's perform the following steps to fill an object with texture:

1. *Click* the **Area Style/Filling** list box. A drop-down list appears (Fig.Draw-1.18).
2. *Select* the **Hatching** option (Fig.Draw-1.18).

   An **Area** dialog box appears displaying various hatching patterns that we can apply to the selected object (Fig.Draw-1.19).
3. *Select* the desired pattern from the Properties pane in the Hatching tab. In our case, we have selected **Red crossed 0 degrees** (Fig.Draw-1.19).
4. *Click* the **OK** button (Fig.Draw-1.19).

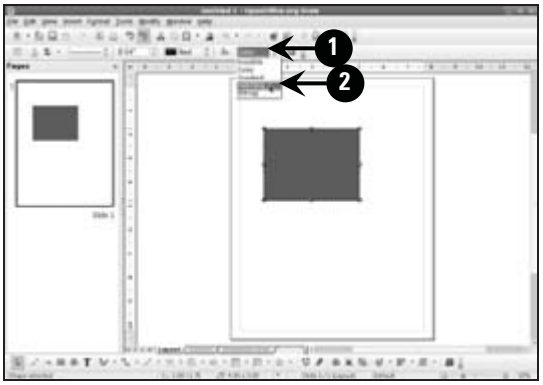


Fig.Draw-1.18

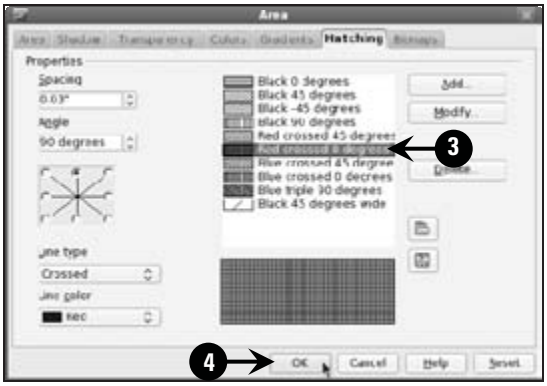


Fig.Draw-1.19

The selected pattern is applied to the rectangle object, as shown in Fig.Draw-1.20:

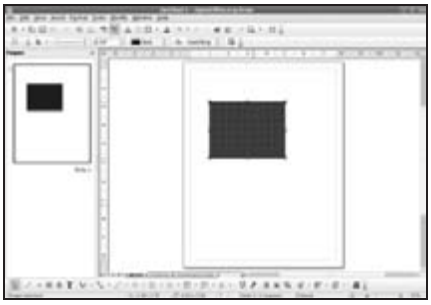


Fig.Draw-1.20

Let's now learn how to fill an object with bitmap.

Filling an Object with Bitmap

Let's perform the following steps to fill an object with bitmap:

1. *Click* the **Area Style/Filling** list box (Fig.Draw-1.21). A drop-down list appears.
2. *Select* the **Bitmap** option (Fig.Draw-1.21).
   The **Area** dialog box appears with the **Bitmaps** tab selected (Fig.Draw-1.22).
3. *Select* the desired option to apply the fill as bitmap. In our case, we have selected the **Stone** option (Fig.Draw-1.22).
4. *Click* the **OK** button to close the **Area** dialog box (Fig.Draw-1.22).

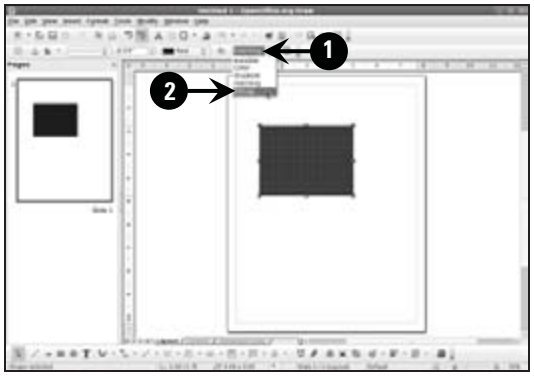


Fig.Draw-1.21

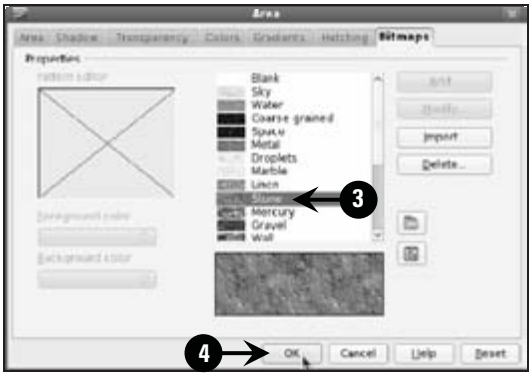


Fig.Draw-1.22

The selected bitmap is applied to the rectangular object, as shown in Fig.Draw-1.23:

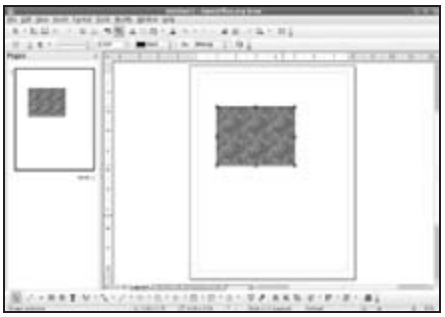


Fig.Draw-1.23



If you want to remove fill from the object then first of select the object and then click the Area Style/Filling list box located on the toolbar. In the drop-down list select the Invisible option. The object will appear without any fill.

After learning about fill property from the object, let's now learn to work with slides and draw shapes and objects on the slide.

Working with Slides

As already discussed, when you open the Draw application, by default, a new blank Drawing inserted along with a slide, named Slide 1, appears in the Slide pane. However, you can insert any number of slides in the document depending upon the requirement. In this section, you learn to work with slides that include inserting a new slide, adding text to a slide, changing text properties, and switching between slides.

Inserting a New Slide

Let's perform the following steps to insert a new slide in the document.

1. *Click* the **Insert** menu in the menubar. A drop-down menu appears (Fig.Draw-1.24).
2. *Select* the **Slide** option from the drop-down menu (Fig.Draw-1.24).

A new slide appears on the Work place (Fig.Draw-1.25).

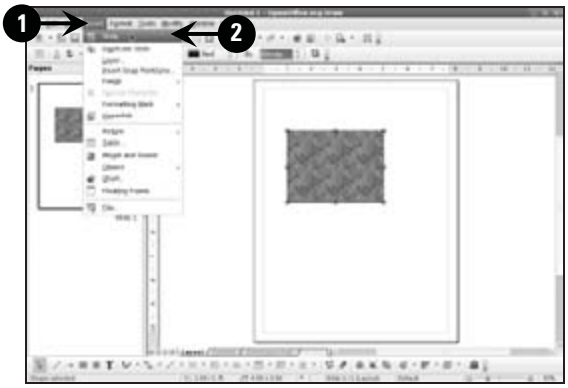


Fig.Draw-1.24

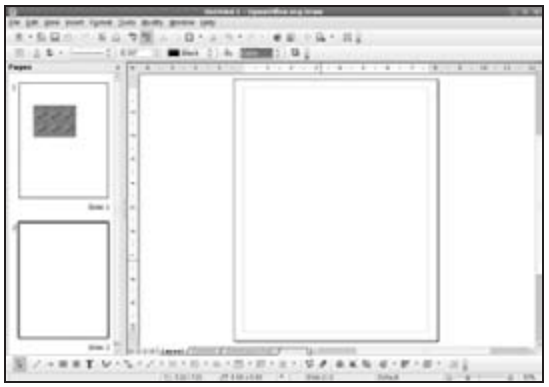


Fig.Draw-1.25

After learning to insert a slide in a document, let's now learn to add text in a slide.

Adding Text in a Slide

OpenOffice.org Draw allows you to add text in a slide as well as on the objects that are added in a slide.

Let's perform the following steps to add text in a slide:

1. *Click* the **Text** tool under the **Drawing toolbar** (Fig.Draw-1.26).
2. *Position* the mouse pointer on that location of the slide from where you want to add the text (Fig.Draw-1.27).

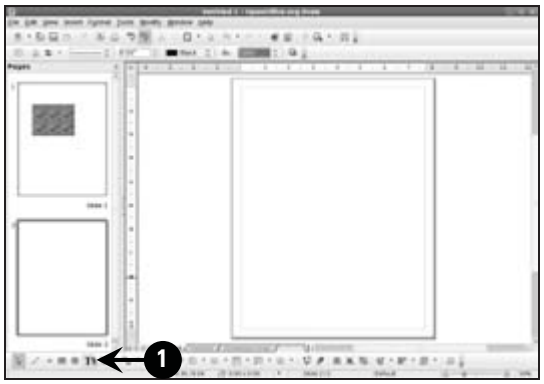


Fig.Draw-1.26

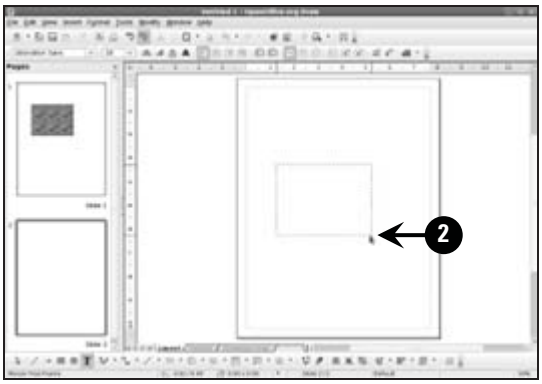


Fig.Draw-1.27

3. *Drag* the mouse-pointer on the Work place to create a text box (Fig.Draw-1.28).
4. *Enter* the text in the text box (Fig.Draw-1.28).

You can click anywhere outside the text box in the Work place to de-select the text box (Fig.Draw-1.29).

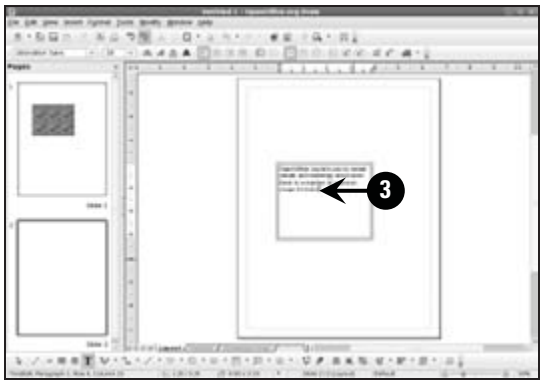


Fig.Draw-1.28

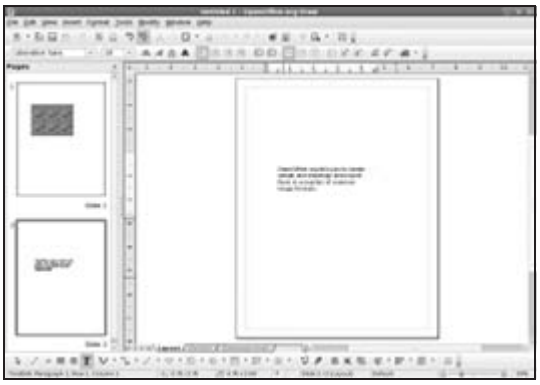


Fig.Draw-1.29

After learning to insert text in a slide, let's now learn to change the text properties.

Changing the Text Properties

When you add text to a document, the default font, size, color, and other text properties are applied to it. You can modify the text in a variety of ways by changing its default properties. Let's now learn how to change the appearance of text by modifying its properties.

Changing the Font

The font is the design that is applied to a character set. The default font that Draw applies to the inserted text is Liberation Sans.

Let's perform the following steps to change the default font to your desired font:

1. *Select* the text to change the font (Fig.Draw-1.30).
2. *Click* the **Font Name** combo box. A drop-down list appears with the list of fonts (Fig.Draw-1.31).

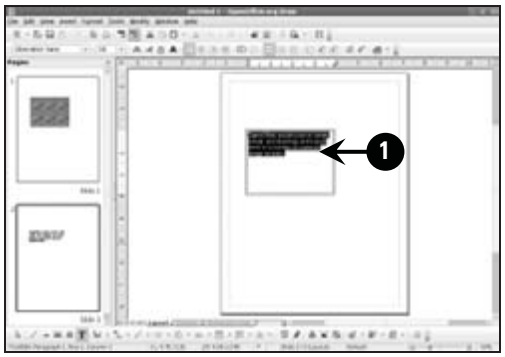


Fig.Draw-1.30

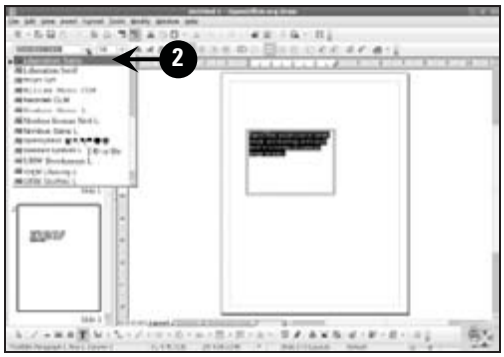


Fig.Draw-1.31

3. *Select* the desired font option from the drop-down list. In our case, we have selected the **URW Chancery L** (Fig.Draw-1.32).

The font is applied to the selected text (Fig.Draw-1.33).

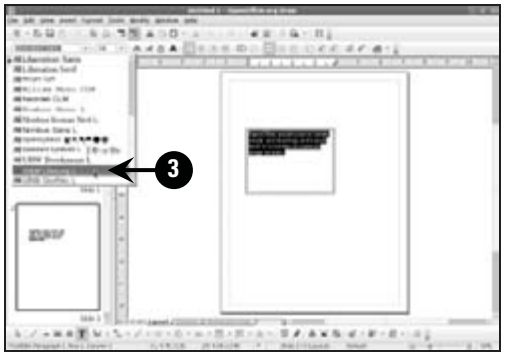


Fig.Draw-1.32



Fig.Draw-1.33

Let's now learn how to change the font size.

Changing the Font Size

The default size in which a text appears in Draw is 18.

Let's perform the following steps to change the font size:

1. *Select* the text of which you want to change the font size (Fig.Draw-1.34).
2. *Click* the **Font Size** combo box. A drop-down list appears, as shown in Fig.Draw-1.34:

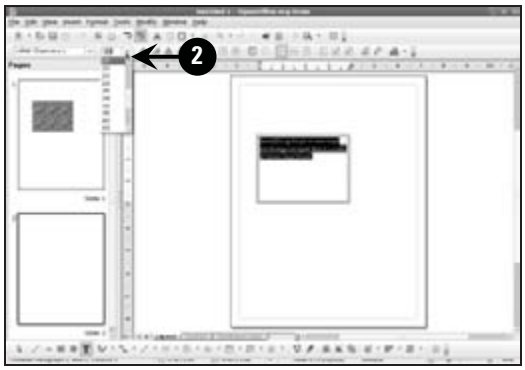


Fig.Draw-1.34

3. *Select* the 40pt size from the drop-down list (Fig.Draw-1.35).

The size of the selected text is increased (Fig.Draw-1.36).

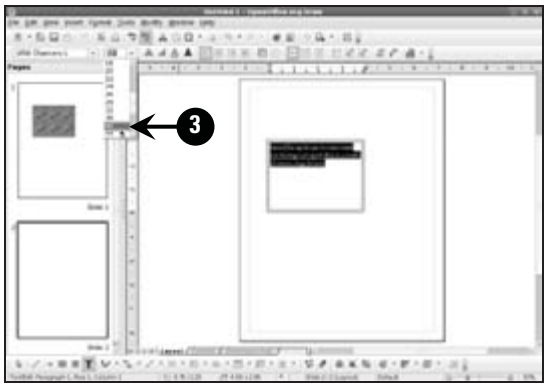


Fig.Draw-1.35

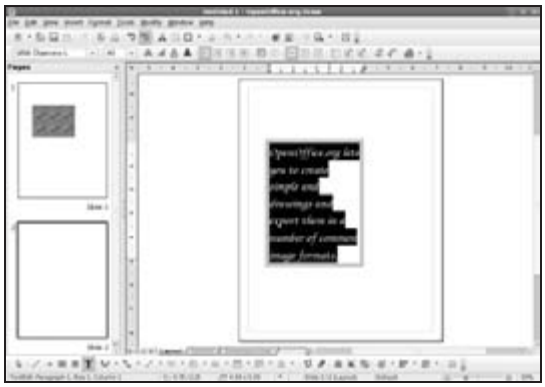


Fig.Draw-1.36

After learning about setting the style and size of the font, let's learn to switch between different slides in a document.

Switching Between Slides

When you insert a new slide in your document, it becomes the currently selected slide now, suppose you want to work in any of the previous slide, say Slide1. For this, you need to open that slide again on the screen. Moving from one slide to another is known as switching between slides.

To switch from one slide to another, *Click* the mouse-pointer in the slide that you want to open in the **Slides pane**. In our case, we clicked on **Slide 1** (Fig.Draw-1.37).

The **Slide1** displays on the Work place (Fig.Draw-1.38).

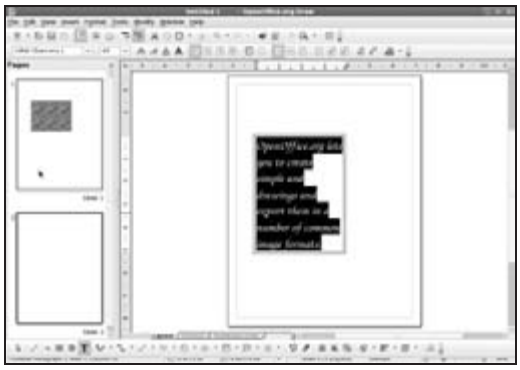


Fig.Draw-1.37

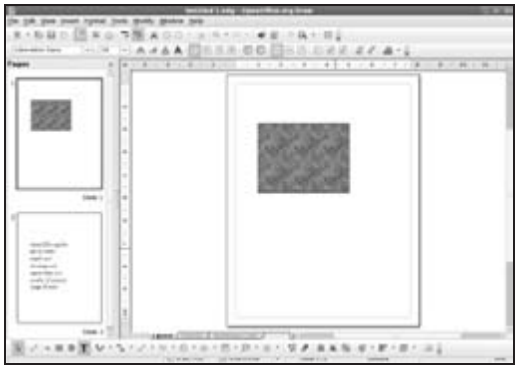


Fig.Draw-1.38

In this section, you have learned to work with slides. Now, let's learn to modify objects in the following section.

Saving the Draw Document

You should always save your document so that you can retrieve it whenever you want.

Let's perform the following steps to save the Draw document:

1. *Click* the **File** menu in the menu bar. A drop-down menu appears (Fig.Draw-1.39).
2. *Select* the **Save** option from the drop-down menu (Fig.Draw-1.39).
   The **Save** dialog box appears (Fig.Draw-1.40).

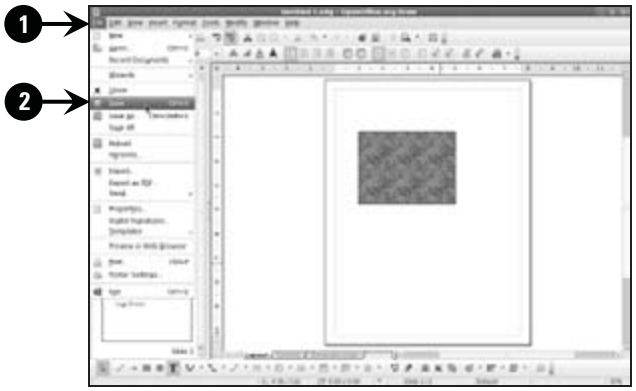


Fig.Draw-1.39



Fig.Draw-1.40

3. *Type* the name for your document beside the **Name** text box. In our case, we have typed the **mydoc** (Fig.Draw-1.41).
4. *Click* the **Save** button (Fig.Draw-1.41).

The document is saved with the name mydoc.odg (Fig.Draw-1.42).

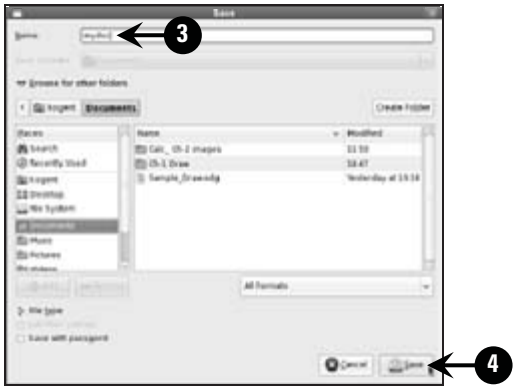


Fig.Draw-1.41

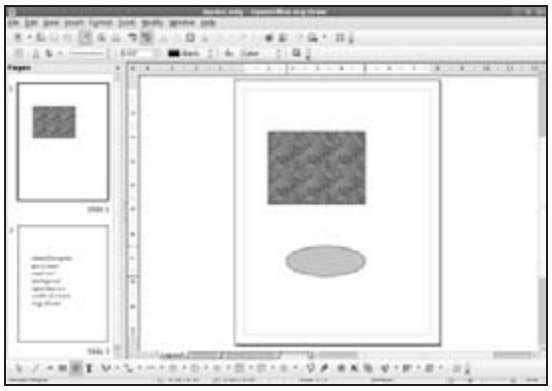


Fig.Draw-1.42

After saving the document, let's learn about modifying objects.

Modifying Objects

Draw provides you with various modification tools to apply a number of effects, such as rotate and flip on objects to change their appearance. In this section, we learn to rotate and align an object.

Let's first learn to rotate an object.

Rotating an Object

You can rotate any object inserted in your document to change its appearance.

Let's perform the following steps to rotate an object:

1. Create a new object that you want to modify. In our case, we have created an ellipse object (Fig.Draw-1.43).
2. *Select* the object that you want to rotate. In our case, we have selected the **ellipse** object (Fig.Draw-1.43).
3. *Click* the **Effects** button in the **Drawing toolbar** (Fig.Draw-1.43).
4. *Position* the mouse-pointer on the edges of the ellipse object. The mouse-pointer changes to the rotate cursor (Fig.Draw-1.44).

5. D*rag* the mouse-pointer in an angular direction in the Work place to rotate the object. As you rotate the mouse-pointer, the shadow of the ellipse also rotates (Fig.Draw-1.44).

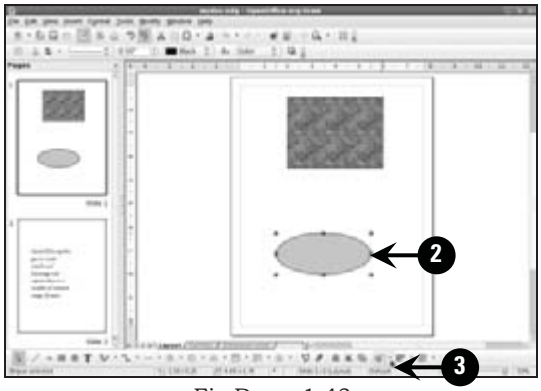


Fig.Draw-1.43

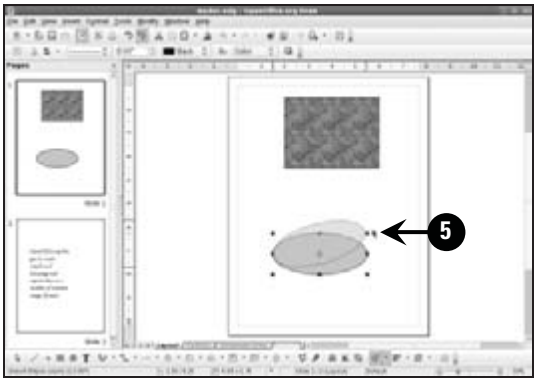


Fig.Draw-1.44

The ellipse object is rotated, as shown in Fig.Draw-1.45:

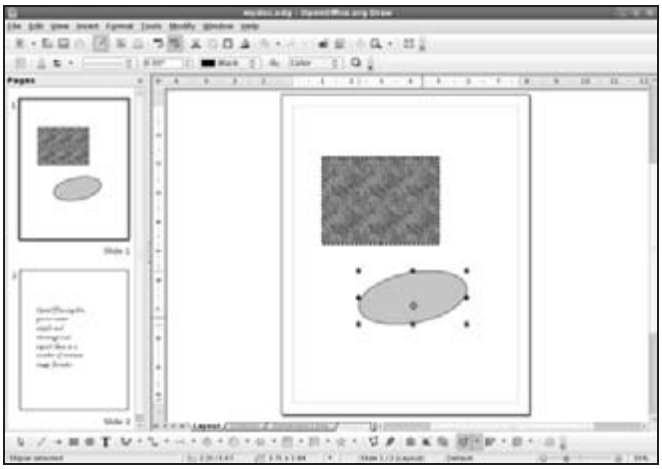


Fig.Draw-1.45

After learning to apply the rotate effect, let's now learn to apply the 3D rotation effect.

Applying the 3D Rotate Effect

The In 3D Rotation Object option allows you to view an object as a 3D model.

Let's perform the following steps to apply the 3D rotation effect on an object:

1. *Select* the object to apply the 3D rotation effect. In our case, we have selected the **ellipse** object (Fig.Draw-1.46).
2. *Click* the **Effects** button in the **Drawing toolbar.** A list of effect options appears (Fig.Draw-1.47).
3. *Select* the **In 3D Rotation Object** option from the list of effects (Fig.Draw-1.47).

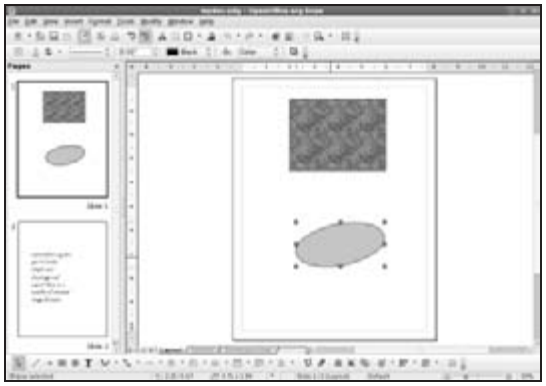


Fig.Draw-1.46

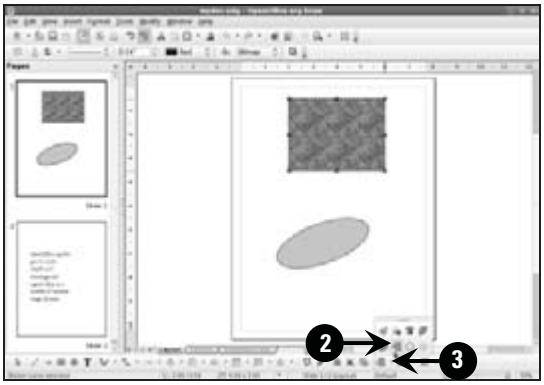


Fig.Draw-1.47

4. *Select* the ellipse object in the Work place. The shadow of the ellipse object appears on its left (Fig.Draw-1.48).
5. *Click* anywhere in the Work place (Fig.Draw-1.48).

The ellipse is converted into a 3D object (Fig.Draw-1.49).

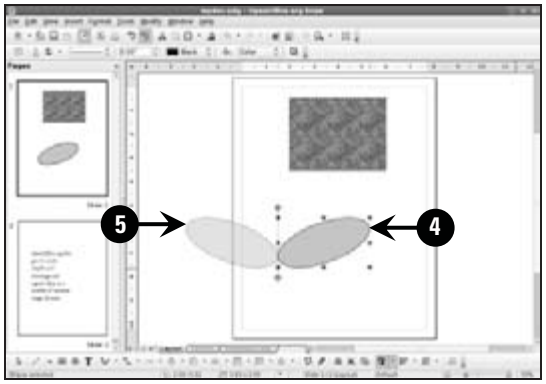


Fig.Draw-1.48

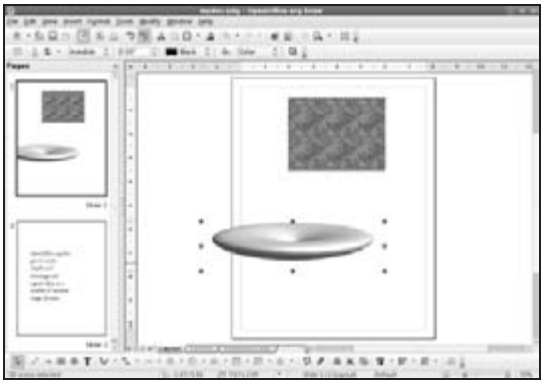


Fig.Draw-1.49

After learning to apply the 3D effect in an object, let's now learn to apply the distort effect.

Applying the Distort Effect

The distort effect allows you to give your object either an irregular (distorted) shape or a new, regular (skewed) shape. This tool lets you to move only one edge or corner of an object, thereby, changing its shape.

Let's perform the following steps to apply the distort effect on an object:

1. *Select* the object to apply the distort effect. In our case, we have *selected* the **rectangle** object (Fig.Draw-1.50).
2. *Click* the **Effect** button in the **Drawing toolbar.** A list of effects appears (Fig.Draw-1.50).
3. *Select* the **Distort** option from the list of effect option (Fig.Draw-1.50).

   As the rectangle object is filled with the bitmap texture, a message box appears asking whether you want to convert the object to a curve (Fig.Draw-1.51).
4. *Click* the **Yes** button (Fig.Draw-1.51).

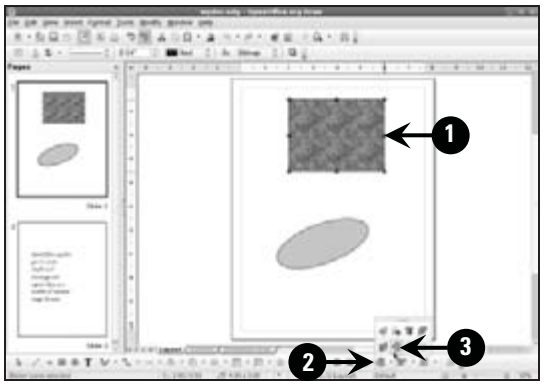


Fig.Draw-1.50



Fig.Draw-1.51

5. *Position* the mouse-pointer on the edge of the object (Fig.Draw-1.52).
6. Drag the mouse-pointer towards the left direction on the Work place. The bottom edge of the rectangle also moves (Fig.Draw-1.52).

The distort effect is applied to the rectangle object (Fig.Draw-1.53).

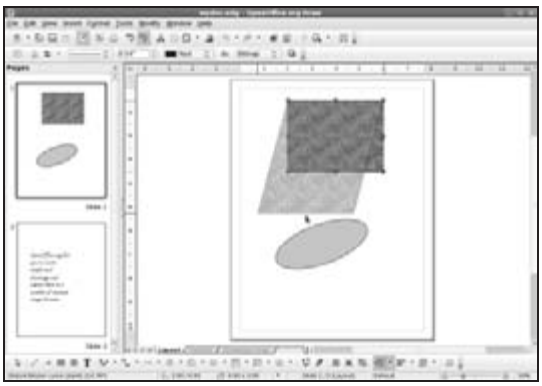


Fig.Draw-1.52

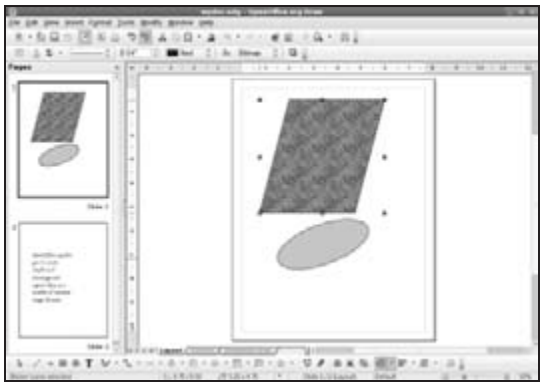


Fig.Draw-1.53

Let's learn about introducing the set to circle effect.

Introducing the Set to Circle effect

The Set to circle (slant) option from the list of effect option in the Effects button can be used to wrap an object around imaginary circles. If you try to apply this effect to an object, which is neither a polygon nor a curve then Draw displays a message box. The message box indicates whether you want to change the object into a curve. If you click the Yes button in the message box, the set to circle (slant) effect is applied to the object.

Let's perform the following steps to apply the set to circle effect:

1. *Create* a text frame to apply the set to circle (slant) effect (Fig.Draw-1.54).
2. *Select* Slide2 from the Slide pane. The Slide2 appears on the working area (Fig.Draw-1.54).
3. *Click* the Insert menu in the menubar. A drop-down menu appears (Fig.Draw-1.54).
4. Select the Slide option from the list (Fig.Draw-1.54).

A new s**lide** named as Slide3 appears on the screen (Fig.Draw-1.55).

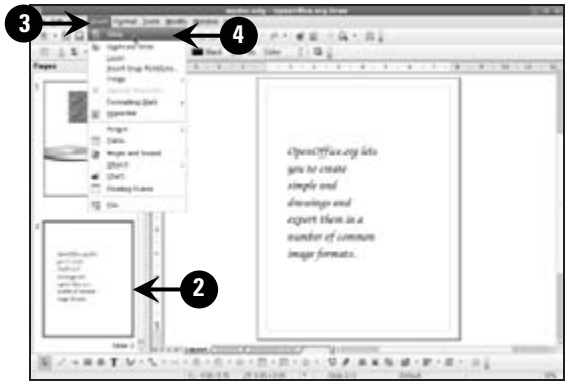


Fig.Draw-1.54

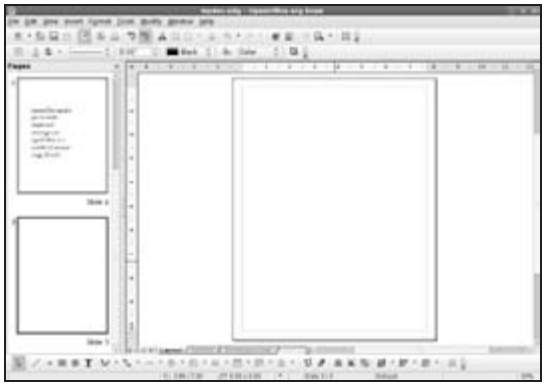


Fig.Draw-1.55



When you insert a new slide, it is automatically inserted next to the active slide. For example, if your document contains three slides and you are working in Slide 1 and insert a new slide, the new slide would be placed next to Slide 1.

5. *Click* the **Text** button from the Drawing toolbar (Fig.Draw-1.56).
6. *Position* the mouse-pointer on the slide where you want to create a text frame. The mouse-pointer changes to the text tool (Fig.Draw-1.56).
7. *Drag* the mouse-pointer on the Work place to create a text frame (Fig.Draw1.56).
8. *Type* the desired text in the text box. In our case, we have typed the text **OpenOffice.org Draw** (Fig.Draw-1.57).

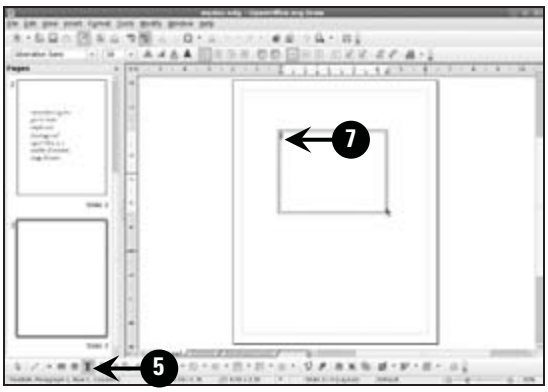


Fig.Draw-1.56

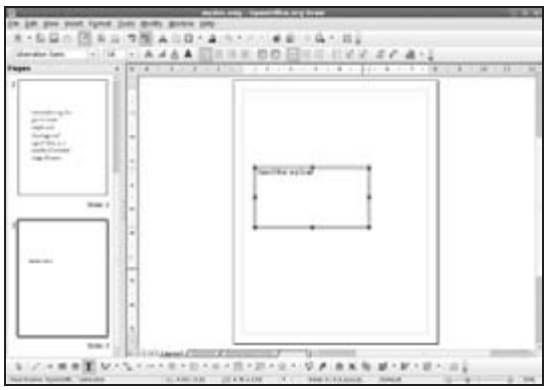


Fig.Draw-1.57

9. *Click* the **Effects** button in the **Drawing toolbar**. A list of effects appears (Fig.Draw-1.58).
10. *Select* the **Set to circle (slant)** option from the list of effects (Fig.Draw-1.58).

    A message box appears asking you whether you want to convert the selected object to a curve (Fig.Draw-1.59).
11. *Click* the **Yes** button in the message box (Fig.Draw-1.59).

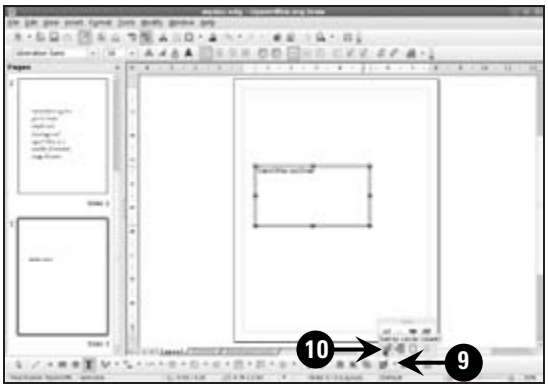


Fig.Draw-1.58



Fig.Draw-1.59

The text edges appear in the grid (Fig.Draw-1.60).

12. *Select* any corner handle of the text frame.
13. *Drag* the mouse-pointer on the Work place to increase the size of the text frame (Fig.Draw-1.61). The text is wrapped in a circular shape (Fig.Draw-1.61).



Fig.Draw-1.60

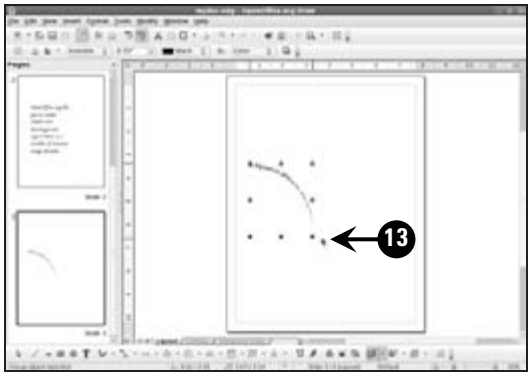


Fig.Draw-1.61



You can cancel the last change that you have made to your document by clicking the undo button available in the toolbar. You can also access this option from the Edit menu.

Let's now learn to work with slides.

After learning how to switch between slides, let's learn how to arrange objects in a slide.

Arranging Objects in a Slide

You have already learned to insert an object in a slide. However, the problem arises when you need to place more than objects on a single slide. Some of these objects may be large than others; therefore, they must be placed in such a way so as not to overlap the smaller objects. Let's perform these steps to learn how to arrange multiple objects on a slide:

1. *Insert* a new slide in your document by selecting the Slide option from the **Insert** menu (Fig.Draw-1.62).
2. *Click* the **Basic Shapes** button in the **Drawing toolbar.** A list of shapes options appears (Fig.Draw-1.62).
3. *Select* the **Circle** shape from the list of shapes (Fig.Draw-1.62).
4. *Position* the mouse pointer at that location in your slide where you want to draw a circle (Fig.Draw-1.63).

5. *Drag* the mouse-pointer on the Work place to draw the circle (Fig.Draw-1.63).

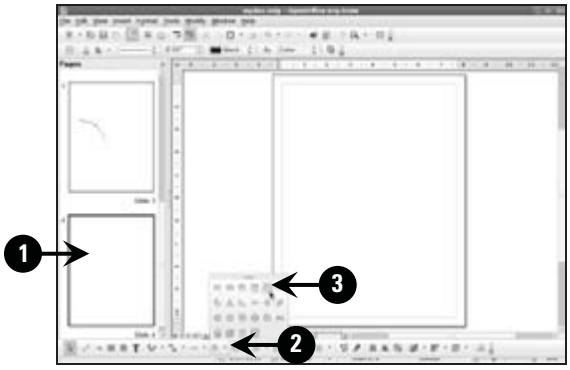


Fig.Draw-1.62

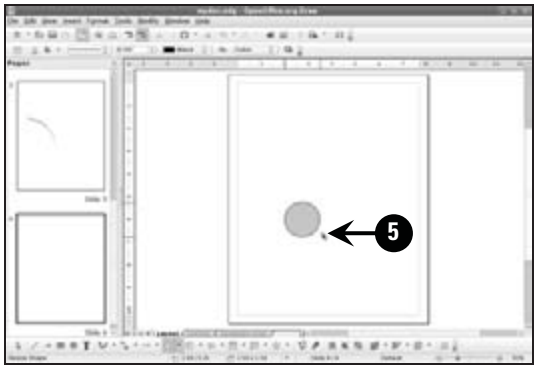


Fig.Draw-1.63

6. Create one more circle (bigger than the previous circle) on the surface of the previous circle (Fig.Draw-1.64).

   Similarly, draw another circle (bigger than the previous two circles) on the surface of the previous two circles (Fig.Draw-1.65).

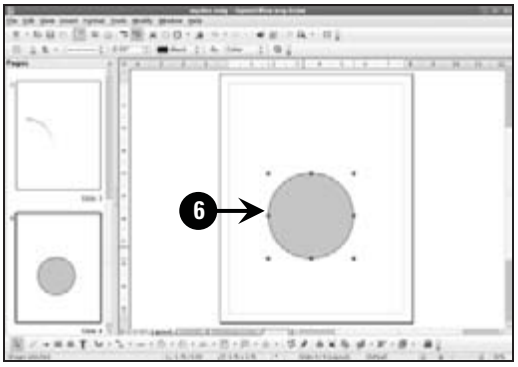


Fig.Draw-1.64

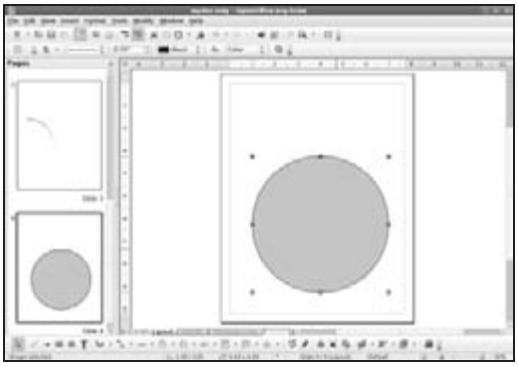


Fig.Draw-1.65

7. *Select* the **Arrange** option from the **Drawing toolbar** (Fig.Draw-1.66).

   A list of options appears (Fig.Draw-1.67).

8. *Select* the **Send to Back** option from the list (Fig.Draw-1.67).

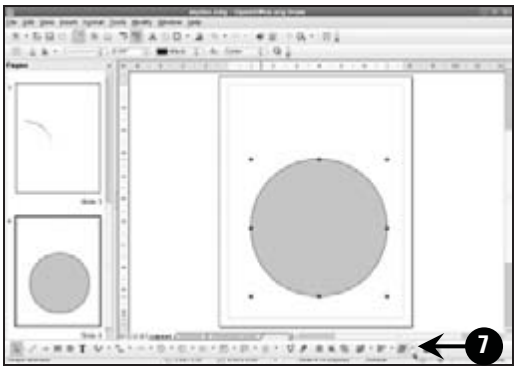


Fig.Draw-1.66

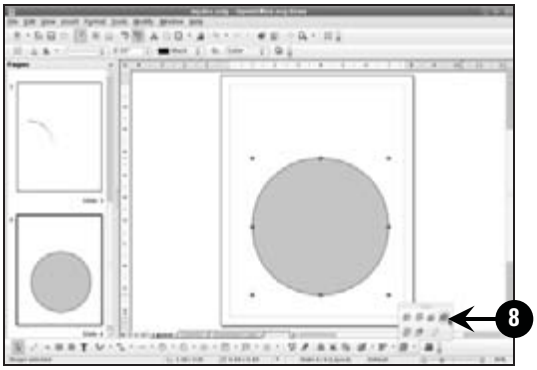


Fig.Draw-1.67

This option sends the currently selected object behind all other objects. The medium sized circle is also visible now (Fig.Draw-1.68).

Continue with the following steps to bring the smallest circle to front:

9. *Click* anywhere in the empty space of the document.
10. *Click* the **Select** button in the **Drawing toolbar** (Fig.Draw-1.69).
11. *Select* the middle sized circle in the document. The middle sized circle get selected (Fig.Draw-1.69).

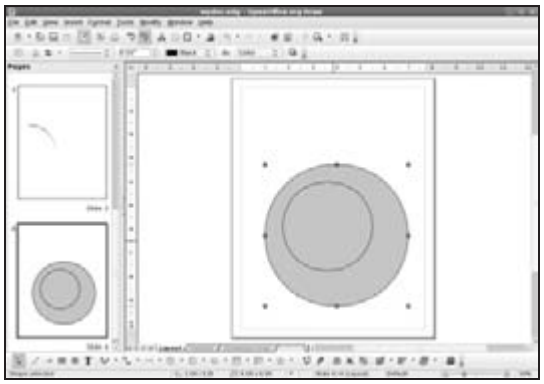


Fig.Draw-1.68

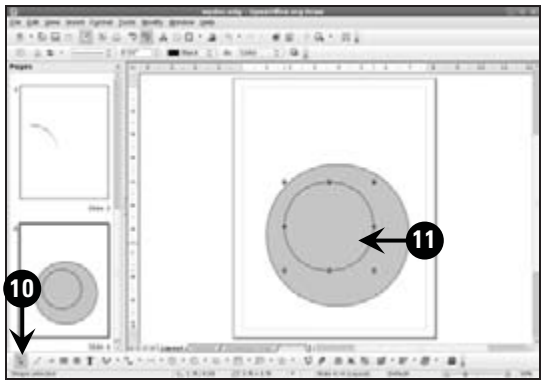


Fig.Draw-1.69

12. *Click* the **Arrange** button in the **Drawing toolbar**. A list of arrange options appears (Fig.Draw-1.70).
13. *Select* the **Send Backward** option in the **Arrange** option (Fig.Draw-1.70).

All the three circles are now visible on the Drawing (Fig.Draw-1.71).

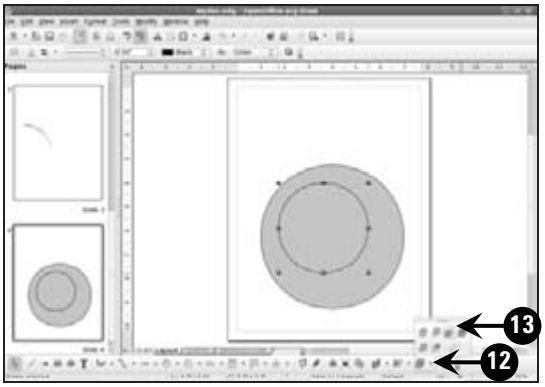


Fig.Draw-1.70

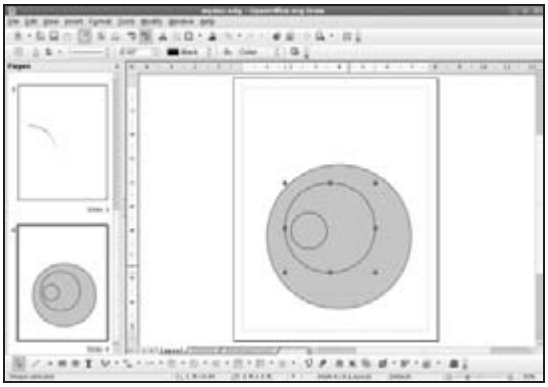


Fig.Draw-1.71

After learning about arranging multiple objects on a slide, let's now learn how to align objects

Aligning the Objects

The Alignment options allow you to adjust the placement of an object with respect to other objects placed in the slide.

Let's perform the following steps to align different objects in a slide:

1. Insert some objects in a slide. In our case, we have inserted ellipse, square, and cross objects in the slide (Fig.Draw-1.72).
2. *Click* the **Select** button in the **Drawing toolbar** (Fig.Draw-1.72).
3. D*rag* the mouse-pointer to select all the objects in the slide (Fig.Draw-1.73).

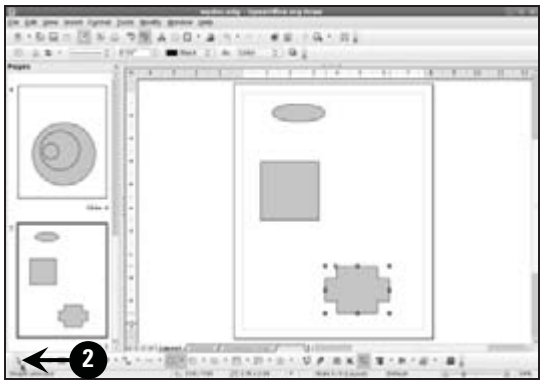


Fig.Draw-1.72

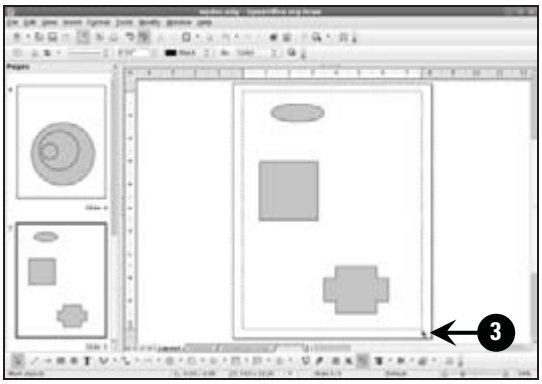


Fig.Draw-1.73

All the objects within the selection box get selected (Fig.Draw-1.74).

4. *Click* the **Alignment** button in the **Drawing toolbar**. A list of alignment options appears (Fig.Draw-1.75).
5. *Select* the **Left** option from the list of alignment options (Fig.Draw-1.75).

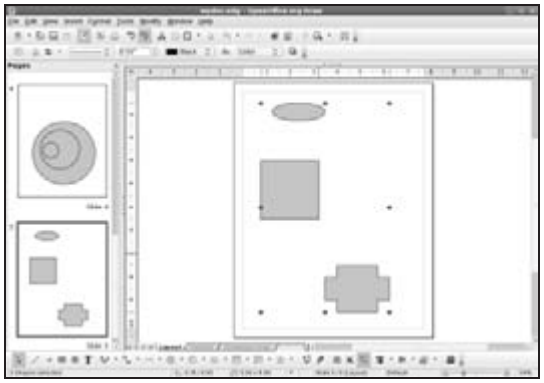


Fig.Draw-1.74

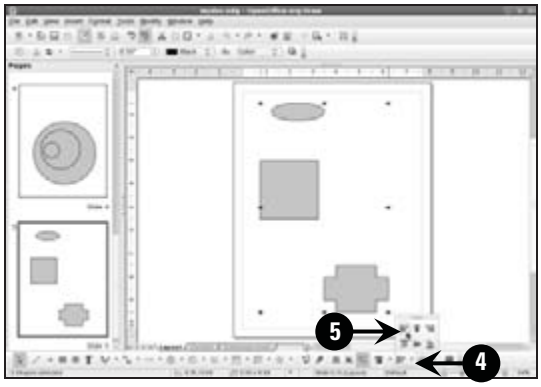


Fig.Draw-1.75

The selected objects are aligned to the left of the slide, as shown in Fig.Draw-1.76:

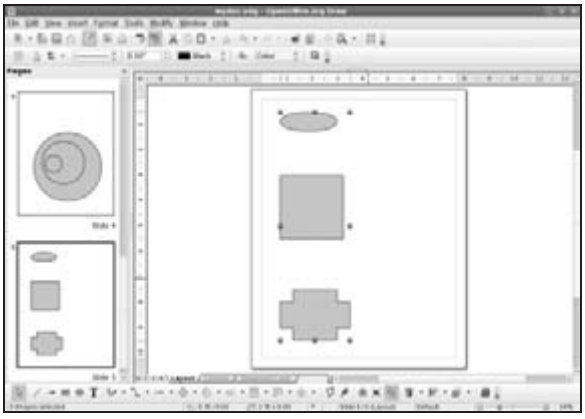


Fig.Draw-1.76

Let's proceed to learn how to create and work with groups in the next section.

Working on a Group

While working with objects in a Draw document, you may need to perform some similar tasks on a number of objects in the same slide. Instead of repeating the same steps to modify each object separately, you can group these objects together and then modify them all by just modifying the complete group. Let's learn about grouping objects.

Grouping Objects

You can put any number of objects together in a group. All the objects in a group get selected together and whatever changes you apply on one object are automatically applied to all the objects of the group.

Let's perform the following steps to group the objects in a slide:

1. *Select* the first object that you want to set as a group. In our case, we have selected the ellipse object (Fig.Draw-1.77).
2. *Press* and hold the **SHIFT** key on the keyboard and *select* the second object that you want to add in the group. In our case, the second object is square (Fig.Draw-1.77).
3. *Press* and hold the **SHIFT** key on the keyboard and *select* the third object that you want to add in the group. In our case, the third object is cross (Fig.Draw-1.77).
4. *Click* the **Modify** menu in the menubar. A drop-down menu appears (Fig.Draw-1.78).
5. *Select* the **Group** option from the drop-down menu (Fig.Draw-1.78).

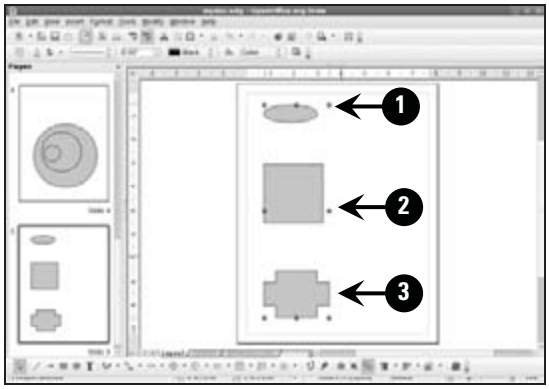


Fig.Draw-1.77

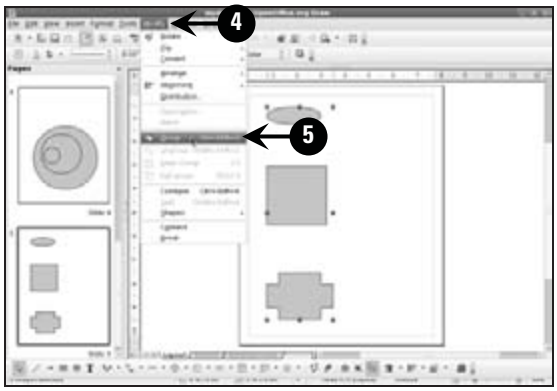


Fig.Draw-1.78

The selected objects are grouped, as shown in Fig.Draw-1.79:

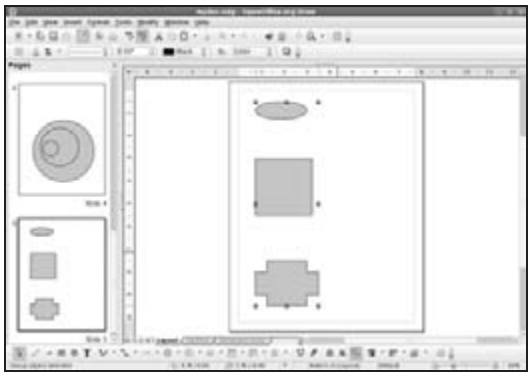


Fig.Draw-1.79

The settings you perform on the grouped objects get applied to all the objects of the group.

After grouping objects, let's now learn to move a group.

Moving a Group

You can change the position of all the objects of a group by moving the group.

Let's perform the following steps to learn how to move a group:

1. *Click* the *Select* tool in the **Drawing toolbar** (Fig.Draw-1.80).
2. *Position* the mouse-pointer on the grouped object. The handles appear around the grouped objects, indicating that the entire group has been selected (Fig.Draw-1.80).
3. *Drag* the mouse-pointer towards the right. The grouped objects moved to the right together, as shown in Fig.Draw-1.80:

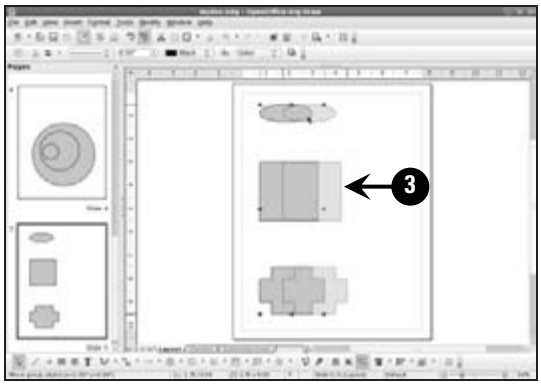


Fig.Draw-1.80

Let's now learn to merge and combine the objects.

Merging and Combining Objects

In Draw, you cannot only create and modify different types of object but also combine and merge these objects. The Combine option is used to combine two or more objects into one object. When you apply the Combine option on two or more overlapping objects, the intersecting lines between the objects disappear and the objects merged into a single object.

Let's perform the following steps to learn how to combine different objects:

1. *Insert* a new slide in your document by selecting the **Slide** option of the **Insert** menu.
2. *Add* some objects to this slide in such a way that they intersect one another. In our case, we have added three objects, as shown in Fig.Draw-1.81:

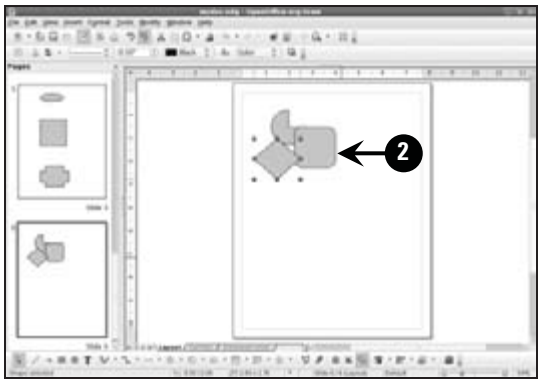


Fig.Draw-1.81

3. *Select* all the objects, as shown in Fig.Draw-1.82:

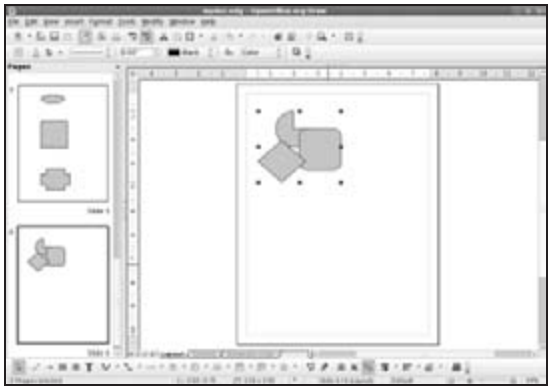


Fig.Draw-1.82

4. *Click* the **Modify** menu in the menubar. A drop-down menu appears (Fig.Draw-1.83).
5. *Select* the **Combine** option from drop-down menu, as shown in Fig.Draw-1.83:

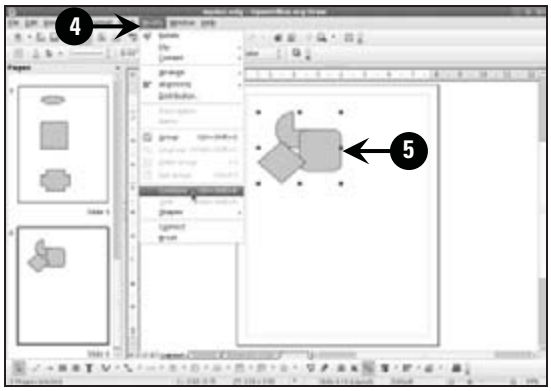


Fig.Draw-1.83

6. *Click* the Line Style list box in the toolbar and select the **Invisible** option from the drop-down list (Fig.Draw-1.84).

   The outline disappears and objects appeared as combined, as shown in Fig.Draw-1.84:

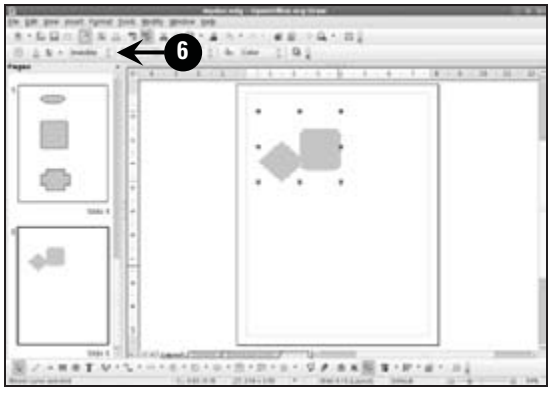


Fig.Draw-1.84

7. *Click* the **File** menu in the menubar. A drop-down menu appears (Fig.Draw-1.85).
8. *Select* the **Save** option from the drop-down menu, as shown in Fig.Draw-1.85:

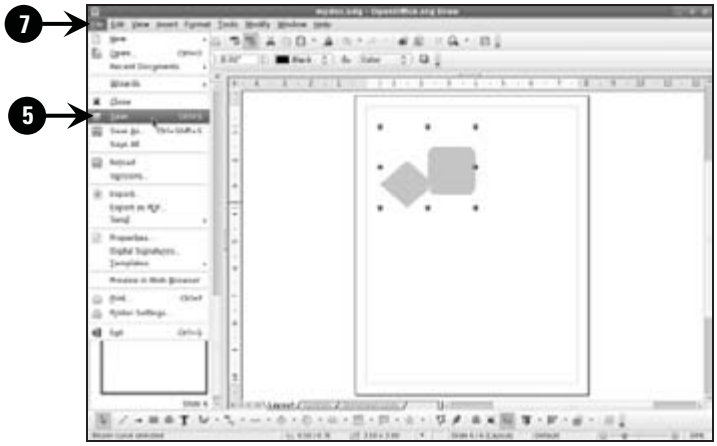


Fig.Draw-1.85

The mydoc Draw document gets saved.

Quitting the Application

Let's perform the following step to quit the application:

1. *Click* the **File** menu in the menubar. A drop-down menu appears (Fig.Draw-1.86).
2. *Select* the **Exit** option from the drop-down menu, as shown in Fig.Draw-1.86:

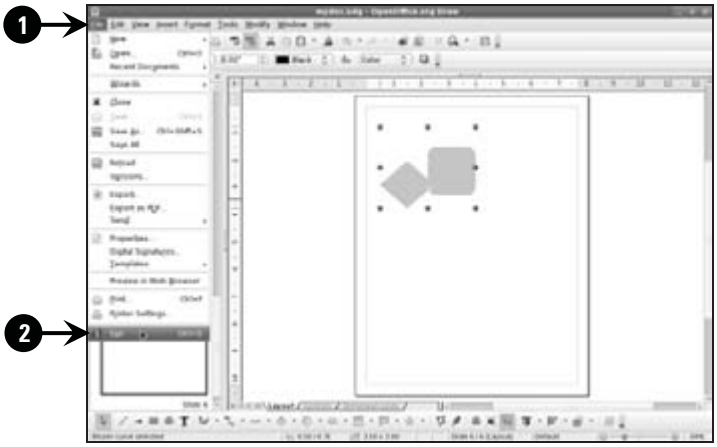


Fig.Draw-1.86

The OpenOffice.org Draw application is closed.



You can close the currently opened document of Draw by selecting the Close option from the File menu.

Let's now recapitulate the main points of this chapter.

Summary

In this chapter, you have learned how to open the Draw application window and work with its user interface. In addition, you have learned how to work with slides, such as inserting slides in a document, switching between slides, and arranging and aligning objects in a slide. Next, you have learned how to work with objects, such as creating objects, changing the properties of objects, selecting multiple objects, and applying effects of objects. Next, the chapter also made you familiar with the process of grouping multiple objects and performing functions on them collectively. Further, you learned how to merge and combine different objects in a way that they appear as a single object. At last, you learned how to save the changes in a Draw document and quit the application.

CHAPTER

1

Introducing GIMP

In this Chapter:

- Exploring the Features of GIMP
- Getting Started with GIMP
- Working with Images
- Working with Colors
- Capturing Pictures by Using GIMP
- Saving a File
- Closing a File and Quitting GIMP

Linux installation package comes equipped with a number of programs and utilities that are very useful for working with different types of objects and applications. In this chapter, you learn about one such useful program, called **GIMP.** Short for **GNU Image Manipulation Program**, GIMP is a bitmap-based graphics program that enables you to edit images in various ways. It is a powerful and free image-editing program available for Unix and Linux. GIMP is essentially used as an image retouching and editing tool. It can also be used for freeform drawing and image composition, as well as for resizing, editing, and cropping of images. It is a convenient tool for creating logos and other graphics for Web pages. GIMP supports a number of file formats and lets you import and export images to and from other graphics programs, such as Photoshop. Apart from this, it allows you to capture screenshots and save them in a desired format.

This chapter begins by discussing the various features of GIMP. It then shows you how to get started with GIMP and also familiarizes you with its interface. You also learn to perform basic tasks with GIMP, such as working with images and colors, capturing images, and saving a file. Toward the end, you learn to close a file and quit from the GIMP program.

Exploring the Features of GIMP

GIMP is a very efficient graphics editing program. It includes the capabilities of a photo editor, a picture capturing, and an image manipulation. Apart from this, GIMP includes a host of features that make working with the program a lot of fun. The following are the salient features of GIMP:

- **User-friendly**: Provides a user-friendly interface that includes a Toolbox that allows you to conveniently select a tool, set the options for the selected tool, and edit image easily. You can work on images by using various tools such as Pencil Tool, Paintbrush Tool, and Eraser Tool, in the same way as you would with real brushes and pencils.
- **Platform-independent**: Supports other platforms, such as Apple Macintosh, Windows, Linux, and OS/2. This means that you can open and save images in a number of image file formats in GIMP. You can also import and export the images from and to other programs and systems without difficulty.
- **Open source**: Implies that GIMP is an open source program, which means that it is freely available to everyone. It is a built-in program of Fedora 11.
- **Useful floating palettes**: Provides various floating palettes in the form of a window that contains a number of options for creating and modifying the images. This window can be moved to any part of the desktop.
- **Layer features**: Provides you different features to apply on different parts of an image. When you define a layer containing a portion of an image, the layer is separated from the other parts of that image. You can apply different image properties to the portion of the image without affecting the rest of the image.

Let's begin by starting the GIMP program.

Getting Started with GIMP

As you know, GIMP is a built-in program of Fedora 11. Therefore, after installing Fedora 11 on your system, you can open GIMP to work.

Perform the following steps to start GIMP:

1. *Click* the **Applications** menu from the panel menubar of the GNOME desktop. A drop-down list appears (Fig. G-1.1).
2. *Select* the **Graphics** option from the drop-down list (Fig.G-1.1). A submenu appears (Fig.G-1.1).
3. *Select* the **GNU Image Manipulation Program** option from the submenu (Fig.G-1.1).

   A GIMP splash screen appears (Fig.G-1.2).

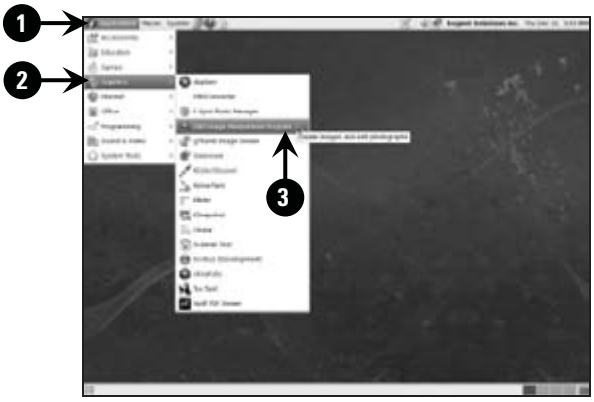


Fig.G-1.1



Fig.G-1.2

After few seconds, the GNU Image Manipulation Program window opens, as shown in Fig.G-1.3:

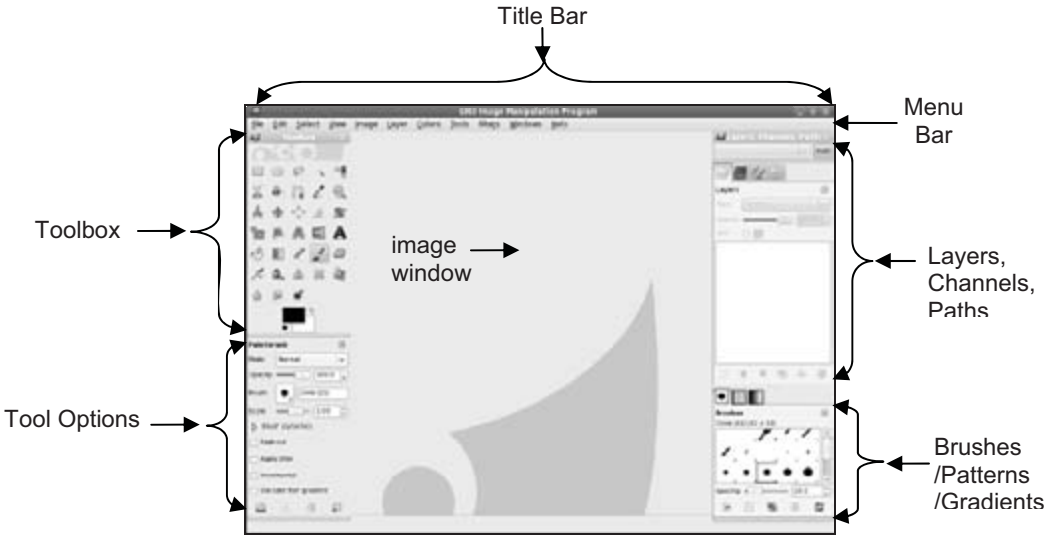


Fig.G-1.3

Fig.G-1.3 shows the various components that make up the interface of the GIMP program. Let's now explore these components.

Exploring the Interface of GIMP

The interface of GIMP is quite different from that of the other programs you have worked with so far. A major difference is that the GIMP interface is that contains various docked windows that can be moved outside the GIMP interface. Generally, when you open a program, a single window opens on the screen, containing all the menus and options of the program. The GIMP interface contains the following components:

- **Title bar:** Refers to the topmost bar of the GNU Image Manipulation Program window. It displays the title of currently open image. The right side of the Title bar contains the Minimize, Restore/Maximize, and Close buttons.
- **Menu bar:** Contains various menus that you can use to manipulate images. For example, the File menu contains the options used to work with files, such as creating a new file, opening an existing file, and capturing pictures in a file; the Edit menu contains options to cut, copy, and paste images;

and the Help menu contains options that allow you to access information on the various features of GIMP.

- **Toolbox:** Contains various icons in the form of buttons that you use to activate tools. By using these tools, you can select an image or a part of the image, paint an image, or transform an image. The Toolbox also contains the foreground and background color boxes that allow you to set the foreground and background colors of an image The Toolbox is also called a utility window.
- **Tool Options:** Displays the name of the currently selected tool from the Toolbox, and the options related to the tool. The Tool Options window is attached with the Toolbox.
- **Image window**: Refers to the window that contains an image. If no image is opened, then Title bar in an image window displays GNU Image Manipulating Program. You can open more than one image window. Each window is known as image window.
- **Layers, Channels & Paths:** Refers to a window, which is a combination of three windows, namely Layers, Channels, and Paths, and appear as three tabs. The Layers tab displays the options used to work with different layers of an image. Layers are sheets of pixels that are placed one over the other to make a complete image. The Channels tab displays the options for working with the channels of an image. Each pixel in an image is a combination of the red, green and blue colors. Each of these colors is considered a channel. The Channels tab contains the options that are used to work with these color channels. The Paths tab provides options for working with paths, including creating and deleting them.
- **Brushes/Patterns/Gradients**: Refers to a window, which is a combination of three windows, namely Brushes, Patterns, and Gradients. These windows contain three tabs for to manage brushes, patterns, and gradients. Brushes are tools that are used to paint on an image. Gradients refer to as set of colors that is used in an image. They allow you a smooth transition from one color to another. A pattern is an image, used for filling regions are used to fill the selected area of an image.

Now that you know the various components of GIMP interface, let's learn to open a new file in GIMP.

Opening a New File

You can open a new file in GIMP. You can use a new file to work on a copy of an image when you do not want to make any changes to the original image.

Perform the following steps to open a new blank file:

1. *Click* the **File** menu from the Menu bar of GNU Manipulation Program window (Fig.G-1.4). A drop-down menu appears (Fig.G-1.4).
2. *Select* the **New** option from the drop-down menu, as shown in Fig.G-1.4:



Fig.G-1.4

The **Create a New Image** dialog box appears (Fig.G-1.5). You can use this dialog box to change the size of an image by setting its width and height from the Width and Height spin boxes, respectively.

3. *Click* the **OK** button, as shown in Fig.G-1.5:



Fig.G-1.5

A new file named Untitled1.0 appears in the image window, as shown in Fig.G-1.6:



Fig.G-1.6

4. *Click* the **Close** button on the Title bar of the **Layer, Channels & Paths** window to close the window, as shown in Fig.G-1.7:

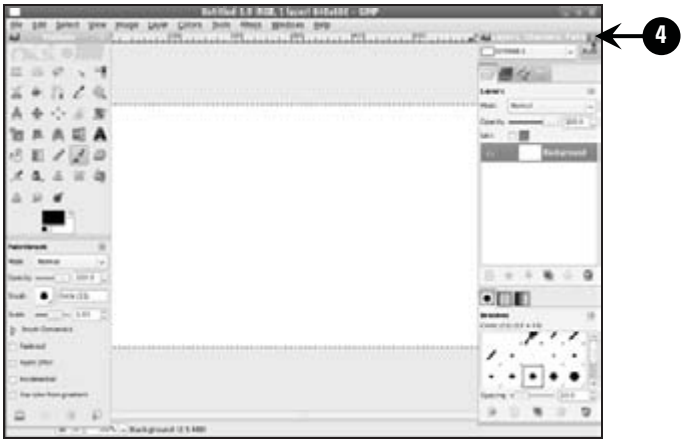


Fig.G-1.7

After opening a **new** file in GIMP, let's quickly move to the next topic and learn to work with images in GIMP**.**

Working with Images

You need to open an image in GIMP to work with it. GIMP allows you to work with an image in various ways. You can edit the image by re-sizing or rotating it, as well as apply the foreground or background color in the image. GIMP provides you separate tools to perform each of these tasks. For example, Rotate Tool and Scale Tool allow you to rotate and scale an image, respectively.

Let's begin by learning to open an image file.

Opening an Image File

If you want to make any changes in a GIMP image, you need to first open its file. You can open an image in GIMP from the File menu.

Perform the following steps to open an image file in GIMP:

1. *Click* the **File** menu from the Menu bar (Fig.G-1.8). A drop-down menu appears (Fig.G-1.8).
2. *Select* the **Open** option from the drop-down menu (Fig.G-1.8).

   The **Open Image** dialog box appears (Fig.G-1.9).
3. *Select* the folder that contains the image you want to open, from the **Places** pane. In our case, the name of the folder is **Pictures** (Fig.G-1.9).
4. *Select* the image from the middle pane. In our case, we have selected the **large-pluto26.jpg** image.
5. *Click* the **Open** button (Fig.G-1.9).

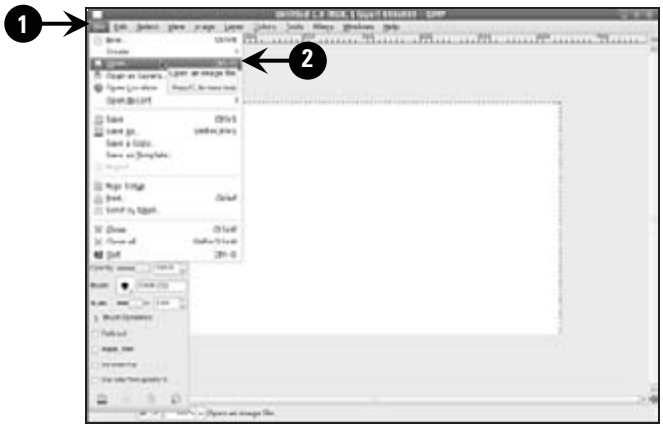


Fig.G-1.8

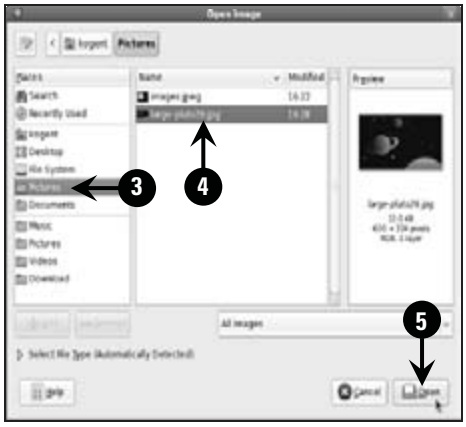


Fig.G-1.9

The selected image opens in a new image window, as shown in Fig.G-1.10:



Fig.G-1.10

Whenever you open an image in GIMP, it opens in a separate image window. You can also open multiple images simultaneously.

Let's now learn to copy an image.

Copying an Image

Sometimes, you may want to know how an image would appear if certain changes are made to it but do not want to change the original image or alter it permanently. If you work directly on the image, you may accidentally spoil its appearance. To avoid this, you can copy the image and paste it on a new file window and then work on it. In GIMP, you can easily create a copy of an image.

Perform the following steps to copy an image in GIMP:

1. *Open* an image. In our case, we are using the image (Fig.G-1.10).
2. *Click* the image window (Fig.G-1.11). This image window becomes active.
3. *Select* the **Edit** menu from the Menu bar. A drop-down menu appears (Fig.G-1.11).
4. *Select* the **Copy** option from the drop-down menu (Fig.G-1.11).
   A copy of the image is placed in the clipboard area of the memory of the computer.
5. *Open* a new file. In our case, we are using the file named Untitled-1.0, which is already open.
6. *Click* the Untitled-1.0 GIMP window to activate the window (Fig.G-1.12).

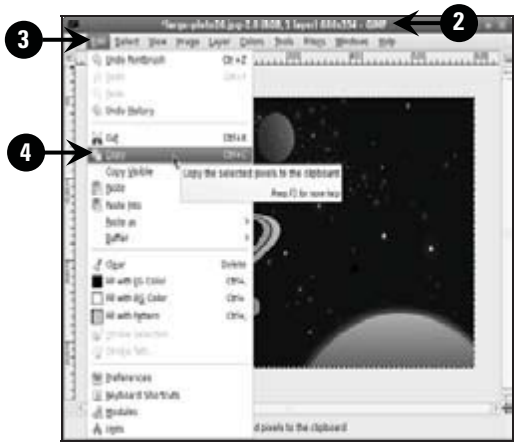


Fig.G-1.11

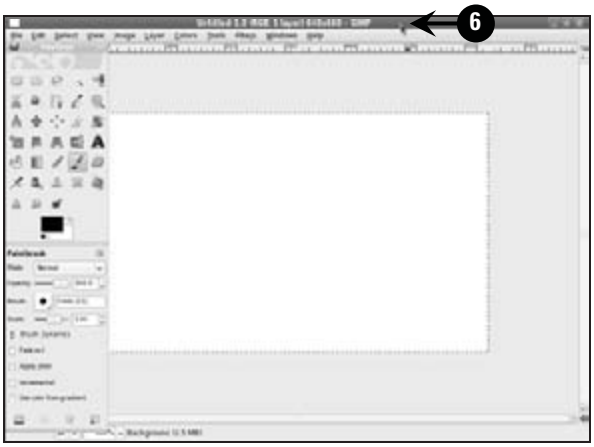


Fig.G-1.12

7. *Click* the **Edit** menu from the Menu bar (Fig.G-1.13). A drop-down menu appears (Fig.G-1.13).
8. *Select* the **Paste** option from the drop-down menu, as shown in Fig.G-1.13:



Fig.G-1.13

The image is pasted to the Untitled-1.0 file, as shown in Fig.G-1.14:



Fig.G-1.14

Let's now learn to close the image.

Closing an Image

After opening an image, you can make the changes you want in the image. In our case, we have created a copy of an image. You can work on this image while keeping its original safe and unaltered. After making the changes, you can close the image.

Perform the following steps to close an image in GIMP:

1. *Select* the image window that you want to close, from the bottom panel of the desktop (Fig.G-1.15). In our case, we want to close the original image whose copy we created in the preceding section (Fig.G-1.14).



Fig.G-1.15

   The image window of the selected image is activated (Fig.G-1.16).
2. *Click* the **File** menu (Fig.G-1.16). A drop-down menu appears (Fig.G-1.16).
3. *Select* the **Close** option from the drop-down menu (Fig.G-1.16).

   A message box appears, asking you whether you want to save the image or not. We don't want to modify the original image, so, we close the image file without saving it.
4. *Click* the **Don't Save** button (Fig.G-1.17).

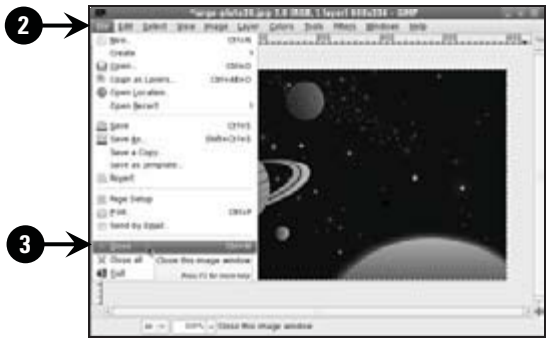


Fig.G-1.16



Fig.G-1.17

The image (image large-pluto26.jpg-2.0) closes and you return to the Untitled-1.0 window, as shown in Fig.G-1.18:



Fig.G-1.18

Let's now learn to edit an image.

Editing Images

You can modify a GIMP image in a number of ways. For example, you can change the size of an image, rotate it to an angle, or crop it. Before working with the size of an image, you need to understand an important concept called resolution. Resolution is defined as the number of pixels per unit of the area of an image. Its unit of measurement is pixels per inch (ppi). The appearance of an image depends on its resolution. The higher the resolution, the clearer the image is. However, if the number of pixels per inch is too high, the image may appear excessively sharp.

In the following section, you learn to change the size of an image and rotate an image.

Changing the Image Size

GIMP allows you to change the size of an image to suit your requirements. You can increase or decrease the width and height of an image. You can also change the resolution of the image, which affects the number of pixels per inch of the image. This in turn affects the appearance of the image.

Perform the following steps to change the size of an image in GIMP:

1. *Open* the image whose size you want to change. In our case, we are using the image we opened in the preceding section (Fig.G-1.18).
2. *Click* the **Image** menu from the Menu bar (Fig.G-1.19).

   A drop-down menu appears (Fig.G-1.19).
3. *Select* the **Scale Image** option from the drop-down menu, as shown in Fig.G-1.19:

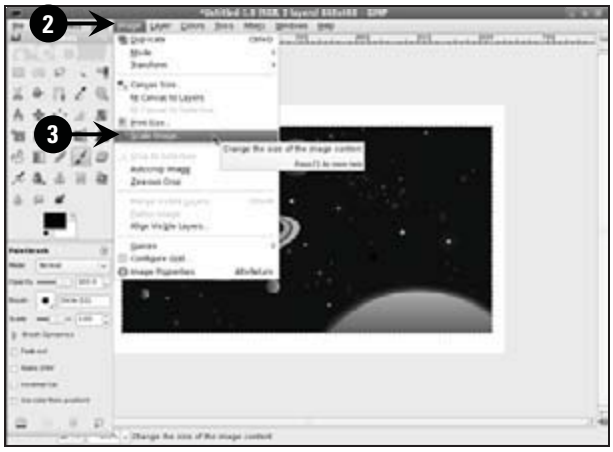


Fig.G-1.19

The **Scale Image** dialog box appears (Fig.G-1.20).

4. *Click* the down arrow in the spin box next to the **Height** spin box (Fig.G-1.21).



Fig.G-1.20

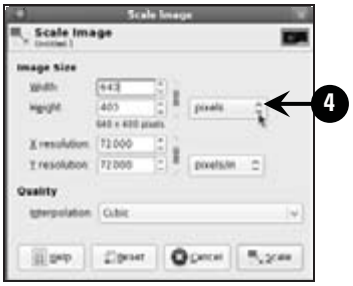


Fig.G-1.21

A drop-down list appears, displaying several unit options to define the image size (Fig.G-1.22).

5. *Select* a unit to define the image size. In our case, we have selected **pixels** (Fig.G-1.22).
6. *Set* the width and height of the image from the **Width** and **Height** spin boxes, respectively. In our case, we have set the width as **768** and the height as **480** (Fig.G-1.23).
7. *Click* the down-arrow in the spin box beside the Y resolution spin box (Fig.G-1.23).

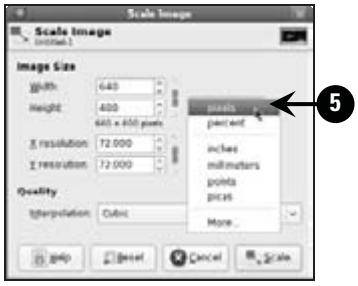


Fig.G-1.22

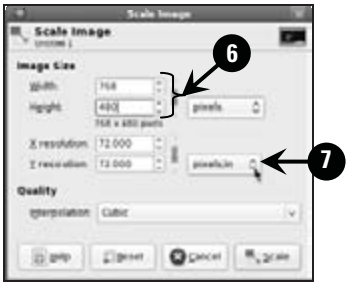


Fig.G-1.23

A drop-down list appears (Fig.G-1.24).

8. *Select* a unit for resolution from the drop-down list. In our case, we have used the default option, **pixels/in** (Fig.G-1.24).

9. *Set* the values for the image resolution from the **X resolution** and **Y resolution** spin boxes, respectively (Fig.G-1.25).
10. *Click* the **Scale** button (Fig.G-1.25).

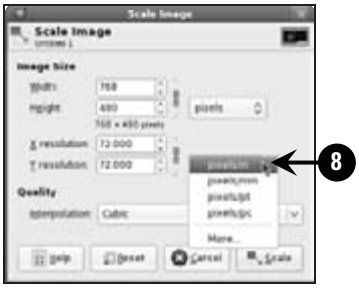


Fig.G-1.24

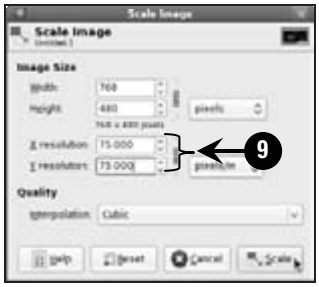


Fig.G-1.25

The size of the image changes according to the specifications set by you, as shown in Fig.G-1.26:



Fig.G-1.26

Next, let's learn to rotate an image.

Rotating an Image

Rotation is a process by which you change the position of an object by an angle. Rotation is most commonly used to improve the visual appearance of an image. You can rotate an image by 90 degrees in the clockwise or anticlockwise directions, or by 180 degrees.

Perform the following steps to rotate an image:

1. *Open* the image you want to rotate. In our case, we are using the image from the proceeding section (Fig.G-1.26).
2. *Click* the **Image** menu from the Menu bar (Fig.G-1.27). A drop-down menu appears (Fig.G-1.27).
3. *Place* the mouse pointer on the **Transform** option (Fig.G-1.27). A submenu appears (Fig.G-1.27).
4. *Select* a rotation option from the submenu. In our case, we have selected **Rotate180°**, as shown in Fig.G-1.27:

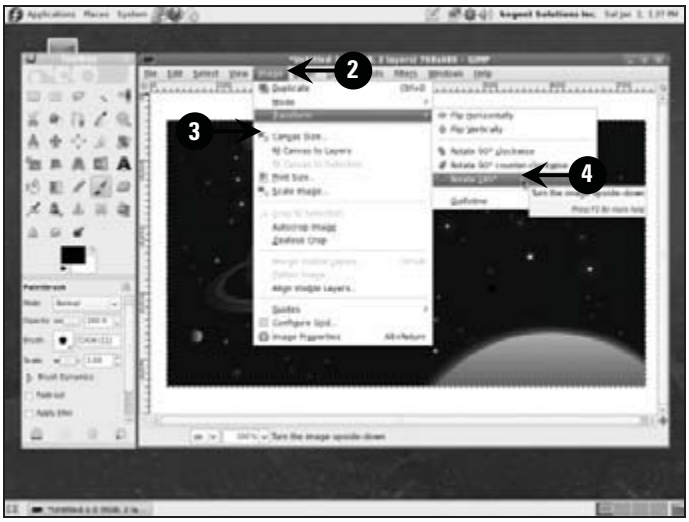


Fig.G-1.27

The image, after rotating 180 degrees, appears, as shown in Fig.G-1.28:



Fig.G-1.28

Now, let's learn to undo the changes made on an image in GIMP.

Undoing Changes in an Image

You may sometimes need to cancel or undo the changes you made in an image. In GIMP, you can do this by using the Undo option available in the Edit menu. In the following steps, we show you how to undo the rotation operation we performed in the image from the preceding section (Fig.G-1.28).

Perform the following steps to undo the changes made in an image in GIMP:

1. *Click* the **Edit** menu (Fig.G-1.29). A drop-down menu appears (Fig.G-1.29).
2. *Select* the **Undo Rotate image** option from the drop-down menu, as shown in Fig.G-1.29:

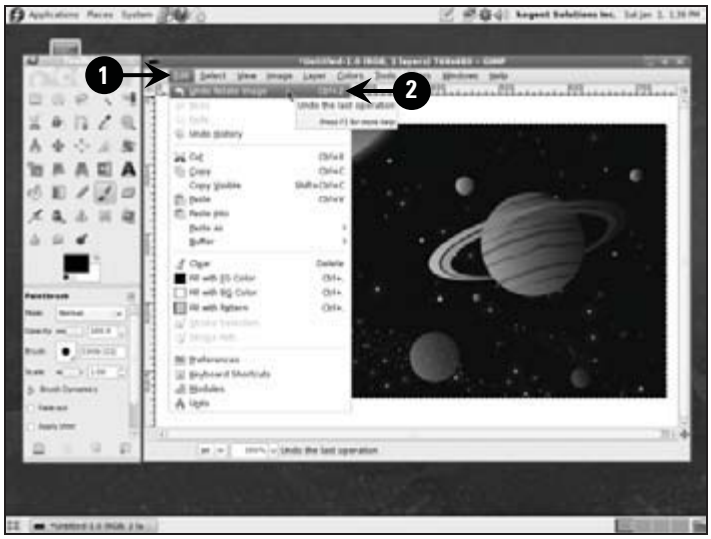


Fig.G-1.29

The rotate operation we performed on the image in the preceding section is undone and the image reverts to the state before the rotation was applied to it, as shown in Fig.G-1.30:



Fig.G-1.30

After learning to undo the last change made on an image in GIMP, let's discuss another important feature of an image, that is color, and learn how to work with it in GIMP.

Working with Colors

Color is the most important part of an image. A judicious use of colors can render beauty and elegance to images. GIMP provides you various tools to work with colors. For example, you can use Bucket Fill Tool from the Toolbox to fill a selected portion of an image. You can also set the background and foreground colors of an image. Before we begin to work with colors in GIMP, it is important to first understand the concept of color modes.

In the following sections, you learn about colors and color modes in detail. In addition, you learn to select and apply the foreground and background colors to an image in GIMP.

Let's begin by discussing color modes.

Exploring Color Modes

A color mode is a type of model used to create color of an image. In a color mode, the color of each pixel of the image is defined as a combination of the primary colors of that mode in different proportions. For example, the Title bar of the image window in Fig.G-1.30 displays the term RGB. This means that the image is in the Red-Green-Blue or RGB color mode. In other words, the color of each pixel of the image is a combination of the red, green and blue colors in different ratios. The color modes supported by GIMP are RGB, Cyan, Magenta, Yellow and Black (CMYK), Indexed. In addition to the preceding color modes, there are two more categories of color modes: Hue Saturation Volume (HSV) and Grayscale.

Let's now discuss the different color modes in detail, one by one.

The RGB Mode

Images in the RGB mode are defined as a combination of the red, green and blue colors, where the value of each pixel can range from 0 to 255. For example, if the light purple color is applied to a pixel in an image, the RGB values of that pixel is 242 for red, 200 for green, and 253 for blue. When the values of the three components or colors are equal, the result is a shade of neutral gray, and when it is 255 for all three, the result is pure white. If the value is 0 for all three, the result is black color.

The CMYK Mode

CMYK is another important color mode of GIMP. In this mode, the color of each pixel is a combination of the cyan, magenta, yellow and black colors. After an image is edited and ready to be printed, it is always better to convert it into the CMYK mode because this mode is printer-friendly. When an image is converted from the RGB mode CMYK mode, any color that is outside the range of CMYK is adjusted by GIMP to its nearest printable color. If you print an image without converting it into the CMYK mode, the colors outside the CMYK range are not printed properly, which may result in a low-quality print.

The Indexed Mode

The Indexed mode is usually used for multimedia and Web images. It uses 256 or fewer colors to describe an image. Indexed image files contain less data and therefore less memory is required to store these images. If you are designing graphics for the Internet, you should remember that many monitors cannot display 24-bit color that is 224=16777216 different colors. Many users use monitors that are limited to 256 colors. Therefore, an image consisting of numerous colors is indexed to a measly 256 colors when it is reproduced on their monitors. The images may not look very good, and take the same amount of time to download.



A 24-bit color image format is a format that uses 24-bits to define the color of each pixel of the image.

Let's now learn HSV, and Grayscale modes.

The HSV Mode

The HSV mode comprises three components: Hue, Saturation and Value. The following is a brief description of these components:

- **Hue**: Represents colors in their purest form, measured in degrees.
- **Saturation**: Refers to the purity of a color. The range of this component is from 0 (Grayscale) to 100 (maximum purity). A low saturation value provides a neutral, dull color and a high value indicates a pure color.
- **Value**: Represents the brightness of a pixel. A value of 0 indicates a completely black color while 100 is the highest value of brightness a color can have. The maximum value does not mean white (unless

saturation is zero); rather, it is simply the highest value of brightness a color can have at a particular degree of saturation.

The Grayscale Mode

Grayscale images are in a black-and-white form. Each pixel in the Grayscale mode is represented as a shade of gray. If you are printing an image in a black-and-white printer, it is better to convert the image to the Grayscale mode because doing so considerably reduces the size of the image file, which, in turn, helps to print the image quickly.

Let's now learn how to set the foreground and background colors of an image in GIMP.

Setting Foreground and Background Colors

The bottom portion of the Toolbox is associated with colors. It displays the Foreground and the Background color boxes. The default background color is white, that is, every time you open a new, blank file, the file opens with a white background. The default foreground color is black, that is, if you draw a color stroke on an image without setting a color in the foreground color box, then the stroke is drawn in black color. However, you can easily change the background and foreground colors according to your requirements.

Perform the following steps to set the foreground and background colors of an image in GIMP:

1. *Open* an image. In our case, we are using the image we opened in the preceding section (Fig.G-1.30)
2. *Click* the Foreground color box from the Toolbox window, as shown in Fig.G-1.31:

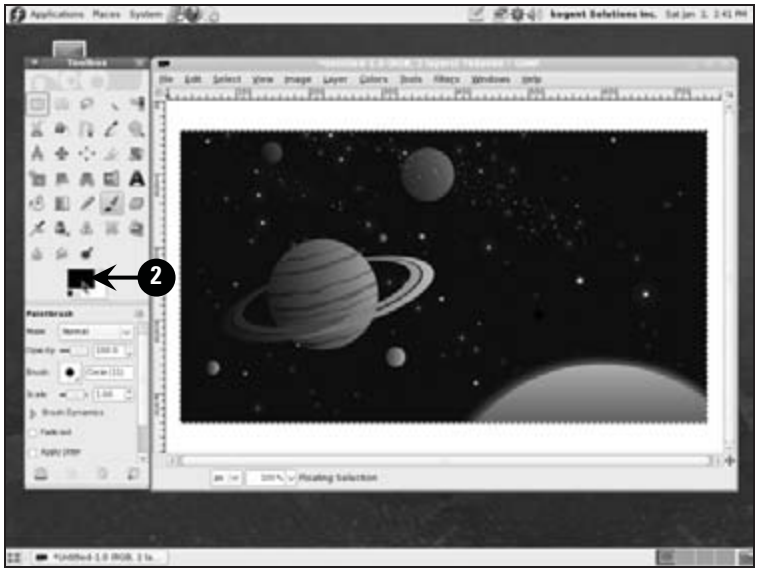


Fig.G-1.31

The **Change Foreground Color** dialog box appears, containing a color box and a vertical color spectrum bar beside it (Fig.G-1.32).

3. *Select* a shade from the vertical color spectrum bar. In our case, we select the Blue shade. A thin horizontal line appears on the point you click on the spectrum bar (Fig.G-1.32). The color box beside the spectrum bar now displays different shades of the selected Blue shade.
4. *Click* the required color from the color box. A horizontal line and a vertical line intersect at the point you click on the color box, showing the values of the selected color (Fig.G-1.33).

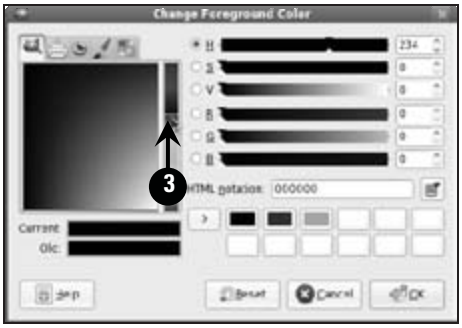


Fig.G-1.32

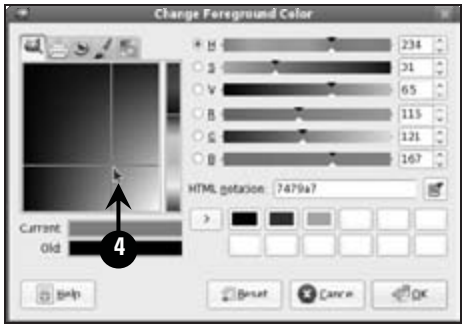


Fig.G-1.33

The Change Foreground Color dialog box closes (Fig.G-1.33) and the Foreground Color box in the GIMP window now displays the selected color as the foreground color of the image, as shown in Fig.G-1.34:



Fig.G-1.34



Similarly, you can also set the background color by using the Change Background Color dialog box. To do this, you have to click the Background color box. The Change Background Color dialog box appears. Now, select a color and click the OK button. The selected color becomes the background color of the current image.

After learning about how to set the foreground and background colors, lets now learn to capture image in GIMP.

Capturing Pictures by Using GIMP

While preparing a document, you may need to add images to the document in addition to the text. This helps to increase the understandability of the document for its readers. One way of using an image is to capture the image by using the appropriate tools. GIMP includes several image-capturing features. Using GIMP, you can capture a single window, a selected region of an image opened in a window, or the entire.

Let's start by capturing an entire screen.

Capturing an Entire Screen

As already discussed, you can capture an entire screen by using GIMP. Before you do that, however, you need to open an application or program whose screenshot want to capture. Suppose you want to capture the interface of a game, say Chess, along with the desktop. To do this, you first need to open this game.

Perform the following steps to open the Chess application:

1. *Select* **Applications→Games→Chess**, as shown in Fig.G-1.35:

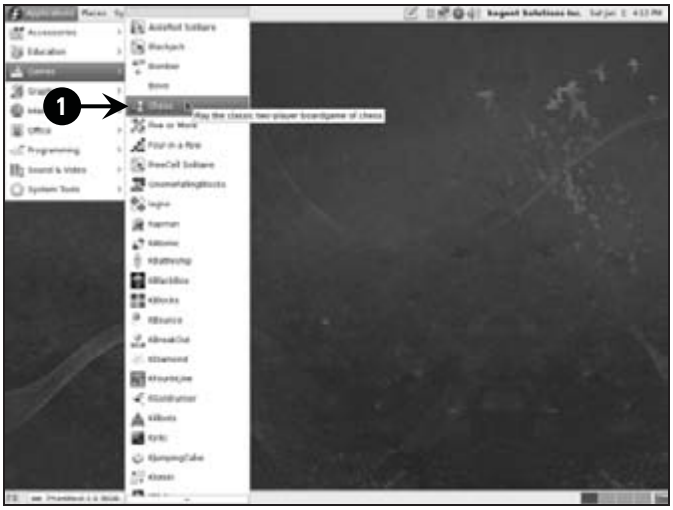


Fig.G-1.35

The window of the Chess application opens on the GNOME desktop, as shown in Fig.G-1.36:



Fig.G-1.36

Suppose you want to capture the Chess window along with the desktop. For this, proceed to the next step.

2. *Open* GIMP (Fig.G-1.37).
3. *Select* **File→Create→Screenshot** from the image window of GIMP, as shown in Fig.G-1.37:

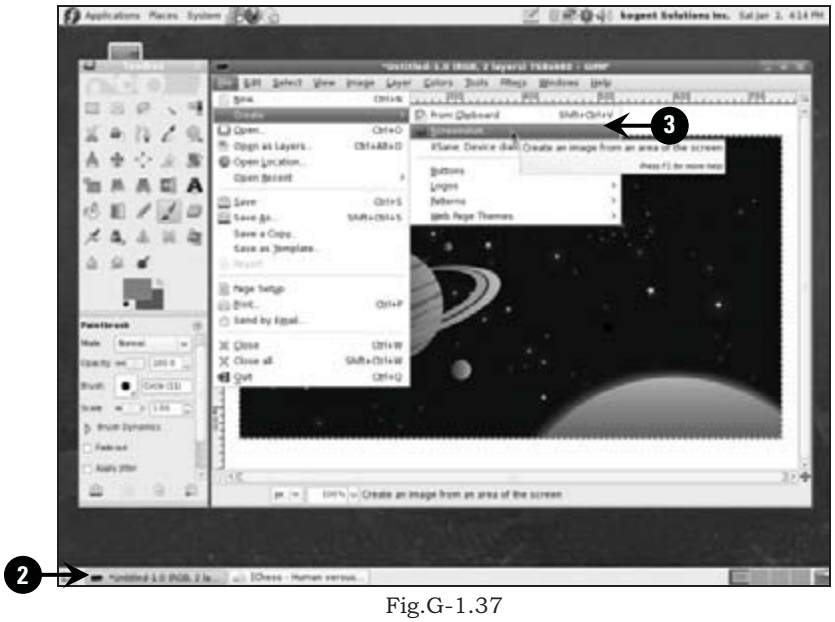


Fig.G-1.37

The **Screenshot** dialog box appears (Fig.G-1.38).

4. *Select* the **Take a screenshot of the entire screen** radio button to grab the whole screen (Fig.G-1.38).
5. *Select* the **Include mouse pointer** check box if you want to show mouse pointer on the screenshot. In our case, we have left this check box without selected (Fig.G-1.38).
6. *Set* the delay time in the **Delay** spin box. In our case, we have set it as **4** (Fig.G-1.38).



You need to set the delay time so that you get enough time to select the screen you want to capture.

7. *Click* the **Snap** button, as shown in Fig.G-1.38:

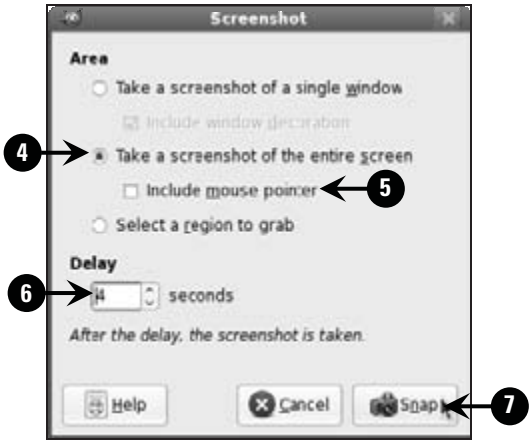


Fig.G-1.38

After a delay of 4 seconds, the grab of the desktop screen is captured (Fig.G-1.39).

8. *Click* the **File** menu (Fig.G-1.40). A drop-down menu appears (Fig.G-1.40).
9. *Select* the **Save As** option from the drop-down menu (Fig.G-1.40).



Fig.G-1.39



Fig.G-1.40

The **Save As** dialog box appears (Fig.G-1.41).

10. *Select* the location to save screenshot. In our case, we have selected the **Documents** folder (Fig.G-1.41).
11. *Type* the name of the screenshot in **Name** text box (Fig.G-1.41). In our case, we have typed the name **Snap-1.**
12. *Click* the **Save** button (Fig.G-1.41).
    The captured image is saved and Title bar shows the new name of the captures image (Fig.G-1.42).
13. *Click* the **Close** button from the Title bar of the Snap-1 window to close the window (Fig.G-1.42).

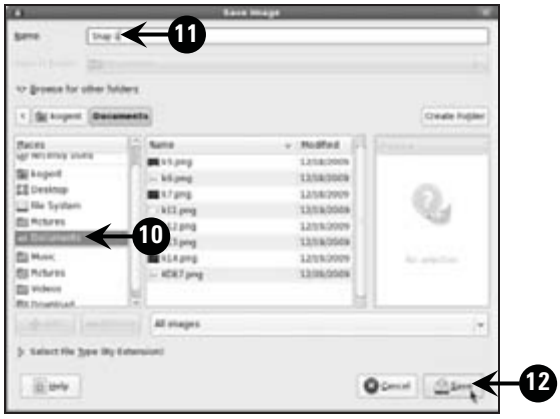


Fig.G-1.41



Fig.G-1.42

You return to the desktop with the Chess window open (Fig.G-1.36).

Let's now learn to capture an active window.

Capturing an Active Window

In the preceding section, you learn to capture the whole screen. However, if you want to capture a single window instead of the entire screen, you need to select the take a screenshot of a single window option in the Screenshot dialog box.

Perform the following steps to capture a single window in GIMP:

1. *Open* two or more windows and select one window to make it active. In our case, we have opened the Movie Player and the Chess windows, and made the Chess window active, as shown in Fig.G-1.43:



Fig.G-1.43

2. *Open* the GIMP program and *select* **File→Screenshot,** as shown in Fig.G-1.44:

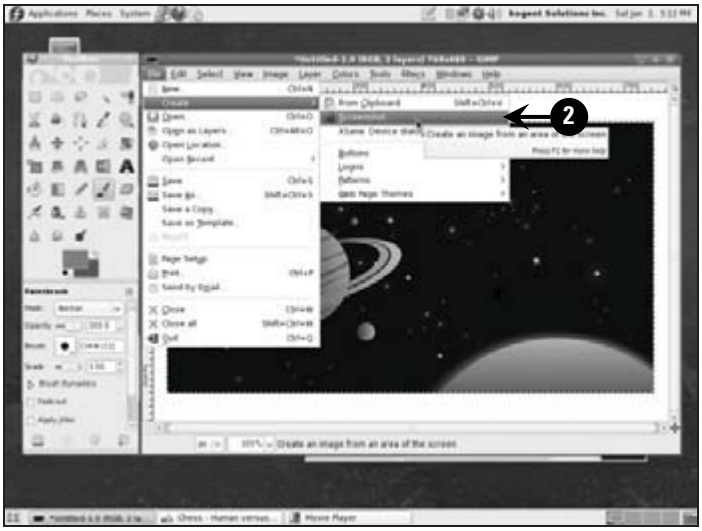


Fig.G-1.44

The **Screenshot** dialog box appears (Fig.G-1.45).

3. *Select* the Take a screenshot of a single window radio button.
4. *Select* the **Include window decoration** check box to include the Title bar and the blue frame around the image in the screenshot (Fig.G-1.45).
5. *Set* the time delay to take screenshot, from the **Delay** spin box. In our case, the delay is of 4 seconds (Fig.G-1.45).
6. *Click* the **Snap** button (Fig.G-1.45).

   As soon as you click the Snap button, the GIMP program allows you take the screenshot of the active window.
7. *Click* the window whose screenshot you want to take. In our case, we have clicked the Chess window (Fig.G-1.46).

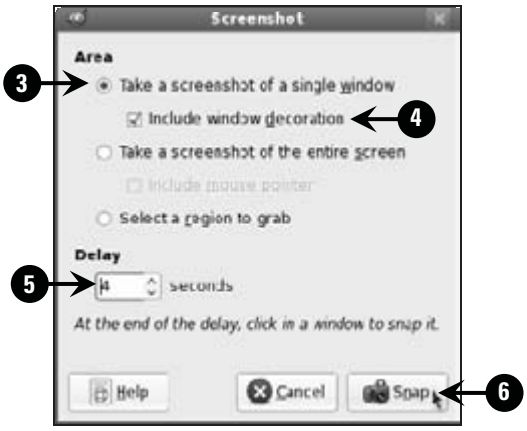


Fig.G-1.45

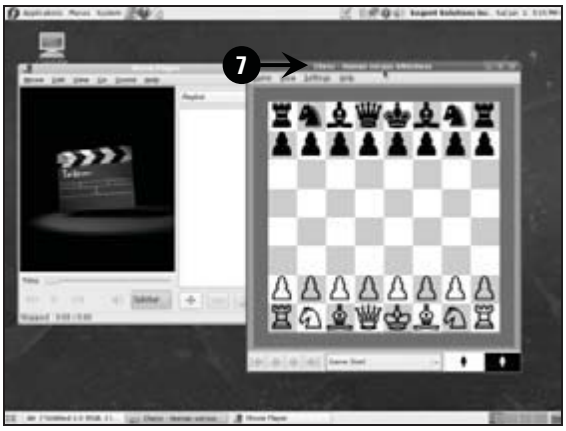


Fig.G-1.46

The screenshot of the **Chess** window appears (Fig.G-1.47).

8. *Click* the **File** menu from the Menu bar (Fig.G-1.48). A drop-down menu appears (Fig.G-1.48).
9. *Select* the **Save As** option from the drop-down menu (Fig.G-1.48).



Fig.G-1.47



Fig.G-1.48

The **Save Image** dialog box appears (Fig.G-1.49).

10. *Select* the location to save captured screenshot. In our case, we have selected the Documents folder (Fig.G-1.49).
11. *Type* the name of the captured screenshot in the **Name** text box (Fig.G-1.49). In our case, name of the file is Snab-2.
12. *Click* the **Save** button (Fig.G-1.49).

    The screenshot is saved with the given name in the selected location.
13. *Click* the **Close** button to close the Snab-2 window (Fig.G-1.50).

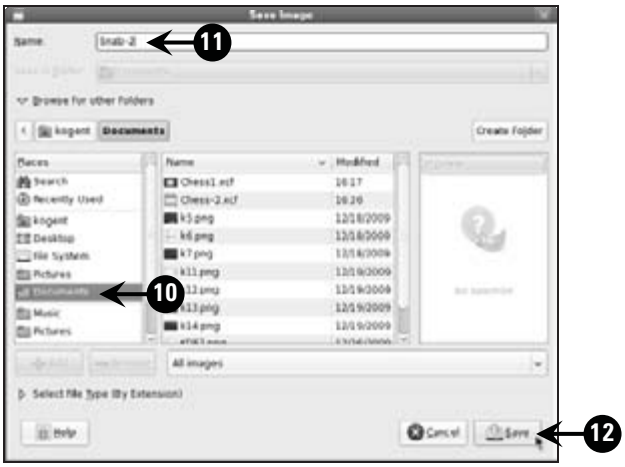


Fig.G-1.49



Fig.G-1.50

14. *Close* all the windows except the image window by clicking their respective Close buttons on the Title bar, as shown in Fig.G-1.51:



Fig.G-1.51

Let's now learn to save the image that is open in the GIMP window.

Saving a File

After working on an image and making the required changes to it, you need to save the image as a file so that the changes are saved and you are able open and use the image whenever required.

Perform the following steps to save a file:

1. *Click* the panel button for the GIMP window you want to save, to activate the window. In our case, we have activated the Untitled-1 GIMP window (Fig.G-1.52).
2. *Select* the **File** menu from the image window. A drop-down menu appears (Fig.G-1.52).
3. *Select* the **Save As** option from the drop-down menu, as shown in Fig.G-1.52:

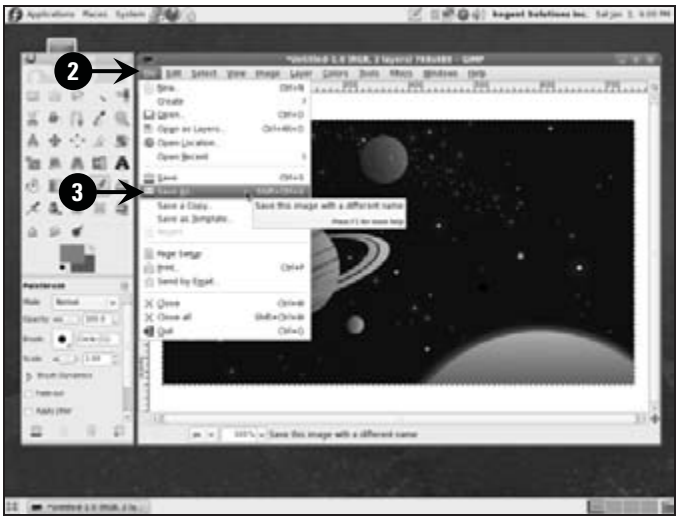


Fig.G-1.52

The **Save Image** dialog box appears (Fig.G-1.53).

4. *Select* the location where you want to save the image file. In our case, we have selected the **Pictures** folder.
5. *Type* the name of the image file in the **Name** text box. In our case, we have named it **Pluto** (Fig.G-1.53)**.**
6. *Click* the **Save** button (Fig.G-1.53).

   The image is saves in the selected location. The new name of the image appears on the Title bar of the image window (Fig.G-1.54).

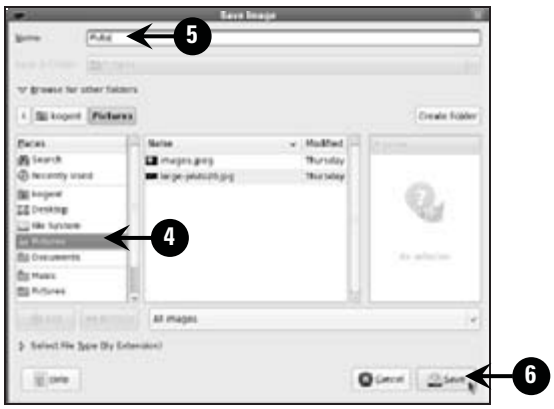


Fig.G-1.53



Fig.G-1.54

After saving the image file, let's now learn to close the file and quit the GIMP program.

Closing a File and Quitting GIMP

After working on an image file and performing all the tasks in the GIMP application, you can close the file and quit the program.

Perform the following steps to close a file and quit the GIMP program:

1. *Click* the **File** menu from the Menu bar of the image window that you want to close (Fig.G-1.55). A drop-down menu appears (Fig.G-1.55).

2. *Click* the **Close** option from the drop-down menu, as shown in Fig.G-1.55:

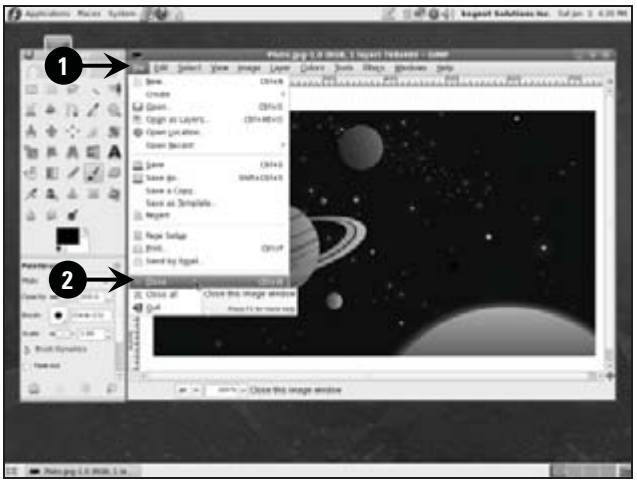


Fig.G-1.55

The image window closes (Fig.G-1.56).

3. *Select* the **File** menu (Fig.G-1.54). A drop-down menu appears (Fig.G-1.56).
4. *Select* the **Quit** option from the drop-down menu, as shown in Fig.G-1.56:

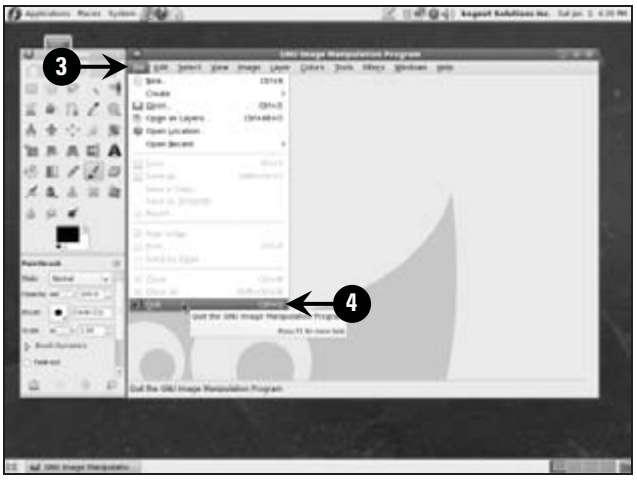


Fig.G-1.56

You exit from GIMP and return to the desktop screen.

With this we come to the end of this chapter. Before proceeding to the next chapter, let's summarize the main points of this chapter.

Summary

This chapter has discussed the GIMP program in detail. It has explored the different components of the GIMP interface. You have also learned to perform simple tasks in GIMP such as opening, copying, and editing images. In addition, the chapter has explained the various colors modes. Moreover, you have learned to set the foreground and background colors as well as capture pictures. In the end, the chapter has shown you how to save and close an image file, and quit the GIMP program.

CHAPTER

2

Working with Tools

In this Chapter:

- Working with the Selection Tools
- Working with a Selection
- Working with Painting Tools
- Working with Editing Tools
- Transforming Images
- Quitting GIMP

Whether you are working with a photo album or an art, you need an image manipulation program. Such programs allow you to work with images in different ways. For example, you can rotate an image by a specified angle or increase or decrease the size of the image. All these activities are performed by using different tools.

The popularity of a program depends on how interactive it is, that is, how easily users are able to access the different features of the program. GNU Image Manipulation Program (GIMP) provides a very user-friendly interface that allows users to work with images easily in a variety of ways by using different tools. For example, you can choose to select the whole image or a part of the image and work on it. The tools are categorized according to the functions they perform. For example Selection tools such as Rectangle Select Tool and Ellipse Select Tool are used to work on a selected part of an image, whereas the Painting tools, the Editing tools, and the Transform tools are used to paint, edit, and transform images respectively. All the tools are located in the Toolbox of the GIMP interface.

This chapter discusses the different tools of GIMP. It begins by the Selection tools, where you also learn to select a part of an image, and move, edit as well as fill the selection. You also learn to use the various Painting tools, such as Paintbrush Tool and Pencil Tool and Editing tools such as Blur/Sharpen Tool and Smudge Tool. You also learn about the Transform tools, such as Alignment Tool and Move Tool. The chapter concludes by showing you how to quit the GIMP program.

Let's begin by learning about the Selection tools of GIMP.

Working with the Selection Tools

One of the most common tasks while working with images in a graphics program is making selections. Often, instead of working in an image as a whole, you may need to work on certain portions of the image. GIMP provides various tools that enable you to select portions of an image. The Selection tools of GIMP are as follows:

- **Rectangle Select Tool:** Allows you to make a rectangular selection in an image
- **Ellipse Select Tool:** Allows you to make an elliptical selection in an image
- **Free Select Tool:** Allows a free-hand selection in an image
- **Foreground Select Tool:** Allows you to select a foreground object in an image
- **Fuzzy Select Tool:** Allows you to select adjacent areas of the same color in an image
- **Select by Color Tool:** Allows you to select objects of the same color in an image
- **Intelligent Scissors Tool:** Allows you to select a region with well-defined color objects, at the edges

Let's now discuss some of these Selection tools and learn how to use them as well in the following sections.

Using Rectangle Select Tool

Rectangle Select Tool helps you to make rectangular selections in an image. When you drag the mouse using this tool on an image, a dashed border appears in the shape of a rectangle around the area. As you release the mouse button, the dashed lines of the rectangle start moving, indicating that the area inside the rectangle is selected. This rectangle with the moving dashed lines is known as a selection marquee. Whatever changes you now make to the image are applied to this selected portion only.

Perform the following steps to open GIMP and use Rectangle Select Tool:

1. *Select* **Applications→Graphics→GNU Image Manipulation Program** (Fig.G-2.1).
   The **GNU Image Manipulation Program** window appears (Fig.G-2.2).
2. *Select* **File→Open** (Fig.G-2.2).

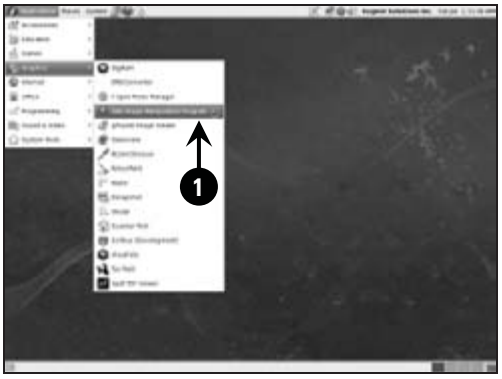


Fig.G-2.1



Fig.G-2.2

The **Open Image** dialog box appears (Fig.G-2.3).

3. *Select* a location where you have saved images. In our case, we select the **Pictures** folder (Fig.G-2.3). The content of the folder is displayed in the Display area of the **Open Image** dialog box.
4. *Select* an image from the middle pane. In our case, we have selected **Dear.JPG** (Fig.G-2.3).
5. *Click* the **Open** button (Fig.G-2.3).

   The selected image opens in an image window (Fig.G-2.4).

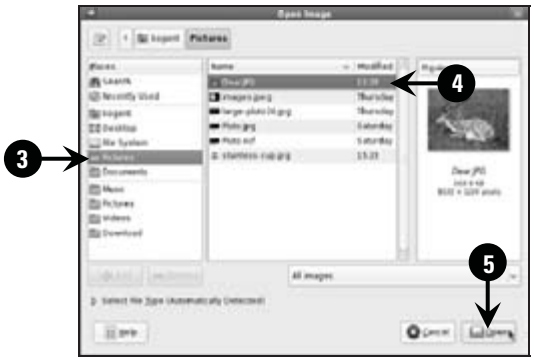


Fig.G-2.3



Fig.G-2.4

6. *Select* **Rectangle Select Tool** from the Toolbox (Fig.G-2.5).
7. *Move* the mouse pointer to the location of the image from where you want to make a selection. *Drag* the mouse pointer to define the boundary around the area to be selected (Fig.G-2.6) and *release* the mouse button.

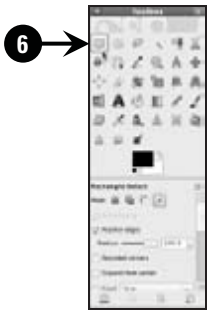


Fig.G-2.5



Fig.G-2.6

As soon as you release the mouse button, the selection boundary is converted to moving dashed lines. The area inside the dashed line is currently selected, so whatever changes you make would apply to this portion of the image only.



To make a square selection, press the SHIFT key on the keyboard, and, keeping the key pressed, drag the mouse pointer to define the boundary to be selected by using Rectangle Select Tool. This allows the selection to be of equal width and height.

8. *Click* the mouse pointer anywhere on the image outside the selection boundary. The selection canceled, as shown in Fig.G-2.7:



Fig.G-2.7



The Tool Options window (Fig.G-2.5) opens by default when you open GIMP for the first time in your system after the installation of the program. As you know, the Tool Options window displays the name and options of the selected tool. As we are currently working with Rectangle Select Tool, the Tool Options window displays the name and options of Rectangle Select Tool. Though these options are different for different tools, there are some common options as well, such as:

- **Mode: Provides four categories of modes: Replace, Add, Subtract, and Intersect. The Replace mode replaces an existing selection with a new one. The Add mode adds a new selection to an existing selection. The Subtract mode removes the new selection from an existing selection, and the Intersect mode creates a selection that overlaps the region of the new selection and the existing selection.**
- **Feather edge: Creates soft-feathered edges around a selection. An image is made of a number of pixels. These pixels are arranged in the form of plates or layers.**

When you make a normal selection in an image, all the layers of pixels are selected. However, if you make a selection by using the Feather edge option, all layers of the selection is not selected. The number of layers selected depends on the value you set for the Feather edge option. In other words, the greater the value of the Feather edge option, the fewer will be the number of selected layers. It is similar to cutting a piece of cake, but taking out only the icing (some layers), while leaving the base (other layers) of the cake unaltered.

- **Radius: Determines the extent of feather. A greater value of radius corresponds to a fewer number of selected layer pixels. The slider beside the Radius option is used to increase or decrease the value of Radius. The Radius option is disabled by default; it is enabled only when the Feather check box is selected.**
- **Aspect ratio: Refers to the option used to specify the width and height values for a rectangular selection. If you select this option, you cannot form a free-size rectangular selection. Each time an image is clicked with Rectangular Selection Tool selected, a rectangular selection of the width and height specified in the Aspect ratio option is**

created at the point you have clicked. Using this option, you can also make square selections by specifying the same values for the width and height.

- **Width: Refers to the option to specify width of a rectangular selection.**
- **Height: Refers to the option to specify the height of the rectangular selection.**
- **Size: Refers to the option that define the size of selection.**

Let's now learn about Free Select Tool.

Using Free Select Tool

Rectangle Select Tool and Ellipse Select Tool are used to make fixed-shaped selections. Therefore, when you use these tools, the selections are made in a defined shape. However, sometimes you may need to make free-hand selections in an image. GIMP provides Free Select Tool to do this. Using this tool, you can make selections of any shape.

Perform the following steps to make a free-hand selection:

1. *Open* the image on which you have to make the selection (Fig.G-2.8).
2. *Click* the image to make it active and *select* **Free Select Tool** from the Toolbox (Fig.G-2.9).

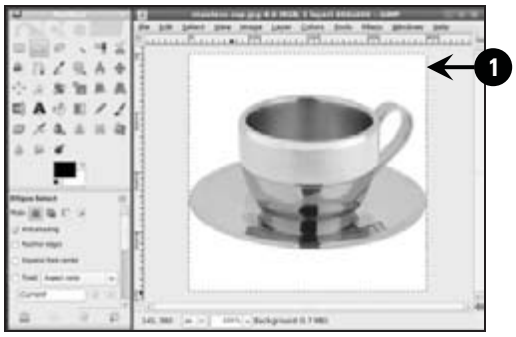


Fig.G-2.8



Fig.G-2.9

3. *Position* the mouse pointer on the image from where you want to the selection and *drag* the mouse pointer to draw a boundary of the area to be selected (Fig.G-2.10). *Release* the mouse button when the desired boundary is created. The selection is made (Fig.G-2.10).
4. *Right-click* the mouse pointer anywhere on the image, to remove the selection. A context menu appears (Fig.G-2.11).
5. *Select* the **Select** option. A submenu appears (Fig.G-2.11).
6. *Select* the **None** option from the submenu (Fig.G-2.11).

   The selection is canceled (Fig.G-2.12).



Fig.G-2.10

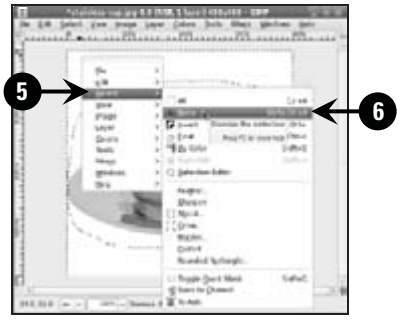


Fig.G-2.11



Fig.G-2.12

Let's now learn about Fuzzy Select Tool.

Using Fuzzy Select Tool

Fuzzy Select Tool is used to select adjacent areas of the same color in an image. The selection depends on the value of the Threshold option in the Tool Options window of Fuzzy Selection Tool. The default Threshold value is 15.0. This value decides the extent of pixels in the selected portion of the image. A low value signifies that only pixels that are of the same color are selected, while a high value means that all the pixels of similar color shades are selected.

Perform the following steps to make a selection by using this Fuzzy Select Tool:

1. *Open* the image in which you want to make as selection by using Fuzzy Select Tool. In our case, we are using the image of the proceeding section (Fig.G-2.12), as shown in Fig.G-2.13.
2. *Select* **Fuzzy Select Tool** from the Toolbox (Fig.G-2.14).
3. *Click* the up arrow in the **Threshold** spin box to increase the threshold value to **45** (Fig.G-2.15).

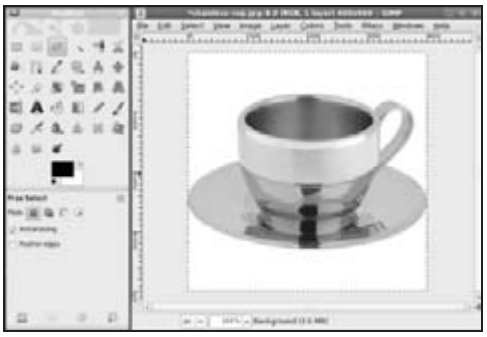


Fig.G-2.13



Fig.G-2.14



Fig.G-2.15

4. *Move* the mouse pointer to the area of the image where you want to make the selection, and *click* (Fig.G-2.16).

   All pixels of the same color in the area you click are selected (Fig.G-2.17).
5. *Click* anywhere outside the image. The selection is canceled (Fig.G-2.18).



Fig.G-2.16



Fig.G-2.17



Fig.G-2.18

Let's now learn about Scissors Select Tool.

Using Scissors Select Tool

Scissors Select Tool is the one of the most efficient tools provided by GIMP to make selections. This tool is useful when you want to select a region defined by well-defined colors at the edges. It is easier to use this tool than the other Selection tools because when you drag the mouse pointer on an image with Scissors Select Tool, the tool detects the edges in the image and adds control nodes (also called control points or anchors) along the path you click, thereby making a selection. These control points are used to define the selection region.

Perform the following steps to make a selection by using Scissors Select Tool:

1. *Open* an image on which you want to use Intelligent Scissors Select Tool (Fig.G-2.19).
2. *Select* **Scissors Select Tool** from the Toolbox (Fig.G-2.20).



Fig.G-2.19



Fig.G-2.20

3. *Click* the point on the image from where you want to start the selection. A dot appears at the point you click (Fig.G-2.21).
4. *Move* the mouse pointer across the area to be included in the selection, and *click*. Another dot appears at this point, and a line joins the two dots, thereby forming the selection boundary (Fig.G-2.22).
5. *Click* along the selection boundary to create nodes or anchor points (Fig.G-2.23).



Fig.G-2.21



Fig.G-2.22



Fig.G-2.23

6. *Move* the mouse pointer to the starting point of your selection and *click* it to end the selection (Fig.G-2.24).

   This completes a region for selection (Fig.G-2.24).
7. *Move* the mouse pointer to any point inside the boundary and *click*. The curve is converted to a selection (Fig.G-2.25).



Fig.G-2.24



Fig.G-2.25

8. *Right-click* anywhere in the image window. A context menu appears (Fig.G-2.26).
9. *Select* the **Select** option from the context menu. A submenu appears (Fig.G-2.26).
10. *Select* the **None** option from the submenu (Fig.G-2.26).
    The selection is canceled from the image (Fig.G-2.27).

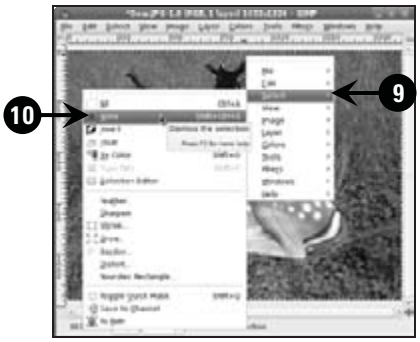


Fig.G-2.26



Fig.G-2.27

In the preceding sections, you learned to make selections on images by using various selection tools provided in GIMP. However, you did not learn how to use these selections. In the following section, therefore, you learn how to perform various tasks with these selections.

Working with a Selection

Instead of working on the whole image, you may sometime need to work on a selected portion of the image. With GIMP, you can to perform various tasks on a selection. For example, you can move the selected portion within an image or to another image or fill the selected portion of an image. In this section, you learn to move a selection portion, edit a selection, copy a selection, invert a selection, fill a selection, and erase a selection.

Let's begin by learning to move a selected portion.

Moving a Selected Portion

You can move selected portions of an image from one location to another. You can add the selected portion to any region of the image.

Perform the following steps to move a selection:

1. *Open* an image (Fig.G-2.28).
2. *Select* **Ellipse Select Tool** from the Toolbox (Fig.G-2.28).
3. *Drag* the mouse pointer to make a selection (Fig.G-2.28).
4. *Press* the **CTRL**+**ALT** keys and drag the selected portion to move it. The selected area is moved (Fig.G-2.29).

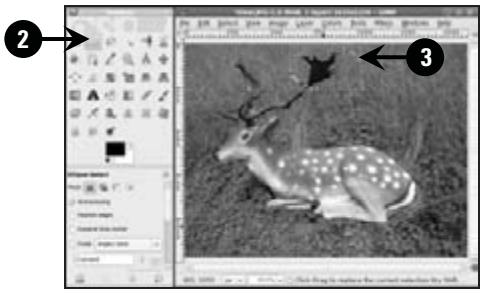


Fig.G-2.28



Fig.G-2.29

The portion from where you moved the pixels becomes empty and a white background of the area is visible (Fig.G-2.29).

5. *Close* the image window without saving the changes if you do not want to alter the original image.

Let's now learn how to edit a selection.

Editing a Selection

You can modify a selection in a variety of ways. After making a selection, if you want to either add a specific portion of an image to it or remove a portion from it, you can do so by using different techniques. In this section, you learn to add to a selection.

Perform the following steps to add some areas of an image to a selection:

1. *Open* an image (Fig.G-2.30).
2. *Select* **Ellipse Select Tool** from the Toolbox and make a selection in the image (Fig.G-2.31).

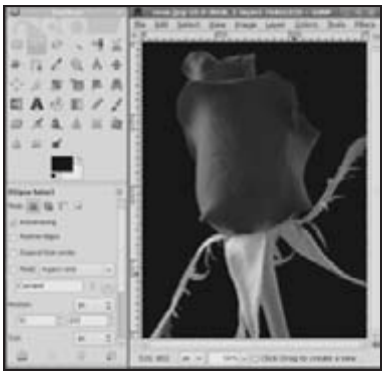


Fig.G-2.30

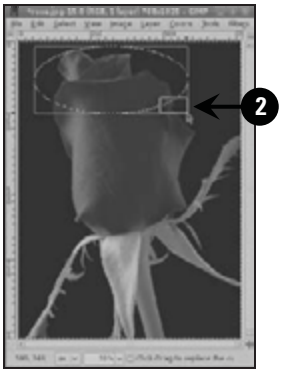


Fig.G-2.31

3. *Press* the **SHIFT** key and make another selection intersecting the previous selection (Fig.G-2.32).

   As soon as you release the mouse button, both selections merge, forming a single selection (Fig.G-2.33).

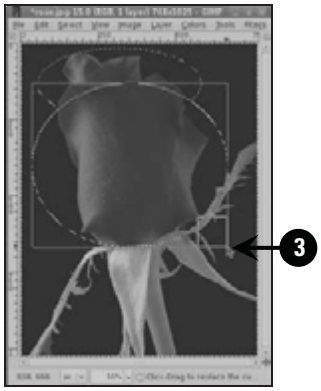


Fig.G-2.32



Fig.G-2.33

4. *Remove* the selection by clicking anywhere outside the selection (Fig.G-2.33).



Even if the selections you make with the help of the SHIFT key do not intersect and are in distant portions of the image, they are treated as one selection. If you move any one of these selections by a distance, the others also move by the same distance.

Let's now learn to copy a selection.

Copying a Selection

A selection of an image can be easily copied and pasted on the same image or on some other image. When you paste the selection, a copy of the selection is automatically created as a new layer over the original selection and you can move this layer on any part of an image.

Perform the following steps to copy and paste a selection:

1. *Select* a part of an image by using **Ellipse Select Tool** (Fig.G-2.34).
2. *Right-click* anywhere on the image. A context menu appears (Fig.G-2.35).
3. *Select* the **Edit** option from the context menu. A submenu appears (Fig.G-2.35).
4. *Select* the **Copy** option from the submenu (Fig.G-2.35).

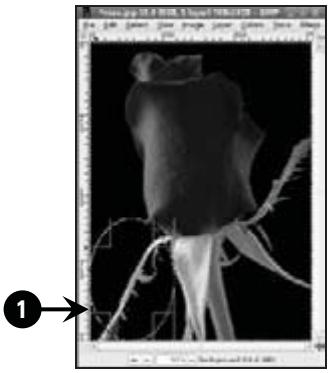


Fig.G-2.34

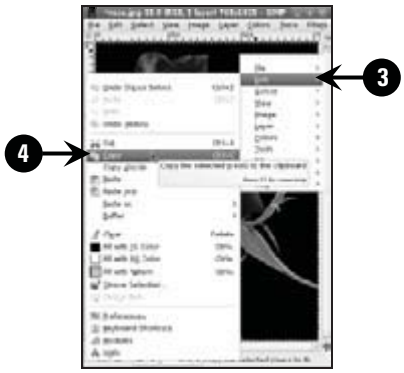


Fig.G-2.35

A copy of the selection is placed on the clipboard.

5. *Right-click* again anywhere on the image. A context menu appears (Fig.G-2.36).
6. *Select* the **Edit** from the context menu (Fig.G-2.35). A submenu appears (Fig.G-2.36).
7. *Select* the **Paste** option from the submenu (Fig.G-2.36).

   A copy of the selection is pasted exactly on the selection (Fig.G-2.37).
8. *Click* and *drag* the selection to move it.

   You see that as you move the selection, the originally selected area remains and a floating layer of the selected portion moves. The portion that moves is a copy of the original selection, as shown in Fig.G-3.38:

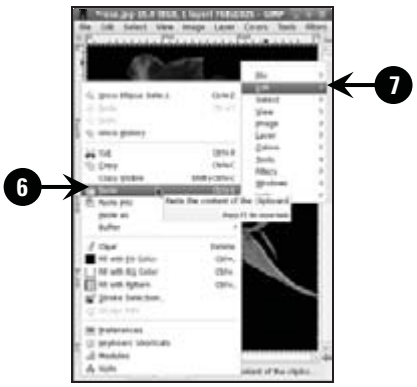


Fig.G-2.36



Fig.G-2.37

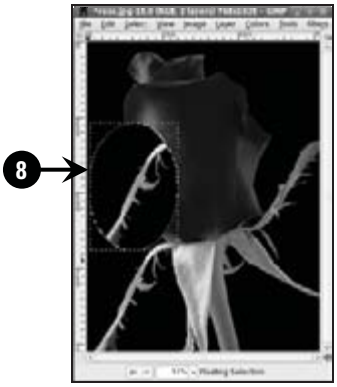


Fig.G-2.38

9. *Press* the **CTRL** + **Z** keys to undo the changes made in the image (Fig.G-2.38).

Let's now learn to invert a selection.

Inverting a Selection

When you invert a selection in an image, the entire image barring the selection is selected. For example, if you select a rectangular portion of an image and invert the selection, the entire image, except this rectangular portion, is selected. This technique is useful when you have to make selections that would otherwise be too difficult or tedious to make. Instead, you can simply select the other areas and invert the selection. In this way, you end up with the selection you want.

Perform the following steps to invert a selection in an image:

1. *Open* an image (Fig.G-2.39).
2. *Select* **Fuzzy Select Tool**, and make a selection (Fig.G-2.39).
3. *Right-click* anywhere on the image. A context menu appears (Fig.G-2.40).
4. *Select* the **Select** option from the context menu. A submenu appears (Fig.G-2.40).
5. *Select* the **Invert** option from the submenu (Fig.G-2.40).

   The entire image, except the area of the selection, is selected (Fig.G-2.41).

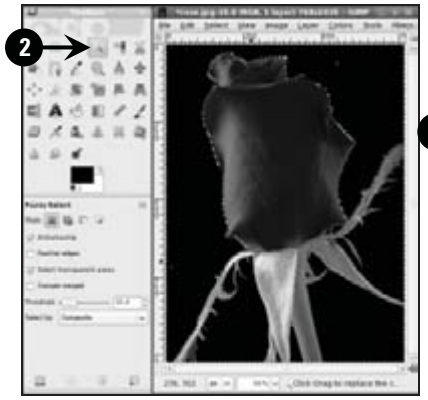


Fig.G-2.39

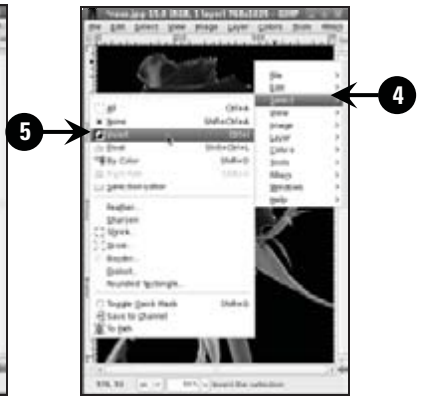


Fig.G-2.40



Fig.G-2.41

Let's now learn how to erase a selection.

Erasing a Selection

In GIMP, Eraser Tool is used to erase pixels from an image. Now, let's use this tool on the image of the preceding section (Fig.G-2.41) and erase the inverted portion of the image.

Perform the following steps to use Eraser Tool:

1. *Open* an image (Fig.G-2.42).
2. *Select* **Eraser Tool** from the Toolbox, as shown in Fig.G-2.42:

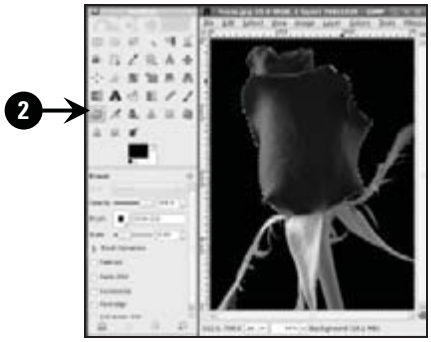


Fig.G-2.42

3. *Click* the small arrow in the lower right corner of the **Brush** icon on the Tool Options window. A list of brush category appears (Fig.G-2.43).
4. *Select* the brush type from the list. In our case, we have selected the **Cloth** brush type (Fig.G-2.43).
5. *Drag* the **Scale** slider to the right to increase the size of the selected brush. In our case, the scale value is **0.82** (Fig.G-2.44).
6. *Drag* the mouse pointer on the image to erase the selection. Note that the pixels are deleted wherever you drag Eraser Tool in the image, except for the area on which you had made a fuzzy selection, even when you drag over this area (Fig.G-2.45).

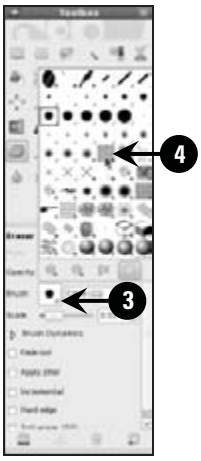


Fig.G-2.43

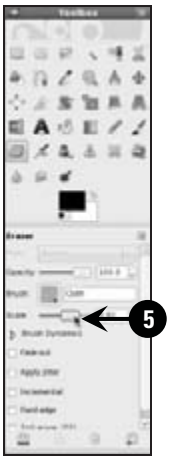


Fig.G-2.44

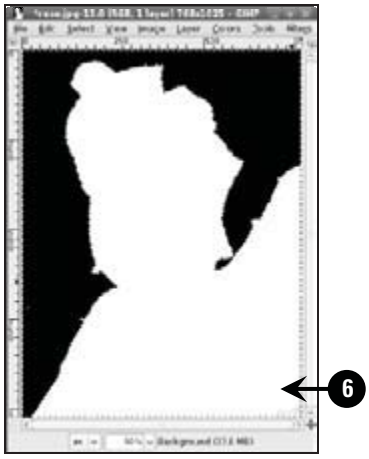


Fig.G-2.45

7. *Click* the **Close** button to close the image.

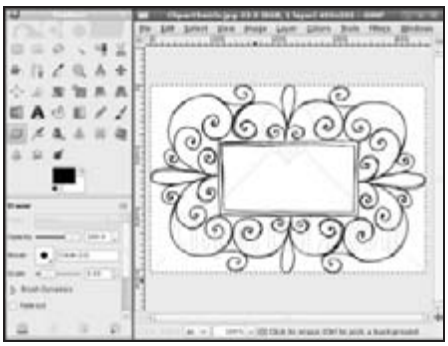
Let's now learn to fill a selection.

Filling a Selection

In GIMP, you can fill an image with a color of your choice in a variety of ways, be it a selected area of an image, the whole image, or a selection from some other image. You can also fill an image selection with patterns or designs.

Perform the following steps to fill a selection with a pattern:

1. *Open* an image (Fig.G-2.46).
2. *Make* a selection (Fig.G-2.47).


Fig.G-2.46

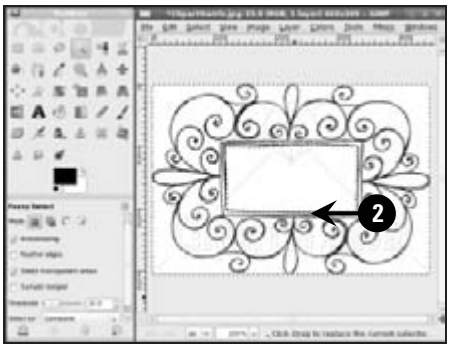


Fig.G-2.47

3. *Select* **Bucket Fill Tool** from the Toolbox (Fig.G-2.48).
4. *Select* the type of fill you want under the **Fill Type (Ctrl**) option. In our case, the fill type is **Pattern fill** (Fig.G-2.48).
5. *Click* the **Pattern fill** icon to select a pattern (Fig.G-2.48).
   A list of patters appears (Fig.G-2.49).
6. *Select* a pattern from the list. In our case, we have selected **Orange Brown Stuff** (Fig.G-2.49).



Fig.G-2.48

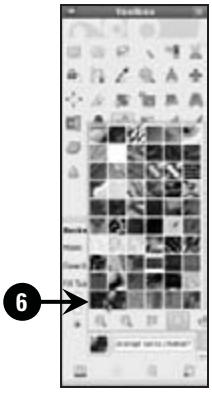


Fig.G-2.49

7. Now *move* the mouse pointer anywhere inside the selection, and *click* (Fig.G-2.50).
   The selection is filled with the selected pattern (Fig.G-2.51).

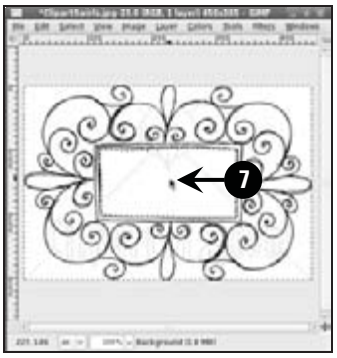


Fig.G-2.50

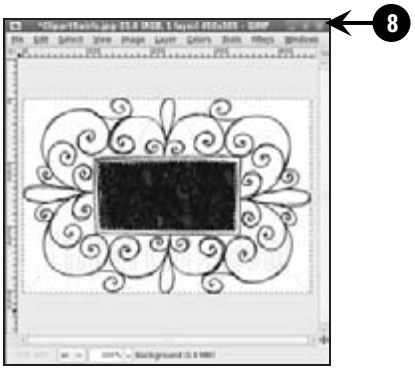


Fig.G-2.51

8. *Close* the image by *clicking* the **Close** button from the Title bar of the window (Fig.G-2.51).

After learning to work with different Selection tools in GIMP, let's now learn how to work with the Painting tools.

Working with Painting Tools

Painting tools are used to paint images and edit their color in a variety of ways. In GIMP, all Painting tools share the same brushes and the same options for selecting colors. These tools help you to paint the image with a wide variety of modes. GIMP provides the following Painting tools:

- **Paintbrush Tool:** Refers to the tool used to apply color with brush strokes
- **Pencil Tool:** Refers to the tool used to create a painting with hard edges
- **Airbrush Tool:** Refers to the tool used to create soft areas of color in a painting

Before starting to work with Painting tools, it is worthwhile to discuss the various options displayed in the Tool Options window when a Painting tool is selected. The Tool Options window displays some, or all, of the following options when a Painting tool is selected:

- **Opacity**: Determines the extent of transparency of a stroke you make with a Painting tool. A 100.0 value produces a completely opaque stroke. The lesser the value of opacity, the more transparent the stroke is.
- **Mode**: Provides a selection of paint application modes. The selected mode determines how a paint stroke will blend with the image pixels beneath it. For example, the Normal mode, which is the default mode, displays the stroke as it is without any changes being made to the color of an image, while the Multiply mode produces a stroke by multiplying the color of the pixels of the image with the selected color. Therefore, the stroke is generated with the resultant color, which is a mixture of the image color pixels with the currently selected color.
- **Fade out**: Refers to the option that allows you to draw strokes that fade out after a specified distance. The up-arrow and down-arrow buttons in the box beside this option are used to increase or decrease the value of the fade out. With small Fade Out values, the strokes fade out quickly.
- **Gradient:** Refers to the option used to draw strokes with the currently selected gradient instead of the currently selected Foreground color. The se**quence o**f colors in the gradient is rendered within the distance set. The up-arrow and down-arrow buttons of the box for this option are used to increase or decrease the frequency and size of the gradient in the stroke. .



Gradient refers to a set of colors with smooth transitions (in ascending or descending order) between the colors.

Let's now learn to use some of the Painting tools.

Using Paintbrush Tool

Using Paintbrush Tool is very similar to using an ordinary paintbrush. Paintbrush Tool creates a smooth paint stroke of the currently selected Foreground color.

Perform the following steps to use Paintbrush Tool:

1. *Open* an image in which you want to use Paintbrush Tool (Fig.G-2.52).
2. *Select* **Paintbrush Tool** from the Toolbox, as shown in Fig.G-2.52:

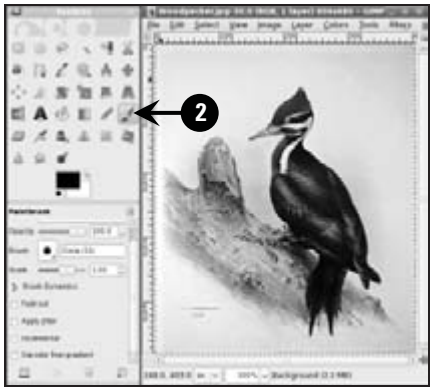


Fig.G-2.52

3. *Drag* the **Opacity** slider to set the opacity according to your requirement. In our case, we have set it to 36.2 (Fig.G-2.53).
4. *Click* the arrow at the lower right corner of the **Brush** icon to select a brush type (Fig.G-2.54).
   A list of brush types appears (Fig.G-2.54).
5. *Select* a brush type from the list. In our case, we have selected **Grid** (Fig.G-2.54).

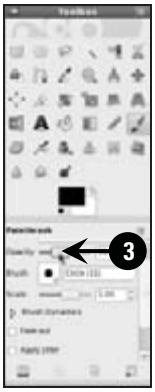


Fig.G-2.53

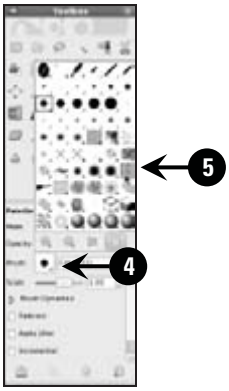


Fig.G-2.54

6. *Drag* the mouse pointer on the image window to draw a stroke. As you drag the mouse pointer, a trail of the foreground color is drawn (Fig.G-2.55).
7. *Select* the **Fade out** check box from the Tool Option dialog box (Fig.G-2.56).
8. *Drag* to draw strokes. Notice that now the strokes fade out after a distance (Fig.G-2.56).

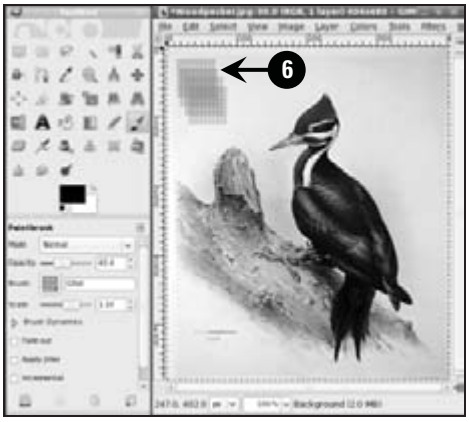


Fig.G-2.55

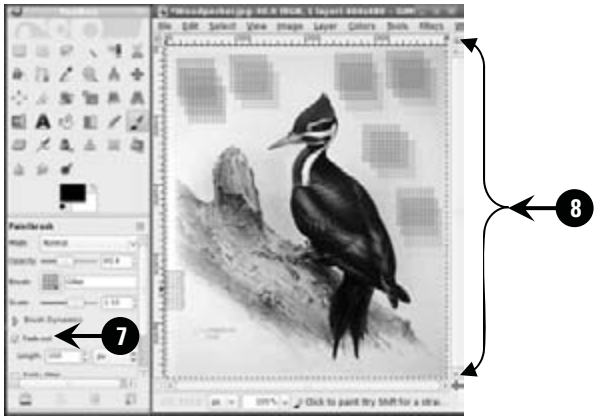


Fig.G-2.56

Let's now learn to use Pencil Tool.

Using Pencil Tool

Pencil Tool is used to free-form drawings with hard edges.

Perform the following steps to draw some strokes on the preceding image, by using Pencil Tool:

1. *Select* **Pencil Tool** from the Toolbox (Fig.G-2.57).
2. Set the opacity from the **Opacity** slider. In our case, we have set it to **48.9** (Fig.G-2.57).
3. *Select* a brush type from the **Brush** icon (Fig.G-2.57).
4. *Drag* the **Scale** slider to set the size of the selected brush (Fig.G-2.57).
5. *Click* anywhere on the image to mark the starting point from where you want to use Pencil Tool. In our case, we are drawing a straight line, and the starting point is the point from where the line will start.
6. *Press* the **SHIFT** key, and, keeping the key pressed, move the mouse pointer to the part of the image where you want to end the line (Fig.G-2.58).

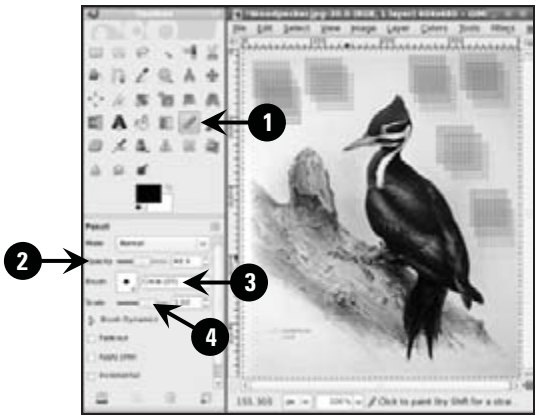


Fig.G-2.57

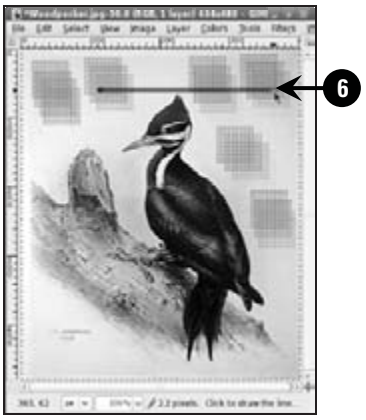


Fig.G-2.58

7. *Draw* more lines in the same way. In our case, we have created a box around the image, as shown in Fig.G-2.59:

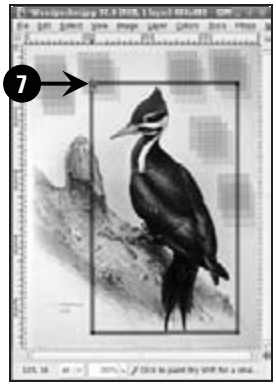


Fig.G-2.59



Similar to Paintbrush Tool and Pencil Tool, you can use Airbrush Tool on an image. This tool is used to paint soft strokes, and is useful for shading effects.

In the preceding section, you learned about the Painting tools available in GIMP. Let's now discuss the Editing tools.

Working with Editing Tools

The Editing tools of GIMP allow you change and edit images in a variety of ways. Examples of Editing tools are Blur/Sharpen, Smudge, and Dodge/Burn. These tools can be used on a selection of an image or on the entire image. Some of these tools, such as Blur/Sharpen have only one button on the Toolbox, which you can use to switch between the two tools. You can switch between these two tools by using the Blur or Sharpen options of the Tool Options window.

The following Editing tools are available in GIMP:

- **Blur/Sharpen Tool**: Refers to a combination of two tools, Blur Tool and Sharpen Tool. You can select one tool at a time from the Tool Options window. Blur Tool is used to reduce the contrast of an image while Sharpen Tool is used to increase the contrast.
- **Smudge Tool**: Refers to the tool used to distort colors on an active layer or a selected portion of an image. It takes the colors surrounding the selected portion and mixes them up to create the smudge effect.

- **Dodge/Burn Tool**: Refers to the combination of two tools, Dodge Tool and Burn Tool. You can select only one option from the Tool Options window, at a time. Dodge Tool is used to lighten the pixels in an image while Burn Tool is used to darken the pixels.
- **Clone Tool**: Refers to the tool used to remove spots or other defects from an image.

Let's now discuss these tools in detail and learn to use them, starting with Blur Tool.

Using Blur Tool

Blur Tool is used to blur or soften the intensity of the area of an image where it is applied. It works by reducing the contrast among the pixels of the selected area. This tool is very useful in editing images that have jagged edges.

Perform the following steps to use Blur Tool on an image:

1. *Select* **Blur/Sharpen Tool** from the Toolbox (Fig.G-2.60).
2. *Select* the **Blur** radio button under **Convolve Type (Ctrl)** from the Tool Options window (Fig.G-2.60).
3. *Click* the **Brush** icon and *select* a brush type from the list. In our case, we have selected the **Circle (19)** brush type **(**Fig.G-2.61).

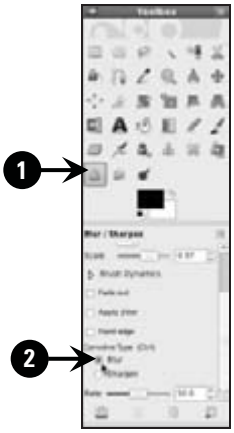


Fig.G-2.60

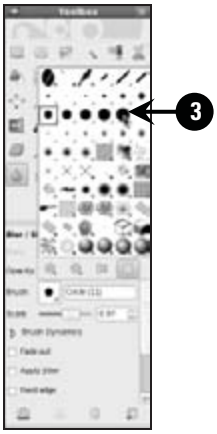


Fig.G-2.61

4. *Drag* the **Scale** slider to set the size of the selected brush. In our case, we have set this as 1.10 (Fig.G-2.62).
5. *Drag* the mouse pointer over the area of the image where you want to apply the blur. We have applied it over the head of the bird (Fig.G-2.63).

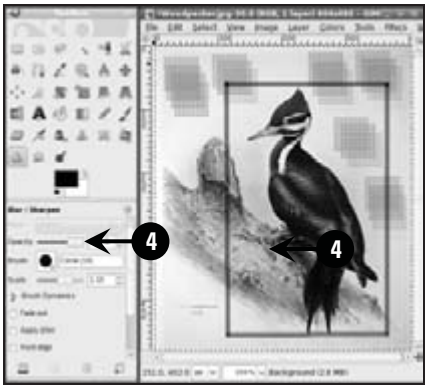


Fig.G-2.62



Fig.G-2.63

6. *Press* the **CTRL** + **Z** keys in combination from the keyboard to undo the blur changes.

Let's now learn about to use Sharpen Tool.

Using Sharpen Tool

The effect of Sharpen Tool is the opposite to that of Blur Tool. This tool sharpens the image, giving it a hard and clear appearance. Therefore, this tool is used on images that are not very clear. By increasing the contrast between pixels, Sharpen Tool improves the clarity of an image. Let's now learn to use the Blur, which are located under the Convolver Type option.

Perform the following steps to sharpen a selection:

1. *Select* the **Blur/Sharpen Tool** from the Toolbox (Fig.G-2.64).
2. *Select* the **Sharpen** radio button under **Convolve Type (Ctrl)** from the Tool Options window (Fig.G-2.64).
3. *Click* the **Brush** icon. A list of brush types appears.
4. *Select* a brush type from the list. In our case, we have selected **Circle (19)** (Fig.G-2.60).
5. *Drag* the **Scale** slider to set the size of the selected brush. In our case, we have set it to **1.10.**
6. *Drag* the mouse pointer over the area where you want to **sharpen the image part**. In our case, we have applied the blur over the beak and head of the bird (Fig.G-2.65).

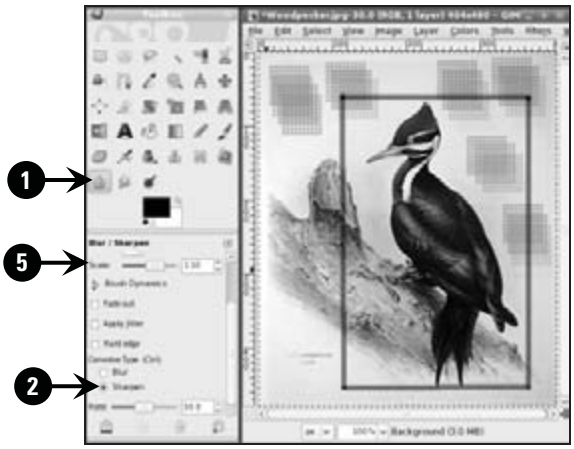


Fig.2.64

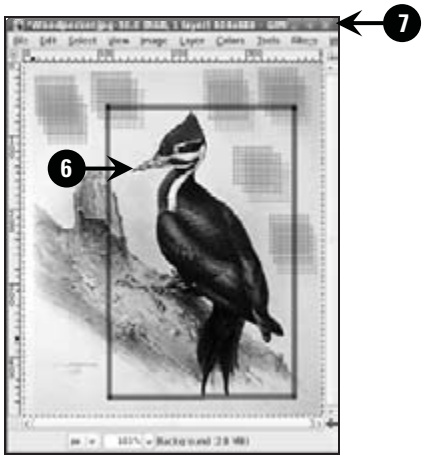


Fig.G-2.65

7. *Close* the image window by clicking the Close button from the Title bar (Fig.G-2.65).

Let's now learn to use Smudge Tool.

Using Smudge Tool

Smudge Tool is used to create an effect similar to the one that is created when you paint with your fingers. This tool is very useful for editing and repairing old images.

Perform the following steps to use Smudge Tool to modify an image:

1. *Open* the image on which you want to use Smudge Tool (Fig.G-2.66).
2. *Select* **Smudge Tool** from the Toolbox (Fig.G-2.66).
3. *Select* a brush type from the **Brush** icon (Fig.G-2.66).
4. *Drag* the **Scale** slider to set the size of the selected brush (Fig.G-2.66).
5. *Select* the **Fade out** check box to apply the fading effect (Fig.g-2.66).
6. *Drag* the mouse pointer over the area of the image that you want to apply the smudge (Fig.G-2.67).

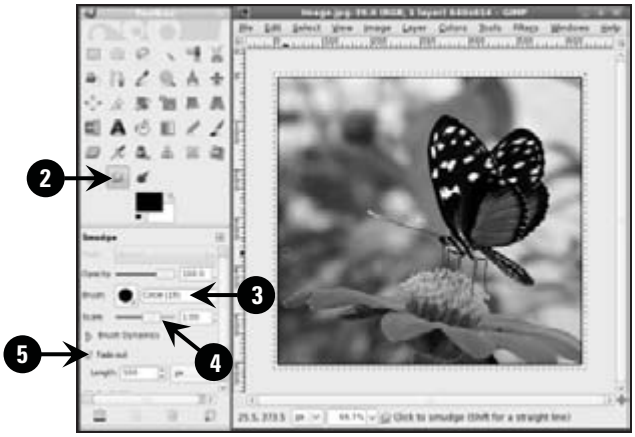


Fig.G-2.66



Fig.G-2.67

The smudge is applied on the selected area of the image (Fig.G-2.67).

Let's now learn to use Clone Tool.

Using Clone Tool

One of the most useful and interesting Editing tools in GIMP is Clone Tool. This tool is used to copy or duplicate (clone) the selected areas of an image. Using this tool, you can easily remove blemishes or scratches from an image. It is a convenient tool to use for repairing old images quickly. When using Clone Tool, you first have to set a source point of the image from where you want to clone pixels, and then drag the mouse over the area where these cloned pixels are to be placed. Before using Clone Tool, however, it is worthwhile to first discuss the important options associated with this tool. You have to set certain options in the Tool Options window to use Clone Tool efficiently. The following is a brief description of these options:

- **Source:** Sets the type of source that is to be cloned over an area of an image. By default, the Image Source radio button under this option is selected. Due to this, the pixels are cloned from an image. However, if the Pattern radio button is selected, then the currently selected pattern instead of the image source is cloned in the area where you drag the mouse.
- **Alignment:** Allows you to select the alignment options, that is, None, Aligned, Registered, and Fixed. None refers to the option in which each brush stroke is treated separately. The Aligned option defines the relation between the source point and the brush point (the point where you click to create the clone). The Registered option clones parts of an image from one layer to another layer within the same image, and the Fixed option keeps the source fixed.

Perform the following steps to repair an image by using Clone Tool:

1. *Open* an image in which you want to use Clone Tool (Fig.G-2.68).
2. *Select* **Clone Tool** from the Toolbox (Fig.G-2.68).
3. *Select* a radio button under the **Source** option from the Tool Options window. In our case, we have selected the **Image** radio button (Fig.G-2.68).
4. *Select* an alignment option from the **Alignment** list box. In our case, we have selected the **Aligned** option (Fig.G-2.68).
5. *Move* the mouse pointer to the area of the image from where pixels are to be cloned. *Press* the **CTRL** key and *click*. A cross-hair cursor appears at the point where you click (Fig.G-2.69).

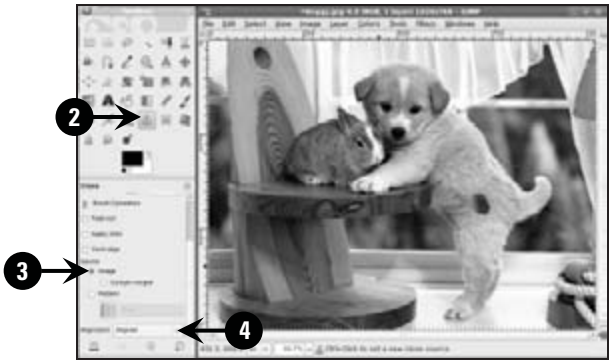


Fig.G-2.68



Fig.G-2.69

6. *Move* the mouse pointer over the damaged area (that is, the spot) of the image.
7. *Drag* the mouse pointer over the spot. As you drag the mouse pointer over the spot, the spot begins to clear (Fig.G-2.70).

   After the image is repaired, the spot is completely removed (Fig.G-2.71).



Fig.G-2.70



Fig.G-2.71

Let's now learn to use Dodge/Burn Tool.

Using Dodge /Burn Tool

The function of Dodge/Burn Tool is to lighten or darken the pixels of an image. Dodge Tool is used to lighten the pixels of the image, thereby lightening its unnecessarily dark portions. Burn Tool is used to darken the pixels, which is helpful in reducing the excessive brightness from an image or a portion of an image.

Perform the following steps to use Dodge Tool:

1. *Open* an image (Fig.G-2.72).
2. *Select* **Dodge/Burn Tool** from Toolbox (Fig.G-2.72).
3. *Select* th**e Dodge** radio button under the **Type (Ctrl)** option from the Tool Options window (Fig.G-2.72).
4. *Select* a range of pixels option under **Range** in the Tool Options window to apply the effect to the lightest pixels, darkest pixels or to the average tone of pixels. In our case, we have selected **Highlights**, as shown in Fig.G-2.72:

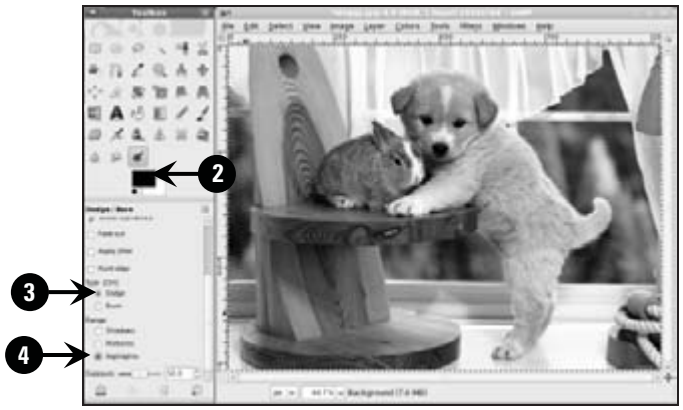


Fig.G-2.72

The Range option contains three options: Shadow, Midtones, and Highlights. The Shadows option applies the effect of Dodge Tool only to the darkest pixels, the Midtones option applies the effect to the pixels of average tone, and the Highlights option applies the effect on the lightest pixels.

5. *Click* the arrow present at the lower right corner of the **Brush** icon. A list of brush type appears (Fig.G-2.73).
6. *Select* a brush type. In our case, we have selected the **Circle (15)** brush type, as shown in Fig.G-2.73:

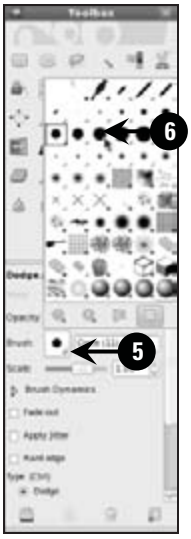


Fig.G-2.73

7. *Drag* the **Scale** slider to set a brush size. In our case, we have set the scale to **1.10** (Fig.G-2.74).
8. *Drag* the mouse pointer on the area where you want to apply the dodge effect. The pixels of the selected area of the image are bright in our case (Fig.G-2.74).
9. *Drag* the mouse pointer until the desired area is highlighted (Fig.G-2.75).
10. *Release* the mouse button when the process is complete. The highlighted area of the image (Fig.G-2.75).

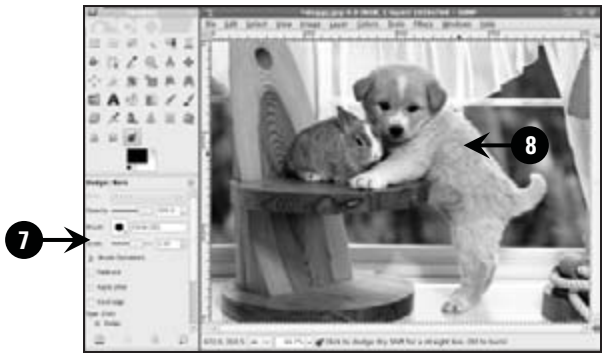


Fig.G-2.74

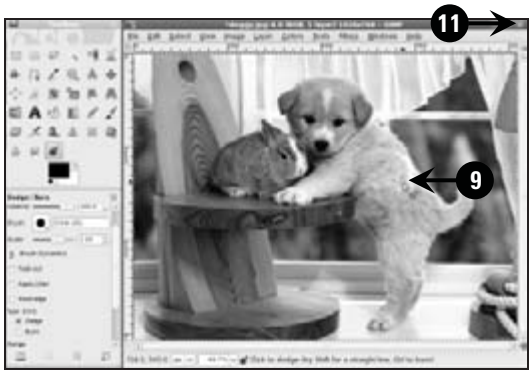


Fig.G-2.75

11. *Save* the image and *click* the **Close** button on the Title bar of the image window of GIMP to close the window.



The Burn option is the opposite of the Dodge option, that is, this option is used to darken an area of an image. You can use Burn Tool in the same way as you have used Dodge Tool.

After learning how to work with the Editing tools, let's discuss the tools that are used to transform images in GIMP.

Transforming Images

Transforming an image is the process by which we change the presentation of the image. In GIMP, you can transform an image in many ways, such as by scaling it, rotating it, changing its perspective, distorting it, and flipping it. GIMP allows you to transform an entire image, a specific selection, or an individual layer. GIMP provides you the following Transform tools:

- **Alignment Tool**: Arranges the image layers that contain various objects in the image
- **Move Tool**: Moves a layer, selection, or a path of an image
- **Crop Tool**: Crops an image
- **Rotate Tool**: Rotates a layer, selection, or objects, in an image
- **Scale Tool**: Increases or decreases the size of an image or a selection
- **Shear Tool**: Distorts an image. This tool allows you to shift one part of an image, a layer, a selection or a path in a particular direction.
- **Perspective Tool**: Helps to distort the image. This tool allows you to modify the perspective of the active layer, of a selection or of path.
- **Flip Tool**: Flips an object horizontally or vertically

Let's now learn to use these Transform tools in the following sections.

Rotating an Image or a Selection

While transforming an image or a selected portion of an image, you may need to rotate the image or selection. GIMP provides you Rotate Tool to perform this action. Using this tool, you can rotate an image in the clockwise or anticlockwise direction. You can also specify the angle by which you want to rotate the image.

Perform the following steps to rotate an image or a selection:

1. *Open* an image (Fig.G-2.76).
2. *Select* the image or an area of the image by using **Rectangle Select Tool** from the **Toolbox** (Fig.G-2.76).
3. *Select* **Rotate Tool** from the Toolbox (Fig.G-2.76).

4. *Click* the **Layer** button beside the **Transform** option in the Tool Options window (Fig.G-2.76).
5. *Click* the selection (Fig.G-2.77).

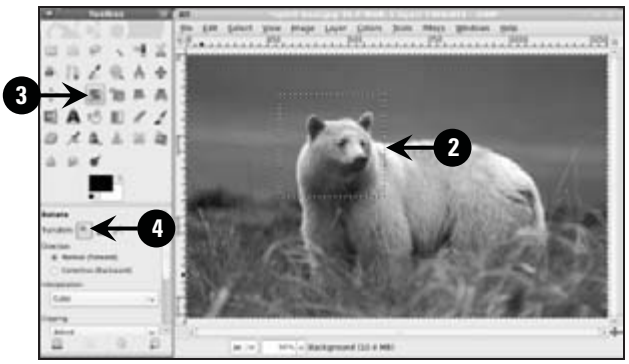


Fig.G-2.76



Fig.G-2.77

The **Rotate** dialog box appears (Fig.G-2.78).

6. *Set* a rotation angle in the **Angle** spin box to set the angle by which you want the selection to rotate (Fig.G-2.78).
7. *Set* a unit to specify for the measuring the Center X and Center Y axis. In our case, we have set the unit as **px** (Fig.G-2.78).
8. *Set* the center of the rotation from the **Center X** and **Center Y** spin boxes (Fig.G-2.78).
9. *Click* the **Rotate** button (Fig.G-2.78).

   The selected portion of the image is rotated to the specified angle (Fig.G-2.79).

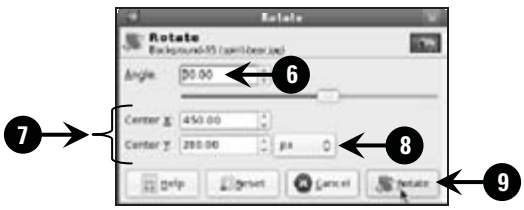


Fig.G-2.78



Fig.G-2.79

10. *Press* the **CTRL+Z** keys in combination from the keyboard to undo the rotation and revert the image to its original state.

Let's now use this image to show the next operation, which is, scaling an image or a selection.

Scaling an Image or Selection

Scaling is a process of re-sizing an image. In GIMP, you can increase or decrease the size of an image or a selection by using Scale Tool:

Perform the following steps to scale an image or a selection:

1. *Open* an image. In our case, we are using the image we opened in the last section.
2. Select an area of the image that you want to scale (Fig.G-2.80).
3. *Select* **Scale Tool** from the Toolbox (Fig.G-2.80).
4. *Select* the **Layer** button beside the **Transform** option in the Tool Options window (Fig.G-2.80).

5. *Drag* the vertical scroll bar down from the Tool Options window (Fig.G-2.81).
6. *Select* the **Keep aspect (Ctrl)** check box so that the width and height of the selection is increased or decreased by the same proportion (Fig.G-2.81).

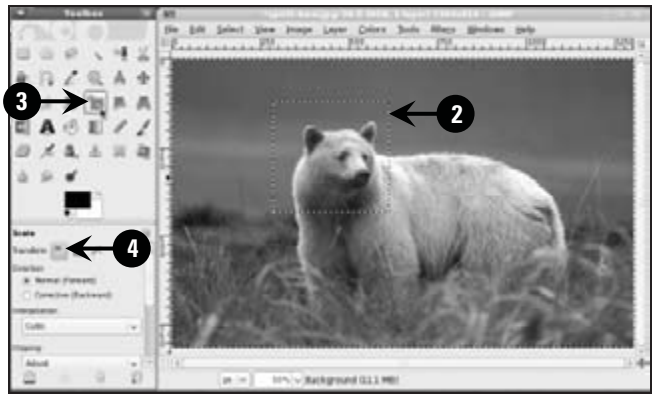


Fig.G-2.80

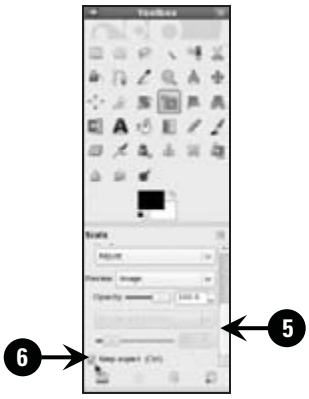


Fig.G-2.81

7. *Click* anywhere on the image, as shown in Fig.G-2.82:

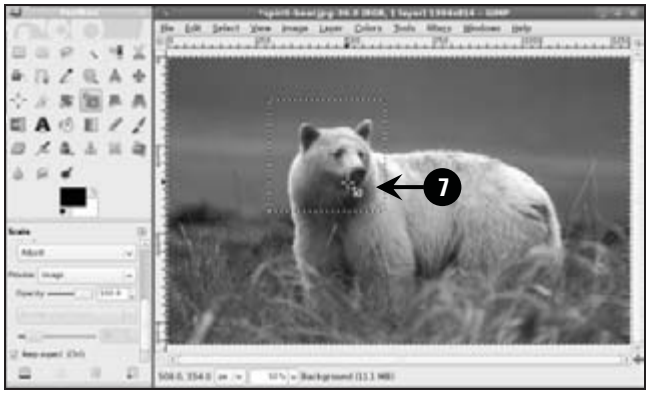


Fig.G-2.82

The **Scale** dialog box appears (Fig.G-2.83).

8. *Set* the unit to define the size of the selection. In our case, we have defined the unit as pixels (Fig.G-2.83).
9. *Set* the width and height of the selection from the **Width** and **Height** spin boxes, respectively (Fig.G-2.83).
10. *Click* the **Scale** button, as shown in Fig.G-2.83:

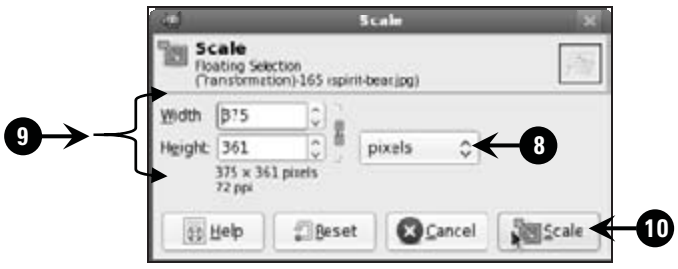


Fig.G-2.83

As soon as you click the Scale button in the **Scale** dialog box, the size of the selected portion of the image changes, as shown in Fig.G-2.84:



Fig.G-2.84

Let's now learn how to distort an image or a selection.

Distorting an Image or a Selection

You can also transform an image or a selection by distorting it. Distortion helps you to change the shape of an image to create a special effect. GIMP provides Shear Tool and Perspective Tool to apply the distortion effect. These tools help to modify one or two edges of an image or a selection while keeping the other edges fixed. This stretches the image from one side and distorts it.

Perform the following steps to distort a selection:

1. *Open* an image. In our case, we are proceeding from the image opened in the last section.
2. *Select* in the area of an image that you want to distort (Fig.G-2.85).
3. *Select* **Perspective Tool** from the Toolbox (Fig.G-2.85).
4. *Select* the **Layer** button beside the T**ransform** option in the Tool Options window, as shown in Fig.G-2.85:

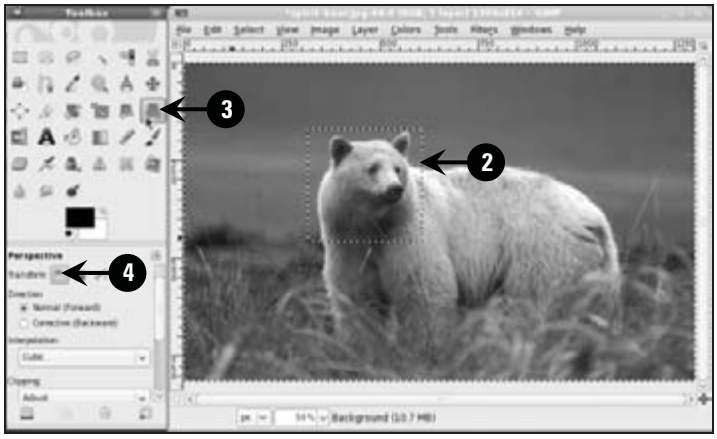


Fig.G-2.85

5. *Click* anywhere on the selection (Fig.G-2.86).
   The **Perspective** dialog box appears (Fig.G-2.87).
6. *Drag* the selection to distort the image (Fig.G-2.87).



Fig.G-2.86



Fig.G-2.87

7. *Click* the **Transform** button (Fig.G-2.88).
   The image is distorted (Fig.G-2.89).

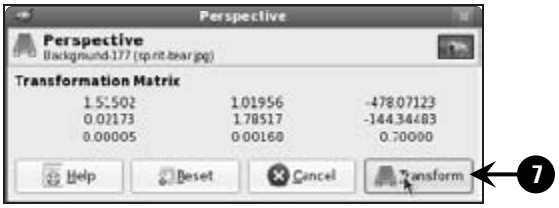


Fig.G-2.88



Fig.G-2.89

8. *Click* the **Close** button from the Title bar to close the image without saving the changes.

Let's now learn about how to use Flip Tool.

Using Flip Tool

The Flip tool is used to flip or rotate an image horizontally or vertically. This can be use to create a reflection of an image.

Perform the following steps to flip an image:

1. *Open* an image (Fig.G-2.90).
2. *Select* **Flip Tool** from the Toolbox (Fig.G-2.90).
3. *Select* the **Horizontal** or **Vertical** radio button under **Flip Type (Ctrl)** to flip the image horizontally or vertically, respectively. In our case, we have selected the Horizontal radio button (Fig.G-2.90).
4. *Click* the image in the image window (Fig.G-2.91).



Fig.G-2.90

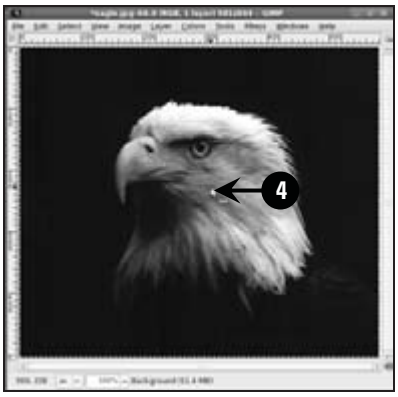


Fig.G-2.91

The image after flipping appears (Fig.G-2.92).

5. *Select* **File→Save** (Fig.G-2.93).



Fig.G-2.92



Fig.G-2.93

After saving image, let's now learn how to quit GIMP.

Quitting GIMP

When you finish you work in GIMP, you can quit the application. However, be sure to save your work before exiting. You can quit the GIMP program by clicking the **Close** button from the Toolbox, as shown in Fig.G-2.94:



Fig.G-2.94

You return to the desktop.

With this, we come to the end of this chapter. Before proceeding to the next chapter, let's summarize the main points of this chapter.

Summary

This chapter has discussed the various tools available in GIMP. You have learned about the Selection tools, as well as their use in moving, editing, and filling a selection. You have also learned about the Painting tools, such as Paintbrush Tool and Pencil Tool, and used them in an image. In addition, the chapter has discussed the Editing tools, such as Blur Tool, Sharpen Tool, and Smudge Tool. Apart from this, you have learned about the various Transform tools, which are used to rotate, scale, flip, and distort an image. The various options related to all these tools have been also been explained. After you have learned about all these tools, the chapter concludes by showing you how to quit the GIMP program.

CHAPTER

3

Working with Layers and Text

In this Chapter:

- Exploring the Layers Dialog Box
- Creating a Layer
- Working with a Layer
- Working with the Text
- Loading a Text File in an Image
- Quitting the GIMP Application

Layers can be defined as the sheets of pixels that can be edited separately, without affecting the other layers of an image. Layers provide flexibility to add layers and editing of images. They help you to keep various elements of an image separate from each other so that when one of these elements is changed, the underlying or surrounding pixels remain unchanged. Layers are like a stack of transparent plastic sheets placed on top of one another, creating a composite image. You can also adjust the transparency in a layer or blend it with other layers in different ways using the layer modes. You can add text to different layers of the image. This makes the image appealing and converts it into a form of newsletter or brochures.

In this chapter, you get familiar with the Layers dialog box. Next, you learn how to create a new layer and learn to work with the layers of an image. You also learn how to add text to layers and load a text file in an image. In the end, you learn how to quit the GIMP application.

Let's now start with the Layers dialog box.

Exploring the Layers Dialog Box

When you open GIMP for the first time, the Layers, Channels & Paths window appears in GIMP interface along with some other window. This window contains four tabs, Layers, Channels, Paths, and Undo History. Out of these tabs, the Layers tab is selected, by default. The Layers tab shows the names and miniatures of all the layers present in the current image. It also shows the currently active layer and its properties. Using the Layers dialog box, you can create, delete, show and hide layers, and can also merge and link them.

Following are some of the options present in the Layers dialog box:

- **Mode:** Refers to the way a layer blends with the layers beneath it.
- **Opacity:** Determines opaqueness of a layer. The default value of opacity for a layer is 100. The lesser the value of opacity, the more transparent a layer is.
- **New Layer:** Creates a new layer.
- **Stack:** Refers to the two icons beside the New Layer icon, represented by an up-arrow and a down-arrow. Using the Stack icons, you can change the order of the layers. For example, clicking the down-arrow stack icon shifts the active layer below the layer placed next to it in the Layers dialog box.
- **Duplicate Layer:** Creates a copy of the current layer. This duplicate copy is located at the same position in the image as the original layer.
- **Delete Layer:** Deletes a layer from the image. When you click this icon, the current layer is immediately deleted.

To work with the Layers dialog box, you need to first open it in the GIMP window if it is closed. Perform the following steps to open the **Layers** dialog box:

1. *Click* the **Windows** menu from the Menu bar. A drop-down menu appears (Fig.G-3.1).
2. *Select* the **Recently Closed Docks** option from the drop-down menu. A submenu appears (Fig.G-3.1).
3. *Select* the **Layers, Channels, Paths, Undo-Brushes** option, as shown in Fig.G-3.1:

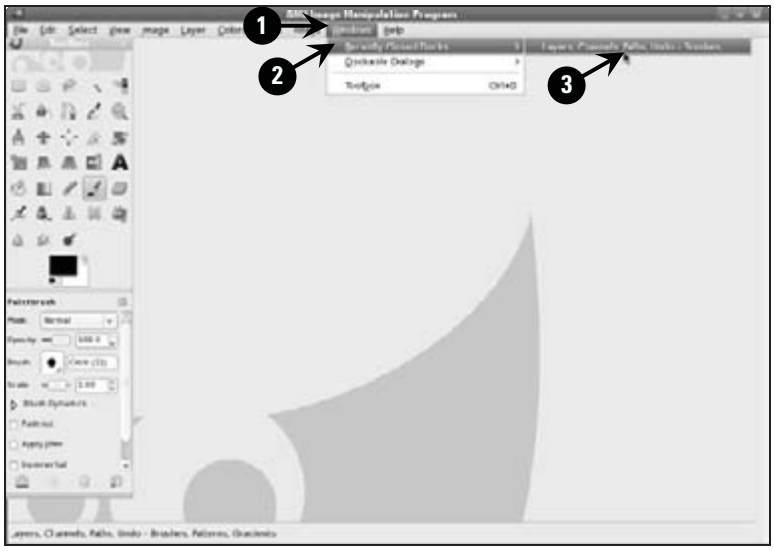


Fig.G-3.1

The **Layers, Channels and Paths** window appears on the screen and displays the **Layers** dialog box, as shown in Fig.G-3.2:

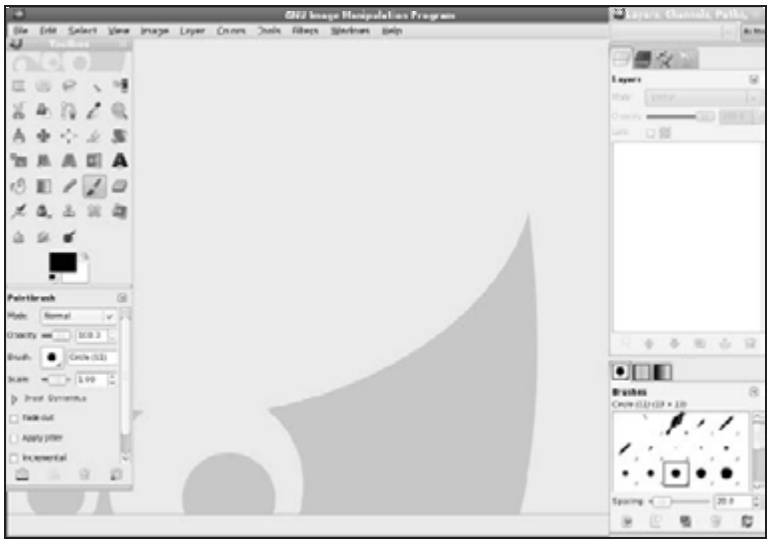


Fig.G-3.2

The Layers dialog box displays each layer of an image as rows according to its order in the image. This means that the topmost layer of the image is displayed as the topmost row in the Layers dialog box. Every image has a Background layer. If you change the position of a layer in the Layers dialog box, its position in the image is also affected. The visibility of the layers is indicated by the eye icon, which is present on the left side of all the layers. When the eye icon of any of the layers is hidden from the Layers dialog box, the layer will not be visible in the image, although it would be present in the image. You can toggle a layer by showing or hiding its eye icon in the Layers palette. You need to open an image to view a layer.

Perform the following steps to open an image:

1. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.G-3.3).
2. *Select* the **Open** option, as shown in Fig.G-3.3:

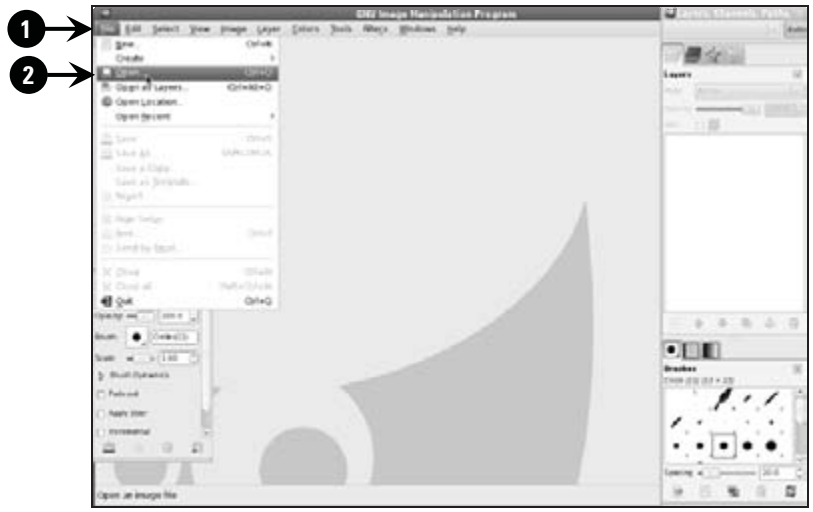


Fig.G-3.3

The **Open Image** dialog box appears (Fig.G-3.4).

3. *Select* the location from the **Places** pane, to select the folder where the desired image is saved. In our case, we have selected the **kogent** folder (Fig.G-3.4).

   A list of files and folders present in the **kogent** folder appears in the middle pane of the dialog box (Fig.G-3.4).
4. *Select* the desired folder from the list. In our case, we have selected the **Download** folder (Fig.G-3.4).
5. *Click* the **Open** button (Fig.G-3.4).

   A list of files and folders present in the **Download** folder appears in the **Open Image** folder (Fig.G-3.5).
6. *Select* the image that you want to open from the Name pane. In our case, we have selected the **flower.jpg** image (Fig.G-3.5).
7. *Click* the **Open** button (Fig.G-3.5).

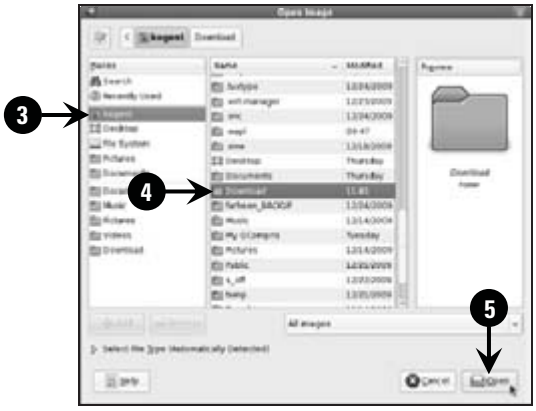


Fig.G-3.4

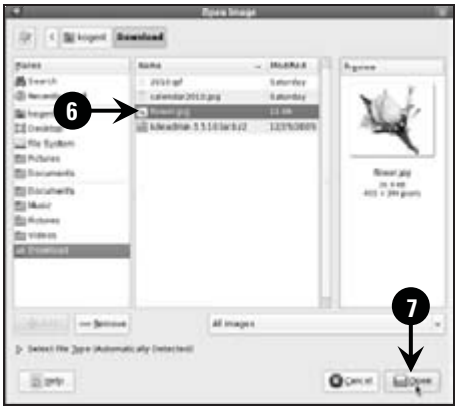


Fig.G-3.5

The image gets open, as shown in Fig.G-3.6:



Fig.G-3.6

Let's now learn how to create a new layer.

Creating a Layer

An image layer can be created by using various methods, such as by copying some part of another image or the same image and pasting the copied part into the desired image. You can create a layer by performing the following tasks:

- Using the Create New Layer button
- Copying a part of another image

Let's discuss these in detail.

Using the Create New Layer Button

You can create a new by clicking the Create New Layer button from the Layers dialog box. Perform the following steps to create a new layer:

1. *Click* the **Create New Layer** button, as shown in Fig.G-3.7:



Fig.G-3.7

The New Layer dialog box appears (Fig.G-3.8).

2. *Select* the default name, **New Layer**, which appears in the **Layer name** text box (Fig.G-3.8).

3. *Type* the desired name of the layer. In our case, we have typed **My_layer** as the name of the layer (Fig.G-3.9).
4. *Enter* the width and height of the new layer from the Width and Height spin boxes, respectively. In our case, we have taken the default values (Fig.G-3.9).
5. *Select* the **Background color** radio button (Fig.G-3.9).
6. *Click* the **OK** button (Fig.G-3.9).



Fig.G-3.8

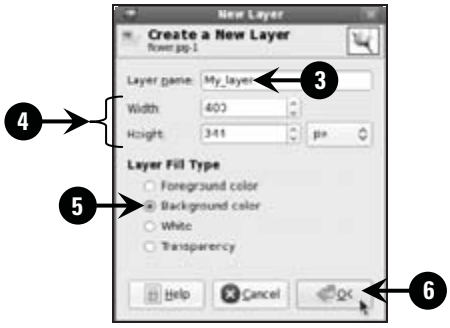


Fig.G-3.9

An image window displaying the new layer, as shown in Fig.G-3.10:

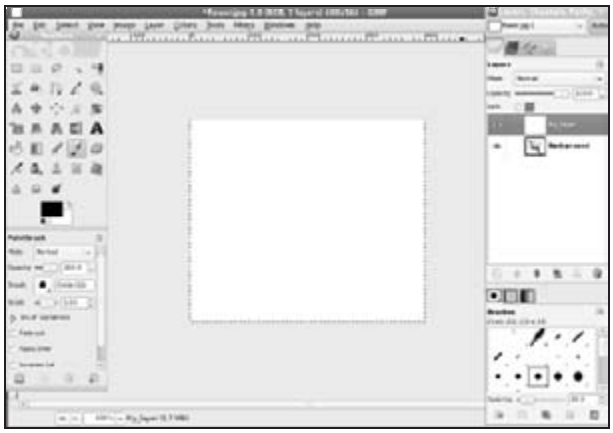


Fig.G-3.10



The layer created in the preceding section is blank as we have not added any image to it. A blank layer is created as per the specification enter in the New Layer dialog box**, which is the background layer in our case.**

Copying a Part of Another Image

You can also create layers containing parts of other images. You can cut or copy a portion of the same image or another image and paste it into the image in which you want to create the new layer. Perform the following steps to create a new layer containing a portion of another image:

1. *Click* the down-arrow stack icon to open a layer. In our case, we have opened the **Background** layer (Fig.G-3.11).

   The layer gets open (Fig.G-3.12).
2. *Select* any selection tool from **Toolbox**. In our case, we have selected **Rectangle Select Tool (**Fig.G-3.12).

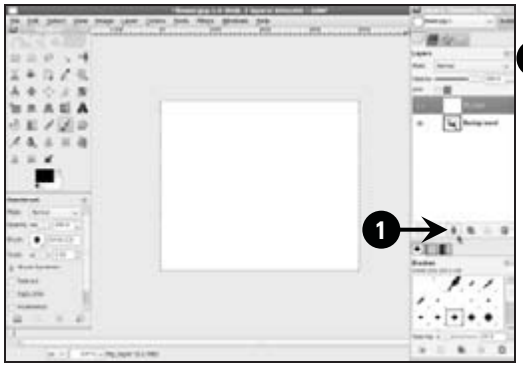


Fig.G-3.11



Fig.G-3.12

3. *Select* the portion of the image that you want to insert in a new layer (Fig.G-3.13).
4. *Right-click* anywhere on the layer. A context menu appears (Fig.G-3.14).
5. *Select* the **Edit** option from the context menu. A sub menu appears (Fig.G-3.14).
6. *Select* the **Copy** option (Fig.G-3.14).

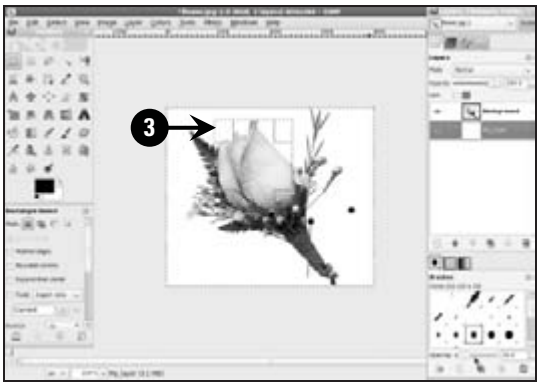


Fig.G-3.13

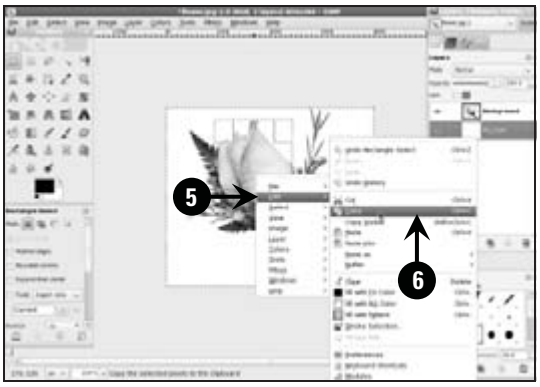


Fig.G-3.14

The selected portion gets copied and stored into the clipboard.

7. *Right-click* the blank space. A context menu appears (Fig.G-3.15).
8. *Select* the **Edit** option from the context menu. A sub menu appears (Fig.G-3.15).
9. *Select* the **Paste** option, as shown in Fig.G-3.15:

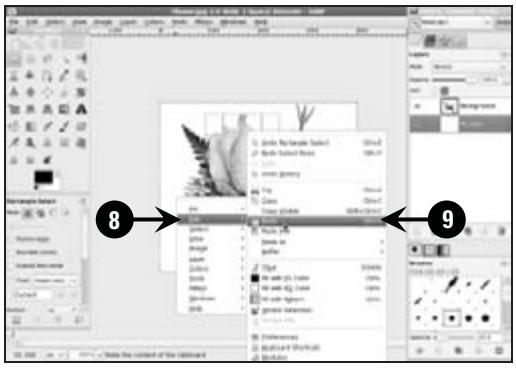


Fig.G-3.15

A new layer is added to the Layers dialog box with the name **Floating Selection**, as shown in Fig.G-3.16:



Fig.G-3.16

When you anchor this layer, then it will be disappear.



When you paste a portion of an image containing a portion of another image, then by default, a layer created by name Floating Selection, and this layer becomes the active layer.

Let's now learn to work with a layer.

Working with a Layer

You can perform various tasks on a layer, such as selecting, moving and hiding/showing. Before performing any task on a layer, you need to select that layer.

You learn to perform following tasks on a layer:

- Selecting a layer
- Moving the layer
- Renaming the layer
- Hiding/showing the layer
- Reordering the layer
- Merging layers
- Deleting the layer

Let's discuss all these in detail.

Selecting a Layer

You can only work on a layer when it is selected. When a layer is selected it gets highlighted. You can select a layer, by clicking it.



In the Layers, Cannels, Paths window, there are three layers. We have created one more layer named as Pasted layer.

In our case, we have selected the Background layer (Fig.G-3.17).

The selected layer gets highlighted (Fig.G-3.18).



Fig.G-3.17



Fig.G-3.18

Now whatever changes, you make to the current image, those will be only applied to the content of the Background layer.

Let's now learn to move a layer.

Moving the Layer

As discussed, you can perform a number of different tasks on the active layer. You can also move the active layer from one location to another in the image. Let's move the layer selected in the preceding section by performing the following steps:

1. *Select* the **Move** tool (Fig.G-3.19).
2. *Place* the mouse-pointer to the active layer (Fig.G-3.20).



Fig.G-3.19



Fig.G-3.20

3. *Drag* the layer as per requirement (Fig.G-3.21).



Fig.G-3.21



Fig.G-3.22

The layer is moved to a new location (Fig.G-3.22).

Let's now learn how to rename a layer.

Renaming the Layer

GIMP provides you the rename feature using which you can change the name of the layer as per your requirement.

Perform the following steps to rename a layer:

1. *Double-click* the layer name that you want to rename. In our case, we have double-clicked the **Pasted Layer** layer**,** as shown in Fig.G-3.23:



Fig.G-3.23

The **Layer Attributes** dialog box appears. By default, the name of the layer is selected (Fig.G-3.24).

2. *Type* the name of layer in the **Layer name** textbox. In our case, we have typed **copied layer** (Fig.G-3.25).
3. *Click* the **OK** button (Fig.G-3.25).



Fig.G-3.24



Fig.G-3.25

The name of the layer has been changed (Fig.G-3.26).



Fig.G-3.26

Let's now learn how to hide/show the layer.

Hiding/Showing the Layer

When you hide a layer, the content of that particular layer is removed from the image. The eye icon on the left side of each layer in the Layers dialog box indicates that the layer is visible in the image. If the eye icon of a particular layer is hidden, the layer becomes hidden. You can hide a layer by clicking the eye icon beside the layer that you want to hide. In our case, we have clicked the eye icon beside the copied layer (Fig.G-3.27).

The eye icon hides (Fig.G-3.28).



Fig.G-3.27



Fig.G-3.28



When the eye icon disappears, the layer becomes invisible. You can make the hidden layer visible by clicking the empty area of the eye icon of the hidden layer. This displays the eye icon in the empty area and the hidden layer in the image.

Let's now learn how to reorder the layer.

Reordering the Layer

Layers are arranged in the order in which they were created. In this way, the layer, which is created in the end, is located at the top. However, sometimes you may need to change this order of layers according to the requirement. You can easily reorder layers by using the Layers dialog box.

Perform the following steps to reorder a layer:

1. *Select* the layer of which you want to change the order. In our case, we have selected the **Background** layer (Fig.G-3.29).
2. *Click* the down arrow stack button, as shown in Fig.G-3.29:

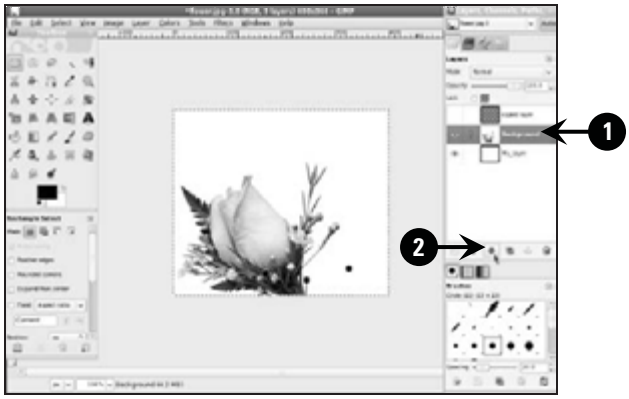


Fig.G-3.29

The **Background** layer moves downwards at the bottom, as shown in Fig.G-3.30:

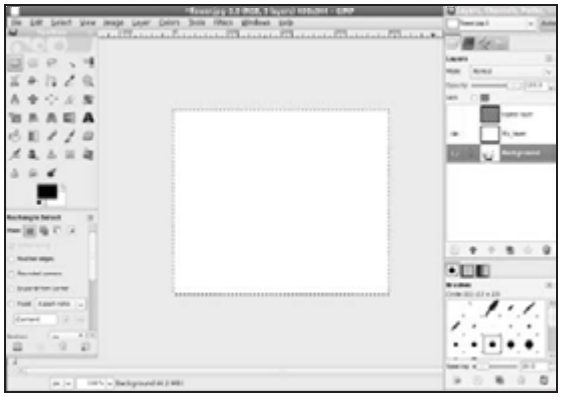


Fig.G-3.30

Let's now learn how to merge different layers.

Merging Layers

GIMP allows you to merge two or more layers. This not only allows simultaneous editing of the merged layers, but also helps in reducing the size of the file since the file size increases with the number of layers.

Perform the following steps to merge two or more layers:

1. *Right-click* any visible layer. In our case, we have right-clicked the **Background** layer. A context menu appears (Fig.G-3.31).
2. *Select* the **Merge Visible Layers** option (Fig.G-3.31).

   The **Merge Layers** dialog box appears (Fig.G-3.32).
3. *Click* the **Merge** button (Fig.G-3.32).

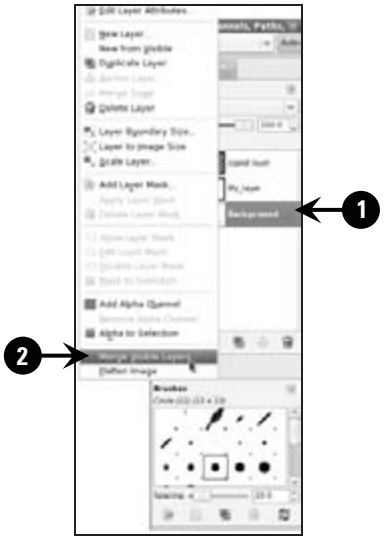


Fig.G-3.31

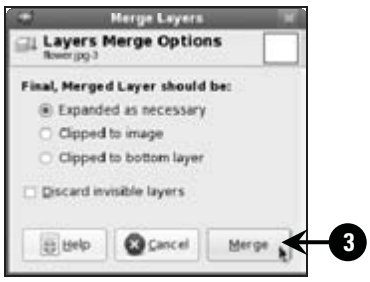


Fig.G-3.32

All the visible layers (My_layer and Background, in our case) are merged into one, and have taken the name of the topmost layer, Background, as shown in Fig.G-3.33:

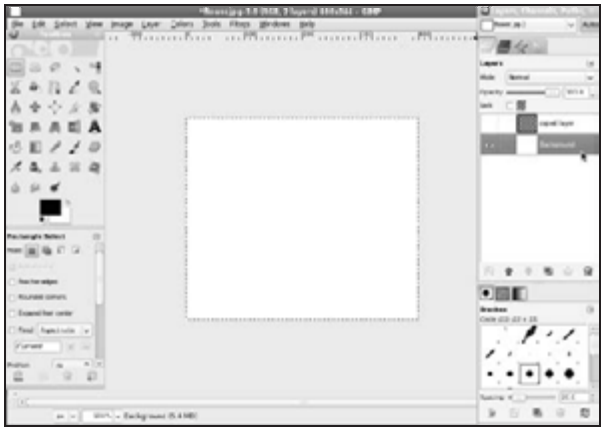


Fig.G-3.33

Let's now learn how to delete a layer.

Deleting the Layer

If a layer is not required, you can easily delete it. Perform the following steps to delete a layer:

1. *Select* the layer that you want to delete. In our case, we have selected the copied layer (Fig.G-3.34).
2. *Click* the **Delete this Layer** button (Fig.G-3.34).
   The selected layer gets deleted (Fig.G-3.35).

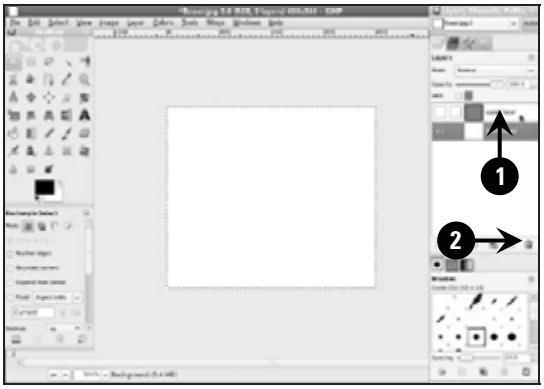


Fig.G-3.34

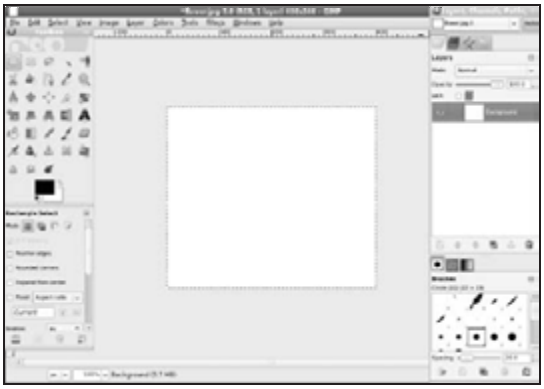


Fig.G-3. 35

Let's now learn how to work with the text.

Working with the Text

In the GIMP terminology, the text refers to a set of mathematical equations that define letters, numbers, and other characters. The text is added to a new layer of the image, by default. By adding text to images, you not only enhance their appearance but you can also convert them into brochures, newsletters, or advertisements. Perform the following steps to add text in an image:

1. *Open* an image in which you want to add text. In our case, we have opened the **whale.jpg** image (Fig.G-3.36).

2. *Select* the **Text Tool** (Fig.G-3.36).
3. *Click* at the location on the image where you want to type text (Fig.G-3.37).



Fig.G-3. 36

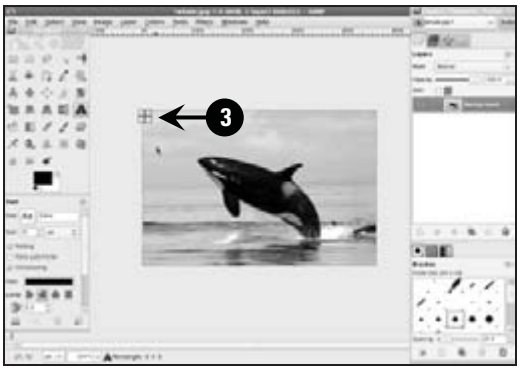


Fig.G-3. 37

The **GIMP Text Editor** dialog box appears (Fig.G-3.38).

4. *Type* the text that you want to insert in an image, in the text editor (Fig.G-3.38).
5. *Click* the **Close** button, as shown in Fig.G-3.38:

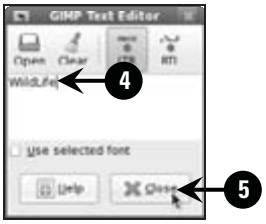


Fig.G-3. 38

The text appears on the image (Fig.G-3.39). You can change the color of the text according to the requirement.

6. *Click* the **Color** color box, as shown in Fig.G-3.39:



Fig.G-3. 39

The **Text Color** dialog box appears (Fig.G-3.40).

7. *Select* the color in which you want the text to appear. In our case, we have selected the blue color (Fig.G-3.40).
8. *Select* the shade of blue color that you want to apply (Fig.G-3.41).
9. *Click* the **OK** button (Fig.G-3.41).

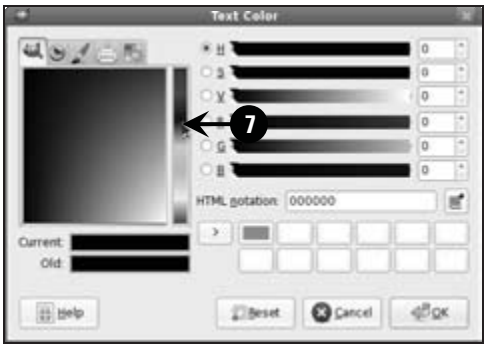


Fig.G-3. 40

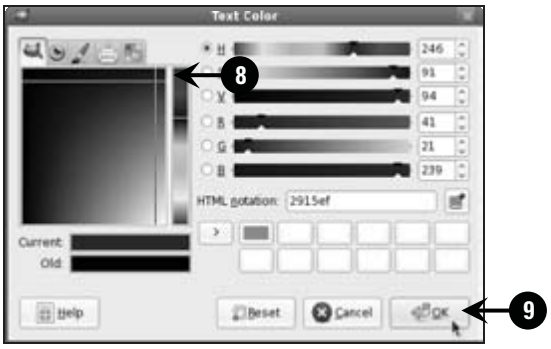


Fig.G-3. 41

The text appears in the blue color, as shown in Fig.G-3.42:



Fig.G-3. 42

Let's now learn how to load a text file in an image.

Loading a Text File in an Image

In GIMP, you can also load a text file in an image. This saves the time spent in typing the text.

Perform the following steps to load a text file in an image:

1. *Open* any image. In our case, we have opened the **wildlife_comp.jpg** image (Fig.G-3.43).
2. *Select* the **Text Tool** from Toolbox (Fig.G-3.43).
3. *Click* at the place on the image where you want to add a text file (Fig.G-3.43).
   The **GIMP Text Editor** dialog box appears (Fig.G-3.44).
4. *Select* the **Open** button (Fig.G-3.44).



Fig.G-3.43

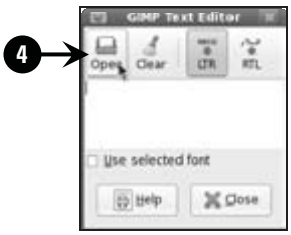


Fig.G-3. 44

The **Open Text File (UTF-8)** dialog box appears (Fig.G-3.45).

5. *D*rag the scrollbar to locate the file. In our case, we drag it down (Fig.G-3.45).
6. *Select* the required file whose text is to be inserted in the image. In our case, we have selected the **sample_file** (Fig.G-3.45).
7. *Click* the **Open** button, as shown in Fig.G-3.45:



Fig.G-3. 45

The text of the file appears in the **GIMP Text Editor** dialog box (Fig.G-3.46).

8. *Click* the **Close** button, as shown in Fig.G-3.46:



Fig.G-3. 46

The text of the file appears in the **wildlife_comp.jpg** image, as shown in Fig.G-3.47:

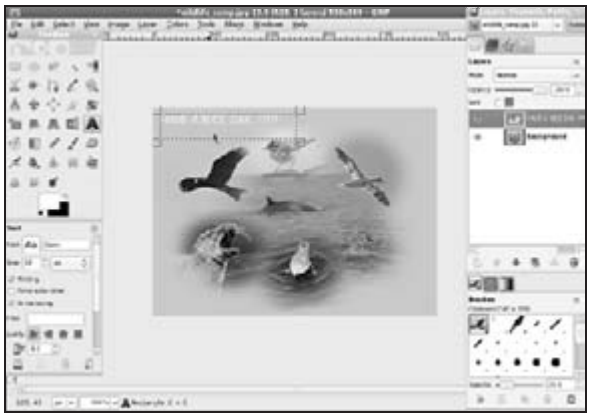


Fig.G-3. 47

You might want to use the image file for further use. Therefore, after finishing your work on the image file, save the changes you made to image.

9. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.G-3.48).
10. *Select* the **Save** option, as shown in Fig.G-3.48:

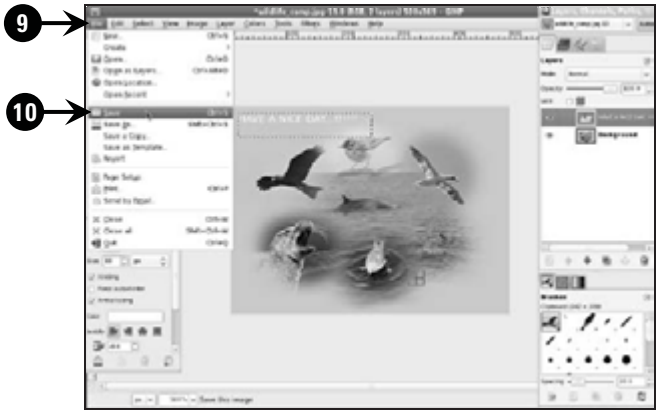


Fig.G-3.48

The **Export File** dialog box appears (Fig.G-3.49).

11. *Click* the **Export** button (Fig.G-3.49).
    The **Save as JPEG** dialog box appears (Fig.G-3.50).
12. *Click* the **Save** button (Fig.G-3.50).



Fig.G-3.49

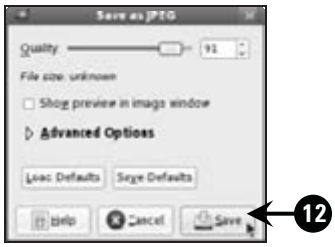


Fig.G-3.50

The file gets saved.

Quitting the GIMP Application

After completing all your work, you can quit the GIMP application. Perform the following steps to quit the GIMP application:

1. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.G-3.51).
2. *Select* the **Quit** option, as shown in Fig.G-3.51:



Fig.G-3.51

With this, we come to the end of the chapter. Now, let's summarize the key points of the chapter.

Summary

In this chapter, you have explored the layer dialog box. You have learned how to create a new layer and work with the layer. Next, you have learned to work with the text. You also learned how to load an already created text file in an image. Finally, you have learned to quit the GIMP application.

INTERNET

CHAPTER

1

Internet and Linux-Based Mozilla Firefox

In this Chapter:

- Understanding the Internet Connection
- Exploring the Features of Mozilla Firefox
- Launching Mozilla Firefox
- Understanding the Interface of Mozilla Firefox
- Browsing the Internet with Mozilla Firefox
- Downloading a Game from the Internet
- Setting Preferences in Mozilla Firefox
- Viewing the History of Visited Websites
- Using a Search Engine
- Creating a Blog
- Introducing Electronic Mail (E-Mail)
- Working with an E-Mail Account

- Signing Out of an E-mail Account
- Quitting Mozilla Firefox
- Introducing Internet Relay Chat
- Disconnecting from the Internet

In today's scenario, the Internet has gained immense popularity within a span of just a few years and today it has become the important and efficient means of communication. The Internet is a storehouse of unlimited knowledge and information. Users all over the globe find the Internet to be one of the most effective ways of exchanging information.

The idea of the Internet was conceived by Advanced Research Projects Agency (ARPA) of the US and was initially known as ARPANET. The Internet is a global collection of computers connected to one another by signals that are transmitted through terrestrial as well as microwave lines. This global network links many universities, research institutions, business empires, and government agencies throughout the world. Using a small Personal Computer (PC) and a telephone connection, you can access information from anywhere around the world through the Internet. This information can be about anything from running a small business from home to making atomic bombs. The Internet allows users from different parts of the world to communicate with each other in many ways. However, one of the most popular means of communication on the Internet is electronic mail or e-mail messages.

The Internet contains information on thousands of topics on every conceivable subject. All kinds of large and small businesses use it to advertise and sell exchange their products. The Internet is accessed through application software called Web browser. There are various Web browsers that are available in the market, such as Netscape Navigator, Mozilla Firefox, Safari, and Opera.

The Linux operating system has a built-in Web browser, Mozilla Firefox. A free and open source Web browser, Mozilla Firefox provides a quick and secure way to access the Internet. The latest version of Mozilla Firefox is 3.5. This version provides you access to many features, such as tabbed browsing, the download manager, and live bookmarking. Mozilla Firefox is more secure than Internet Explorer and is less vulnerable to the computer viruses.

The chapter discusses various aspects of Mozilla Firefox in detail. It begins by telling you the hardware and software required to set up an Internet connection, after which you learn to access the Internet. The chapter then explores the different features of Mozilla Firefox, after which you learn to launch the Web browser and get familiar with its interface. You also learn to perform common tasks in Mozilla Firefox, including browsing the Internet; downloading a game from the Internet; setting preferences in Mozilla Firefox; and viewing the history of recently visited websites. Apart from this, the chapter shows you how to find information by using a search engine, and create a blog. You also learn to work with an e-mail account, which includes creating an e-mail account; logging in to the account; opening an e-mail message; reading an email message; composing a reply for an e-mail; sending an email message; printing an email message; and deleting an e-mail message. After performing all these activities, you learn to sign out from your e-mail account and quit the Mozilla Firefox window. Toward the end, the chapter discusses Internet Relay Chat, after this you learn to disconnect a connection from the Internet.

Before we start with the main topics, it is a good idea to familiarize yourself with a few basic terms associated with the Internet. The following is a short list of such terms with a brief description of each:

- **World Wide Web (WWW):** Refers to the Internet. It is a collection of online hypertext documents stored on servers around the world. To view these documents, a user has to open a corresponding website by entering the website address in the Web browser.
- **Hypertext:** Refers to a hypertext document that contains a link to another hypertext document on the Internet.
- **Hyperlink:** Refers to the link in a hypertext document, which, when clicked, takes you to some other part of the same document or to another hypertext document. In other words, it is an electronic connection between two parts of the same Web page or between two different Web pages. A hyperlink may be an underlined word, a phrase, or graphics.
- **Web Browser:** Refers to an application software that allows you to interact with the information on the Internet. The Linux operating system comes with a Web browser called Mozilla Firefox. Examples of other Web browsers are Internet Explorer, Netscape Navigator, Safari, and Opera.
- **Internet Service Provider (ISP):** Refers to the company or organization providing access to the Internet. An ISP usually has multiple access methods including dial-up, DSL, or a cable modem.

Understanding the Internet Connection

Each computer on the Internet is connected to the others, allowing you to send or receive simple textual messages or other types of information (such as graphics) from them. These messages and information are transmitted in the form of files. For information to be successfully transmitted across the Internet, the computers connected to the Internet must be able to communicate with one another. Communication between different computers is established by using the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol.

Before you start accessing the Internet, you need to have an Internet connection. Connecting to the Internet requires the use of various types of hardware and software, and familiarity with a few basic terms, which are as follows:

- **PC:** Refers to any IBM-compatible PC.
- **Modem:** Refers to a device used to transmit data over a network. There are two types of modems: external and internal. An external modem is a modem that has to be connected to your computer and telephone line with electronic sockets, whereas the internal modem comes built-in with the computer.
- **Web browser:** Refers to the software used to navigate and browse the Internet. When you install the Linux operating system on your computer, the Mozilla Firefox Web browser is installed automatically.
- **Telephone connection:** Refers to the telephone connection needed to connect to the Internet. All data and information that is transmitted over the Internet passes through the telephone line as analogue signals.
- **Internet Service Provider (ISP):** Refers to the agency that provides you the Internet connection. You can get Internet connection from any of the ISPs, such as MTNL, Airtel, or Reliance, for a certain charge.

Now that you are familiar with the hardware/software needed for an Internet connection, let's access the Internet.

Accessing to the Internet

You need to have an Internet connection to access the Internet. The connection can be subscribed from any Internet Service Provider (ISP). You need to configure the settings of your system, such as the user name and password, to access the Internet. The user name and password are provided by the ISP.

There are different ways to connect to the Internet. Some of the most common ones are described as follows:

- **Broadband Connection:** Connects your system directly to a broadband modem
- **Data Subscriber Lines (DSL):** Uses a standard telephone wire
- **Cable Modem:** Uses a co-axial cable with cable television service instead of telephone wire
- **Dial-up connection:** Uses ordinary telephone lines. A dial-up Internet connection either supports data transmission or voice call at a particular time.

Let's now learn to create an Internet connection.

Getting Connected to the Internet by using a Modem

Perform the following steps to set up a connection to the Internet:

1. *Click* the **System** menu from the top panel of the GNOME desktop. A drop-down menu appears (Fig.Mozilla-1.1).
2. *Select* the **Administration** option from the drop-down menu. A submenu appears (Fig.Mozilla-1.1).
3. *Select* the **Network** option from the submenu (Fig.Mozilla-1.1).

   The **Query** dialog box appears (Fig.Mozilla-1.2).
4. *Type,* root user's password in the **Password** text box (Fig.Mozilla-1.2).
5. *Click* the **OK** button (Fig.Mozilla-1.2).



Fig.Mozilla-1.1

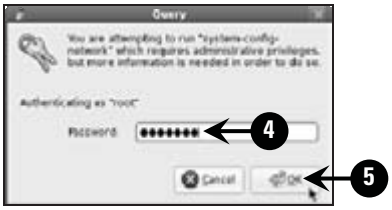


Fig.Mozilla-1.2

The **Network Configuration window** appears (Fig.Mozilla-1.3).

6. *Click* the **New** button (Fig.Mozilla-1.3).

   The **Add new Device Type** wizard appears (Fig.Mozilla-1.4).

7. *Select* the **Modem connection** option from the **Device Type** pane (Fig.Mozilla-1.4).
8. *Click* the **Forward** button (Fig.Mozilla-1.4).

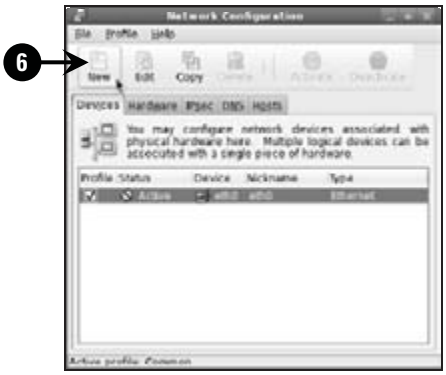


Fig.Mozilla-1.3



Fig.Mozilla-1.4

The wizard searches for the modem and the **Select Modem** wizard screen appears.

9. *Select* the following modem properties from the **Select Modem** wizard screen:
   - **Modem Device:** Lets you select the **/dev/ttyS0** option for first serial port (COM1) and the **/dev/ttyS1** option for the second serial port (COM2). This gets linked with the **/dev/modem** option**.**
   - **Baud Rate:** Refers to the rate at which a computer communicates with a modem. By default, the baud rate is 115200 bits per second.
   - **Flow Control:** Prevents excess data from being sent to the modem. You can select the software flow control option (XON/XOFF) if the hardware flow control (CRTSCTS) is not supported by the modem.
   - **Modem Volume:** Refers to the volume of sound of the modem. This property is set off by default.
   - **Use Touch Tone Dialing:** Refers to the option that allows you to set touch tone dialing on your phone. In case the phone does not support touch tone dialing, you can turn it off. In most of the cases, it is turn on.

10. *Click* the **Forward** button.
    The **Select Provider** wizard appears.
11. **Specified** the following information of the ISP in the **Select Provider** wizard:
    - **Internet Provider:** Refers to the name of the ISP
    - **Phone Number:** Refers to the phone number used to connect to the ISP
    - **Provider Name:** Refers to the name of the ISP
    - **Login Name:** Refers to the login name for the connection provided by the ISP
    - **Password:** Refers to the password of your login
12. *Click* the **Forward** button.
    The **IP Settings** wizard appears.



In case a dial up connection is already present, select the Automatically Obtain IP Address Settings check box and if the ISP has assigned a static IP address, then select the Statistically Set IP Addresses check box and enter your IP address, subnet mask, and default gateway address in the IP Settings wizard.

13. *Click* the **Forward** button.
    The **Create Dial-up Connection** window appears. This window displays the information you entered in the preceding steps.
14. *Click* the **Apply** button and then the **Forward** button.



You click the Apply button, if all the entered information is correct, otherwise, you can click the Back button to change the information.

    The **Network Configuration** window appears, displaying the new connection.
15. *Select* the **File** menu from the menu bar. A drop-down menu appears.
16. *Select* the **Save** option from the drop-down menu.
    The new configuration is saved.
17. *Select* the PPP device name from the **Network Configuration** window.
18. *Click* the **Activate** button.

Clicking the **Activate** button starts the dial-up connection to connect to an ISP.



After ISP authenticates your login ID and password, the Internet connection gets established.

Let's now learn how to connect the Internet using a broadband connection.

Getting Connected to the Internet by using a Broadband Connection

In the preceding section, you learned to connect to the Internet by using a modem. However, now-a-days dial-up modem connections are rarely used. Due to advancement in Internet technologies, these days, broadband connections are generally used as they provide a faster Internet connection compared to a modem.

In this section, we are using the Reliance broadband connection.

Perform the following steps to set up an Internet connection:

1. *Click* the **System** menu from the top panel of the desktop. A drop-down menu appears (Fig.Mozilla-1.5).
2. *Select* the **Preferences** option. A submenu appears (Fig.Mozilla-1.5).
3. *Select* the **Network Connections** option from the submenu, as shown in Fig.Mozilla-1.5:

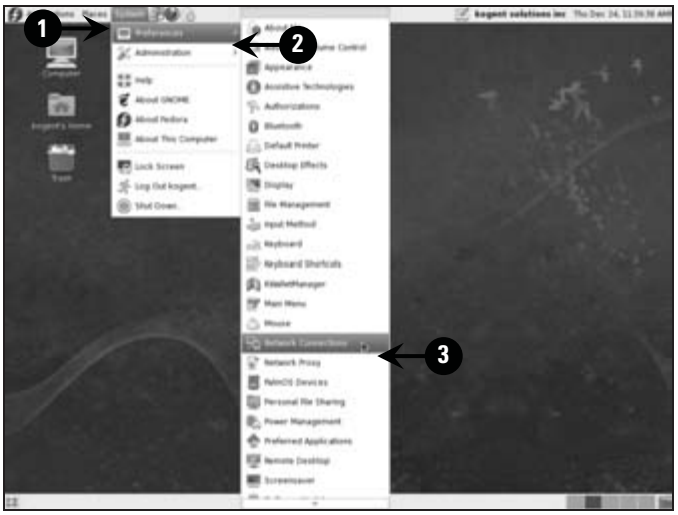


Fig.Mozilla-1.5

The **Network Connections** dialog box appears, with the **Wired** tab is activated by default (Fig.Mozilla-1.6).

4. *Select* the **Mobile Broadband** tab (Fig.Mozilla-1.6).

   A **Network Connections** window appears, displaying the **Mobile Broadband** tab as activated (Fig.Mozilla-1.7).

5. *Click* the **Add** button (Fig.Mozilla-1.7).



Fig.Mozilla-1.6



Fig.Mozilla-1.7

The **Choose a Mobile Broadband Connection** dialog box appears, where you can select the type of broadband connection you want (Fig.Mozilla-1.8).

6. *Select* the **Create a CDMA connection** radio button (Fig.Mozilla-1.8).
7. *Click* the **OK** button (Fig.Mozilla-1.9).



Fig.Mozilla-1.8



Fig.Mozilla-1.9

The **Editing CDMA connection 1** dialog box appears, as shown in Fig.Mozilla-1.10:



Fig.Mozilla-1.10

8. *Type* **Reliance Broadband Connection** in the **Connection name** text box (Fig.Mozilla-1.11).
9. *Select* the **Connect automatically** check box (Fig.Mozilla-1.11).
10. *Type* the user name in the **Username** text box (Fig.Mozilla-1.11).
11. *Type* the password beside the **Password** text box (Fig.Mozilla-1.11).



The user name and password are provided to you by the ISP.

12. *Click* the **Apply** button (Fig.Mozilla-1.11).
    The broadband connection is now established (Fig.Mozilla-1.12).
13. *Click* the **Close** button to close the **Network Connections** dialog box (Fig.Mozilla-1.12).

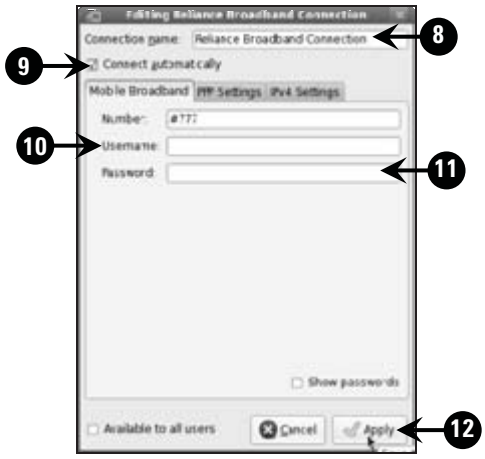


Fig.Mozilla-1.11



Fig.Mozilla-1.12

Let's now learn to create a shortcut icon for the Network Configuration window.

Creating a Shortcut to the Network Configuration window

Every time you want to connect to the Internet, you need to configure the settings in the Network Configuration window. You can access this dialog box quickly by creating a shortcut that appears as an icon at the GNOME desktop.

Perform the following steps to create a shortcut icon of the Network Configuration window:

1. *Select* the **System** menu from the top panel of the desktop. A drop-down menu appears (Fig.Mozilla-1.13).
2. *Select* the **Administration** option. A submenu appears (Fig.Mozilla-1.13).

3. *Right-click* the **Network** option, as shown in Fig.Mozilla-1.13:



Fig.Mozilla-1.13

A context menu appears (Fig.Mozilla-1.14).

4. *Select* the **Add this launcher to panel** option from the context menu, as shown in Fig.Mozilla-1.14:



Fig.Mozilla-1.14

The shortcut icon to the **Network Configuration window** is on the top panel of the desktop, as shown in Fig.Mozilla-1.15:

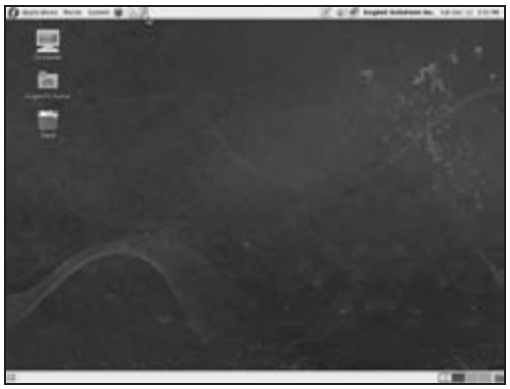


Fig.Mozilla-1.15

Next, let's briefly explore the main features of Mozilla Firefox.

Exploring the Features of Mozilla Firefox

As you know, the Linux operating system has a built-in Web browser, Mozilla Firefox. This browser provides an extension feature that allows you to modify the browser environment, such as its appearance or its settings options, according to your requirements.. Some of the main features of Mozilla Firefox are as follows:

- **Phishing Filter:** Tracks phishing. Phishing is a criminal activity in which phishers (fake websites) trick a user by fraudulently using the name, brand, or logo of a genuine website and pretending to be trustworthy entities in order to obtain sensitive information, such as the user name and password, from the user. Mozilla Firefox has filters that protect the user against the harm or damage caused by such malware practices and phishing sites.
- **Tabbed Browsing:** Allows you the facility to open more than one website in a single Mozilla Firefox window. In other words, you can open multiple tabs and switch between them easily and quickly.
- **Improved Download Manager:** Allows you to search through recently accessed files or resume downloading of files from the Internet after the system has crashed or restarted. You can also keep track of the location of downloaded files.
- **Instant Search Box:** Allows you quickly search the Internet from the Mozilla Firefox window.
- **Add-ons Manager: Allo**ws you to use add-ons or software programs to customize the Web browser window by adding enhancem**e**nts and extensions.

Let's now learn to launch the Mozilla Firefox browser.

Launching Mozilla Firefox

After the Internet connection has been established on your computer, you can start surfing the Internet by using the Mozilla Firefox Web browser. In order to use and work with the Mozilla Firefox, you need to launch the browser.

Perform the following steps to launch Mozilla Firefox:

1. *Select* the **Applications** menu from the top panel of the desktop. A drop-down menu appears (Fig.Mozilla-1.16).
2. *Select* the **Internet** option from the drop-down menu. A submenu appears (Fig.Mozilla-1.16).
3. *Select* the **Firefox Web Browser** option from the submenu (Fig.Mozilla-1.16).

The Mozilla Firefox window appears, displaying the homepage set by the user (Fig.Mozilla-1.17).



Fig.Mozilla-1.16



Fig.Mozilla-1.17

As shown in Fig.Mozilla-1.17, the interface of the Mozilla Firefox window contains various components. Let’s briefly discuss these components in the following section.

Understanding the Interface of Mozilla Firefox

After launching the Mozilla Firefox Web browser, the default homepage of the browser appears on your screen, as shown in Fig.Mozilla-1.18:



Fig.Mozilla-1.18

As you can see in Fig.Mozilla-1.18, the Mozilla Firefox window contains the following components:

A. **Title bar:** Displays the names of the currently opened website.

B. **Menu bar:** Consists of various menus, where each menu performs a specified function.

C. **Back button:** Takes you back to the previously viewed Web page.

D. **Forward button:** Lets you go to the contiguous viewed Web page, which is the Web page next to the current Web page.

E. **Recent pages:** Provides a list of recently viewed Web pages. This button is located next to the Forward button.

F. **Reload current page button:** Refreshes and loads the current page again.

G. **Home button:** Displays the default homepage.

H. **Address bar:** Refers to the space where you can type the address of the website. The Address bar is located below the menu bar.

I. **Search box:** Refers to the text box where you can enter a word or phrase to search for the corresponding websites.

J. **Most Visited:** Provides a list of frequently visited websites.

K. **Web page viewing area:** Refers to the area on the Mozilla Firefox window where you can view a Web page.

L. **Status bar:** Displays the status of the currently opened Web page when an action is being performed on the page.

Now that you have a brief idea of the various components in the Mozilla Firefox window, let's move ahead and learn to browse the Internet by using the Mozilla Firefox browser.

Browsing the Internet with Mozilla Firefox

The Linux operating system provides you with the Mozilla Firefox browser that you can use to browse the Internet. The Mozilla Firefox interface is designed to help you make your browsing experience more flexible than other Web browsers, such as Internet Explorer, due to its simple interface.

Perform the following steps to browse the Internet and visit a website by using the Mozilla Firefox Web browser:

1. Type the address of the website you want to visit, in the Address bar. In our case, we have typed www.kogentindia.com (Fig.Mozilla-1.19).
2. *Press* the **ENTER** key.

   The **kogentindia** homepage appears (Fig.Mozilla-1.19).
3. *Click* the link for which you want to open the corresponding Web page (the **Knowledge Solutions** link, in our case) (Fig.Mozilla-1.19).

The Web page corresponding to the **Knowledge Solutions link** appears (Fig.Mozilla-1.20).



Fig.Mozilla-1.19



Fig.Mozilla-1.20

After knowing how to browse the Internet and access a website with Mozilla Firefox, let's now learn to download a game.

Downloading a Game from the Internet

Many games, audio and video songs, ringtones, and software are available on the Internet, which you can easily download free of charge. If you know the name of the website where these are available, you can directly enter its name in the Address bar; otherwise, you can search the sites by using a search engine, such as Google. In this section, you learn to download a game.

Perform the following steps to download a game from the Internet:

1. *Type* the address of the website from where you want to download the game, in the Address bar. In our case, we have typed http://absolutist.com/linux/ (Fig.Mozilla-1.21).
2. *Press* the **ENTER** key.

   The homepage of the corresponding website appears (Fig.Mozilla-1.21).
3. *Click* the **Free Linux download** link of the desired game. In our case, we have selected the game **TetriBox (Linux)**, as shown in Fig.Mozilla-1.21:

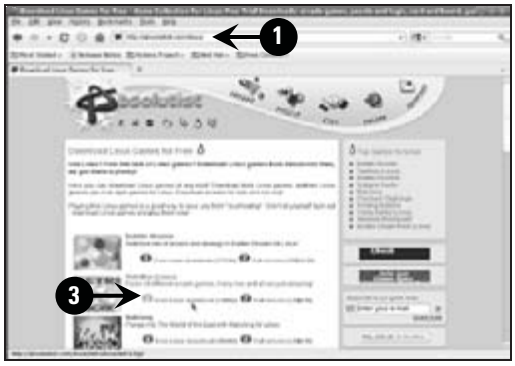


Fig.Mozilla-1.21

The **Opening tetris.tgz** dialog box appears (Fig.Mozilla-1.22).

4. *Select* the **Save File** radio button (Fig.Mozilla-1.22).
5. *Click* the **OK** button, as shown in Fig.Mozilla-1.22:



Fig.Mozilla-1.22

The **Downloads** window appears, displaying the remaining time for the game to download, the speed of the downloading process, and the transfer rate (Fig.Mozilla-1.23).

After few minutes the downloading process gets completed (Fig.Mozilla-1.24).



Fig.Mozilla-1.23



Fig.Mozilla-1.24

After learning how to download a game from the Internet, let's now find out how to customize the Mozilla Firefox window.

Setting Preferences in Mozilla Firefox

You can set various Internet options and customize the Mozilla Firefox Web browser according to your requirements. These options are present in the Firefox Preferences window. This dialog box consists of various tabs, including Main, Tabs, Content, Applications, Privacy, Security, and Advanced (Fig.Mozilla-1.26). Each tab consists of various options specific to the particular tab.

Perform the following steps to set the options of the Firefox Preferences window:

1. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Mozilla-1.25).
2. *Select* the **Preferences** option, as shown in Fig.Mozilla-1.25:



Fig.Mozilla-1.25

The Firefox Preferences window appears (Fig.Mozilla-1.26).

3. *Type* the address of the website that you want to set as your homepage, in the **Home Page** text box (Fig.Mozilla-1.26). The specified website address sets as a homepage and appears every time you launch Mozilla Firefox. In our case the website is http://www.google.co.in/



If you want to revert back all the changes and set the default preferences, then you can click on the Restore to Default button under the Main page.

The Use Current Pages button is used to set the currently opened Web page as the homepage and the Use Bookmark button is used to set a bookmarked Web page as the default homepage.

4. *Select* the **Show the Downloads window when downloading a file** check box, if you want to view the downloads in a separate window (Fig.Mozilla-1.26).

   You can also change the preferences for the installed add-ons from the Add-ons section under the Main tab of the Firefox Preferences window.

5. *Select* the **Content** tab, as shown in Fig.Mozilla-1.26:

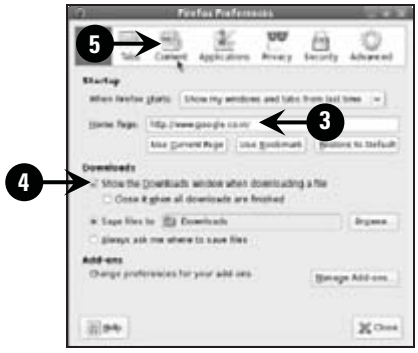


Fig.Mozilla-1.26

   The **Content** tab window appears (Fig.Mozilla-1.27).

6. *Select* the **Block pop-up windows** check box (Fig.Mozilla-1.27), if you want to block pop-ups.



The Block pop-up windows check box is selected by default.

   You can also change the color, size, and type of the font in which the content of a Web page appears, from the **Fonts & Colors** section under the **Content** tab. In addition, you can customize the language in which websites are displayed, from the **Languages** section.

7. *Select* the **Privacy** tab, as shown in Fig.Mozilla-1.27:

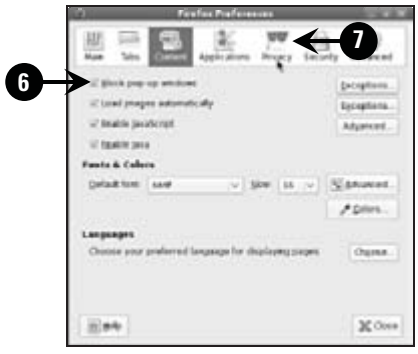


Fig.Mozilla-1.27

8. *Click* the **clear your recent history** link (Fig.Mozilla-1.28).
   The **Clear Recent History** dialog box appears (Fig.Mozilla-1.28).
9. *Click* the down arrow beside the **Time range to clear** option to set the time for deleting the history of the visited websites. A drop-down menu appears (Fig.Mozilla-1.29).
10. *Select* the **Today** option from the drop-down menu (Fig.Mozilla-1.29).



Fig.Mozilla-1.28



Fig.Mozilla-1.29

The selected option appears besides the **Time range to clear** option (Fig.Mozilla-1.30). This option deletes the history of the websites visited on the same day.



The Last Two Hours and the Last Four Hours options allow you to delete the history of the last two hours and the last four hours, respectively. The Everything options deletes the entire history.

11. *Click* the **Clear Now** button (Fig.Mozilla-1.30).
    All the history of the visited websites for a particular day is deleted and the **Clear Recent History** dialog box closes and the **Firefox Preferences window** reappears on your screen. The History section of the **Firefox Preferences window** contains the **Firefox will** drop-down menu box, which consists of the **Remember history, Never Remember History,** and **Use custom settings for History** options. You can select any one of these options according to your requirements.
12. *Click* the **Close** button in the **Firefox Preferences window** (Fig.Mozilla-1.31).



Fig.Mozilla-1.30

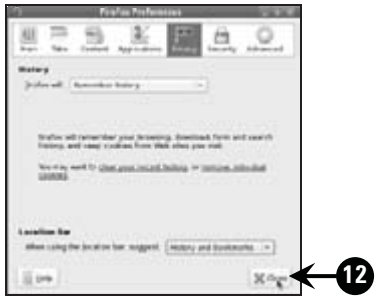


Fig.Mozilla-1.31



Just as you have set the options under the Main, Content, and Privacy tabs, you can similarly set the options under the Tabs, Applications, Security, and Advanced tabs. For example, under the Tabs tab, you can specify whether or not a new website should open as a new tab page or as a new window. The Applications tab displays the list of applications that can be run in the Mozilla Firefox window. In the Security tab, you can set the password as well as customize the way warnings are displayed. Under the Advanced tab, you can customize the options related to accessibility, browsing, and default system settings.

Let's now learn how to view the history of the websites you visit while browsing the Internet.

Viewing the History of Visited Websites

The History menu provides you the option to view the list of the websites or Web pages that you have recently visited. Using this option, you can keep track of the websites you visit.

Perform the following steps to display the history of visited websites and Web pages:

1. *Select* the **History** menu from the menu bar. A drop-down menu appears (Fig.Mozilla-1.32).
2. *Select* the **Show All History** option from the drop-down menu, as shown in Fig.Mozilla-1.32:



Fig.Mozilla-1.32

The **Library window** appears (Fig.Mozilla-1.33).

3. Select the **History** option from the left pane of the Library window (Fig.Mozilla-1.33).

   A list of recently visited websites appears in the right pane of the Library window (Fig.Mozilla-1.34). You can visit any website present in the list by double-clicking its name.
4. *Click* the **Close Window** button (Fig.Mozilla-1.34) to close the Library window.



Fig.Mozilla-1.33

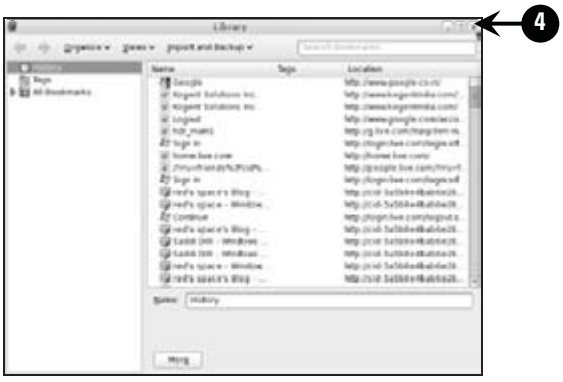


Fig.Mozilla-1.34

After viewing the history of recently viewed websites and Web pages, let's move ahead and learn to use a search engine to search for information on the Internet.

Using a Search Engine

A search engine is a type of website that is used to find information from the Internet based on the keyword or phrase entered in the search box. You may sometimes need information on a topic you do not know much about, from the Internet. In such situations, you can use search engines to find the information. The search engine available with Mozilla Firefox is Google. Other examples of search engines are Yahoo! Search and Gigablast.

Perform the following steps to search information from the Internet by using the Google search engine:

1. *Type* **www.google.co.in** in the Address bar of the Mozilla Firefox window (Fig.Mozilla-1.35).
2. *Press* the **ENTER** key.
   The homepage of the Google website appears (Fig.Mozilla-1.35).
3. *Type* a word or phrase in the search box. In our case, we have typed **IP University** (Fig.Mozilla-1.35).
4. *Click* the **Google Search** button (Fig.Mozilla-1.35).
   A Web page with a list of various links related to the typed phrase appears (Fig.Mozilla-1.36).
5. *Right-click* the required link. A context menu appears (Fig.Mozilla-1.36).
6. *Select* the **Open Link in New Tab** option from the context menu (Fig.Mozilla-1.36).

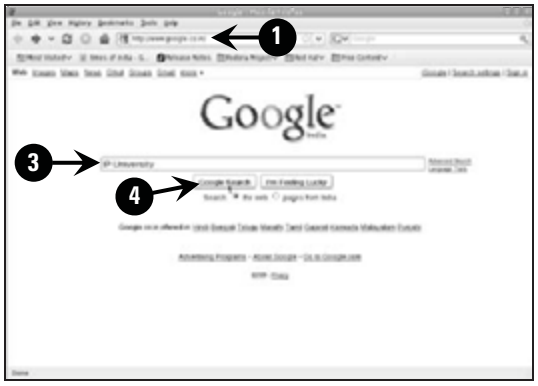


Fig.Mozilla-1.35



Fig.Mozilla-1.36

   A new tab of selected link appears (Fig.Mozilla-1.37).
7. *Select* the tab to open the Web page corresponding to the link (Fig.Mozilla-1.37).

The Web page appears (Fig.Mozilla-1.38).



Fig.Mozilla-1.37



Fig.Mozilla-1.38

You can browse through the Web page and search for the required information.

After knowing how to browse the Internet and access a website with Mozilla Firefox, let's now learn about blogs. In the following sections, you first learn to create a blog and then post a comment on the blog.

Creating a Blog

Blogs or weblogs are personal Internet journals users use to post their comments, views or any type of information. They are used to share facts, thoughts, and opinions among people or within a company.

Blogs also provide links to websites. If you want to create, submit, or post a comment in the blog of a website, you have to first become a registered member of the website.

Perform the following steps to create a blog by using the Mozilla Firefox browser:

1. *Type* the address in the **Address** bar. In our case, we have typed **www.hotmail.com**. The homepage of the Hotmail website appears (Fig.Mozilla-1.39).
2. *Type* the e-mail ID in the **Windows Live ID** text box. In our case, we have typed kogent2009@hotmail.com (Fig.Mozilla-1.39).
3. *Type* the password in the **Password** text box (Fig.Mozilla-1.39).
4. *Click* the **Sign in** button (Fig.Mozilla-1.39).

   The Web page of the corresponding e-mail ID appears (Fig.Mozilla-1.40).
5. *Click* the down arrow beside the **More** option (Fig.Mozilla-1.40). A drop-down menu appears (Fig.Mozilla-1.40).
6. *Select* the **Spaces** option from the drop-down menu (Fig.Mozilla-1.40).



Fig.Mozilla-1.39



Fig.Mozilla-1.40

The Spaces - Windows Live Web page appears (Fig.Mozilla-1.41).

7 *Click* the **Write a blog entry** link, as shown in Fig.Mozilla-1.41:



You have to create a blog first before writing a blog entry.



Fig.Mozilla-1.41

The red's space's Blog Web page appears, with various blank fields to create a blog (Fig.Mozilla-1.42).

8. *Type* the name for the blog you want to create, in the **Title (required)** text box. In our case, we have typed **Saddi Dilli** as the title of the blog (Fig.Mozilla-1.42).

9. *Click* the down arrow beside the **Category** option. A drop-down menu appears (Fig.Mozilla-1.42).
10. Select a category from the drop-down menu. In our case, we have selected the **Travel** category (Fig.Mozilla-1.42).
11. *Type* the content for the blog in the content area (Fig.Mozilla-1.43).
12. *Click* the **Publish entry** link (Fig.Mozilla-1.43).

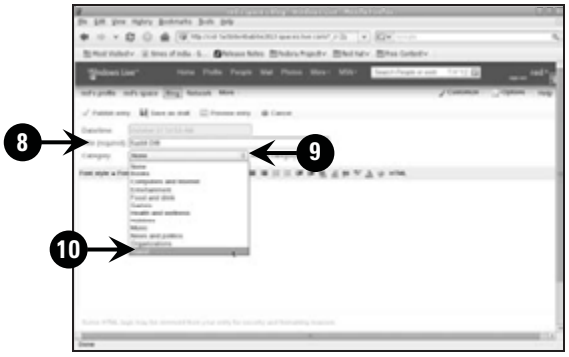


Fig.Mozilla-1.42

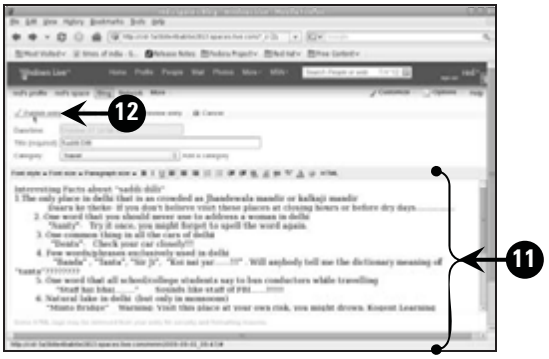


Fig.Mozilla-1.43

The created blog appears at the red's space Web page (Fig.Mozilla-1.44).

If you wish, you can also post a comment on an existing blog. In our case, we are posting a comment on the blog that we have just created (Fig.Mozilla-1.44). For this, proceed to the next step.

13. *Click* the **Add a comment** link at the bottom of the blog in the red's space Web page (Fig.Mozilla-1.45).



Fig.Mozilla-1.44

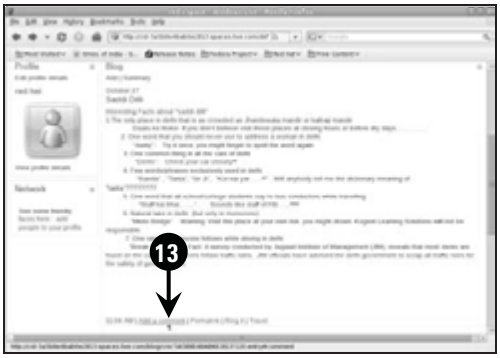


Fig.Mozilla-1.45

The Comments section appears with a text area, in which you can type your comment (Fig.Mozilla-1.46).

14. *Type* the comment in the text area (Fig.Mozilla-1.46).
15. *Click* the **Add** button (Fig.Mozilla-1.46).

Your comment appears at the bottom of the blog (Fig.Mozilla-1.47).

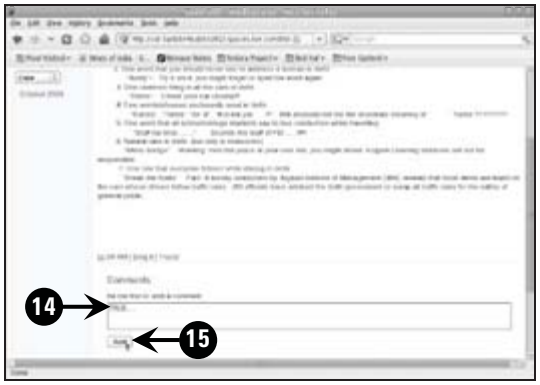


Fig.Mozilla-1.46



Fig.Mozilla-1.47

16. *Select* the **Summary** option in the **Blog** pane (Fig.Mozilla-1.48).
    A page displaying the details of the blog in a summary appears (Fig.Mozilla-1.49).



Fig.Mozilla-1.48

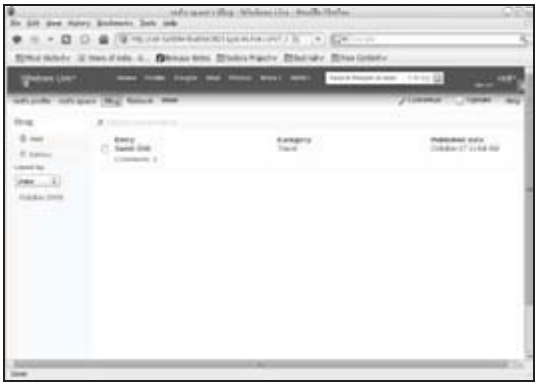


Fig.Mozilla-1.49

17. *Select* the **Sign out** option (Fig.Mozilla-1.50).

The red's space Web page appears, displaying the created blog (Fig.Mozilla-1.51).



Fig.Mozilla-1.50



Fig.Mozilla-1.51

Let's now discuss another important feature of the Internet: the e-mail.

Introducing Electronic Mail (E-Mail)

Internet facilitates faster, secure, or cheaper way to share messages from one place to another. Today, it is possible to communicate with virtually anyone around the world in an instant, irrespective of the distance, economically and efficiently, with the help of the Internet. One method of communicating on the Internet is through the e-mail. It is one of the quickest and cheapest methods of sending and receiving data or information in the form of messages to users over the Internet.

In the following sections, you find out some of the advantages of the e-mail as well as the structure the e-mail. In addition, you learn about the e-mail client and its functions.

Advantages of E-mail

The e-mail is very useful and important utility of the Internet used for exchanging information. Some of the advantages of the e-mail are as follows:

- Saves paper since the entire operation is conducted electronically
- Chances of an e-mail being misplaced is almost nil
- Takes only a few seconds to be sent and received
- Allows you to send the same e-mail to multiple recipients simultaneously
- Provides convenience to the sender as e-mail messages can be sent at any time of the day
- Provides the facility to store e-mail messages for future reference
- Allows you to send long mails, greeting cards, images, and scanned photographs at affordable prices

Let's now describe the structure of an e-mail.

Structure of an E-mail

The structure of an e-mail can be divided into four main parts: E-mail Address, E-mail Header, Body, and Attachments. The following is a description of each of these parts:

- **E-mail Address:** Refers to the e-mail address of the recipient so that the mail server can direct the mail to the correct e-mail address. Just as an address defines the location of your house, similarly, an e-mail address specifies the location of your mailbox on the Web server. An e-mail address consists of two parts, the user name and the domain name (also known as the host name). These two parts are separated by the @ (at) symbol.

  An e-mail address can contain alphabets, numbers, underscores, periods, and special characters; however, it cannot contain commas, spaces, and parentheses. The user name refers to the name with which you want to be identified by on the Internet and the domain name is the name of the location of your mailbox. The host name is usually the name of the computer owned by a company or an ISP.
- **E-mail Header:** Refers to the headings given to various components of an e-mail message. All these headers, when put together along with their content, form a complete e-mail. The header shows the name of the sender of the e-mail, its subject, and the time and date it was sent. Some of these headers are mandatory, whereas others are optional. The following is a brief description of some of the headers:
  - **Subject:** Provides a brief description or indicates the type of e-mail message being composed by the sender.
  - **From:** Specifies the e-mail address of the sender.
  - **To:** Specifies the e- mail address of the recipient.
  - **Cc:** Specifies the e-mail address (es) of those users to whom you want the specified e-mail message to be sent.
- **Body:** Refers to the main message of the e-mail composed by the user. The body of an e-mail message generally contains text or numerical data and can include alphabets, numbers, symbols, or graphics.

- **Attachment:** Refers to a file that is attached to an e-mail message. These files, such as a Calc worksheet, an Impress presentation, any kind of audio/video file, or scanned images, cannot be sent in the main body of an e-mail message.

Next, let's discuss the e-mail client.

E-mail Clients

An e-mail client is a software application helps you manage your e-mail. When a user sends you an e-mail, the e-mail is stored in the Inbox of your e-mail account. To access the e-mail messages in the Inbox, you need an e-mail client, such as Microsoft Outlook Express, Evolution Email, or Netscape. Users can also subscribe to free e-mail services, such as Hotmail or Yahoo. An e-mail client generally performs the following functions:

- Displays a list of all the e-mail messages in your mailbox in the form of message headers
- Allows you select a header of an e-mail message and read the content of the e-mail
- Allows you create and send new e-mail messages

Before you can send and receive e-mail messages to and from the users on the Internet, you need to know the fundamentals of an email-account. Therefore in the following section, we provide you a basic understanding of the e-mail account.

Working with an E-Mail Account

You need to have an e-mail account for sending or receiving e-mail messages. You can create an e-mail account by registering at any e-mail provider website. An e-mail account is the method to exchange the messages digitally. It is used to enhance the communication by sending and receiving of information in a secure manner. You can either send and receive e-mail messages from a Web browser or the e-mail clients, such as Microsoft Outlook.

In this section, you learn to create an e-mail account, log in to the account, and finally compose an e-mail message, by using the Mozilla Firefox browser. In our case, we will create the e-mail account in Gmail.

Creating an E-Mail Account

Perform the following steps to create an e-mail account in Gmail:

1. *Open* the Mozilla Firefox window.
2. *Type* www.gmail.com in the Address bar of the Mozilla Firefox window, as shown in Fig.Mozilla-1.52:



Fig.Mozilla-1.52

3. *Press* the **ENTER** key.
   The homepage of Gmail website appears (Fig.Mozilla-1.53).
4. *Click* the **Create an account** button (Fig.Mozilla-1.53).

The **Create a Google Account** Web page appears, with a form that requires information such as the user's name, e-mail ID, and location (Fig.Mozilla-1.54).

5. *Type* the first name of the user whose e-mail ID you are creating, in the **First name** text box. In our case, we have typed **Kogent** (Fig.Mozilla-1.54).
6. *Type* a last name for the e-mail ID, in the **Last name** text box. In our case, we have typed **India** (Fig.Mozilla-1.54).
7. *Type* a login name in the **Desired Login Name** text box. In our case, we have typed **kgntindia560** (Fig.Mozilla-1.54).



Fig.Mozilla-1.53

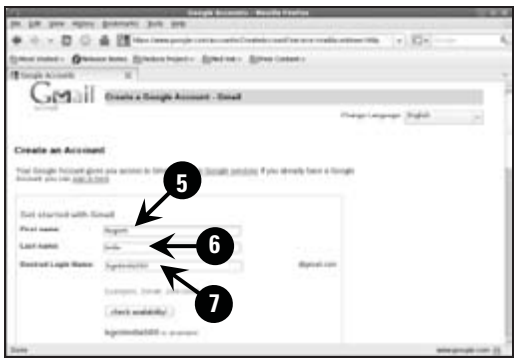


Fig.Mozilla-1.54

8. *Type* a password in the **Choose a password** text box for the account you are creating. In our case, we have typed **kogent_india10** as the password (Fig.Mozilla-1.55).
9. *Type* the password again in the **Re-enter password** text box (Fig.Mozilla1.55).
10. *Click* the down arrow beside the **Security Question** list box and select a security question. The security question is required in case you forget your password. In our case, we have selected **What is your library card number** (Fig.Mozilla-1.56).
11. *Type* the answer to the question, in the **Answer** text box (Fig.Mozilla-1.56).
12. *Type* a second e-mail address in the **Secondary email** text box. In our case we have typed Starsmoon@yahoo.com (Fig.Mozilla-1.56).
13. *Select* the desired option for the location of the user from the **Location** list box. In our case, we have selected **India** as the location (Fig.Mozilla-1.56).
14. *Type* the characters that appear in the picture, in the text box under **Word Verification** (Fig.Mozilla-1.56).

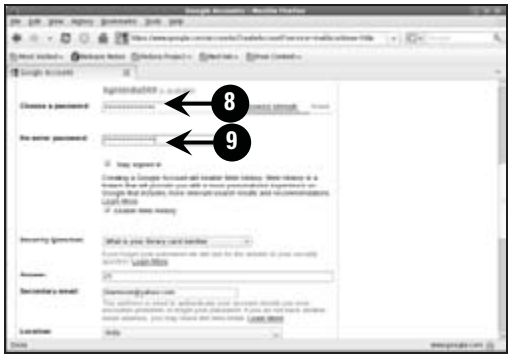


Fig.Mozilla-1.55

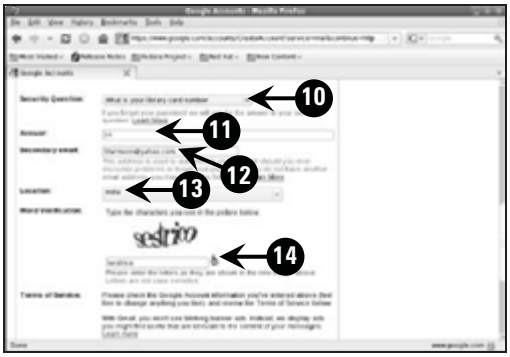


Fig.Mozilla-1.56

After providing the required information, carefully go through the terms and services to use the account.

15. *Click* the **I accept. Create my account** button (Fig.Mozilla-1.57).

Your account is created and the Gmail Web page re-appears along with a message informing you that you have successfully signed up for Gmail (Fig.Mozilla-1.58).



Fig.Mozilla-1.57



Fig.Mozilla-1.58

After successfully creating an e-mail account, let's log in to the account and check the mail.

Logging in to an E-mail Account

After creating your account in Gmail, you may want to use the account immediately. However, before you can use your Gmail account, you need to first log in to the account. After logging in, you can perform various tasks, such as check your mail or compose and send e-mail messages.

Perform the following steps to log in to an e-mail account:

1. *Open* the Mozilla Firefox window.
2. *Type* address of the website in the **Address bar** in which you have your e-mail account. In our case, we have typed www.gmail.com, as shown in Fig.Mozilla-1.59:



Fig.Mozilla-1.59

The Gmail homepage appears (Fig.Mozilla-1.60).

3. *Type* the user name of the e-mail account you want to open, in the **Username** text box at the right pane of the Gmail homepage. In our case, we have typed **kgntindia560** as the user name (Fig.Mozilla-1.60).
4. *Type* the password of the e-mail account in the **Password** text box (Fig.Mozilla-1.60). In our case, we have typed **kogent_india10** as the password (Fig.Mozilla-1.60).
5. *Click* the **Sign in** button to log in to the specified e-mail account (Fig.Mozilla-1.60).

As you click the **Sign in** button, the kgntindia560@gmail.com account opens (Fig.Mozilla-1.61).

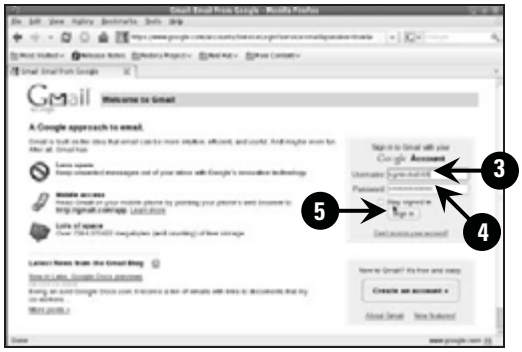


Fig.Mozilla-1.60



Fig.Mozilla-1.61

After logging in to your e-mail account, let's learn to work with an e-mail message.

Working with an E-Mail Message

After creating an e-mail account, you can perform various functions such as send and receive e-mail messages as well as compose, open, forward, and save e-mail messages.

In the following sections, you learn to open and read an e-mail as well as compose a reply for it. You also learn to send, print, and delete an e-mail message.

Opening and Reading an E-Mail Message

1. When you receive an e-mail message, you need to open and read it to know its contents. You can open an e-mail message by selecting the subject of the e-mail. In our case, we have selected **HI** (Fig.Mozilla-1.62).

The e-mail of the selected subject opens to display the entire content of the e-mail in a new Web page (Fig.Mozilla-1.63).



Fig.Mozilla-1.62



Fig.Mozilla-1.63

You can now read the contents of the e-mail (Fig.Mozilla-1.63), and, if required, compose a reply for it. Let's therefore learn to compose a reply for an e-mail in the next section.

Composing a Reply to an E-Mail Message

Certain e-mail messages that you receive require a reply from your side. In such cases, the replies can be sent as a new e-mail. In our case, we would be composing a reply to the e-mail opened in the preceding section.

Perform the following steps to compose a reply for an e-mail:

1. *Click* the **Reply** button, as shown in Fig.Mozilla-1.64:

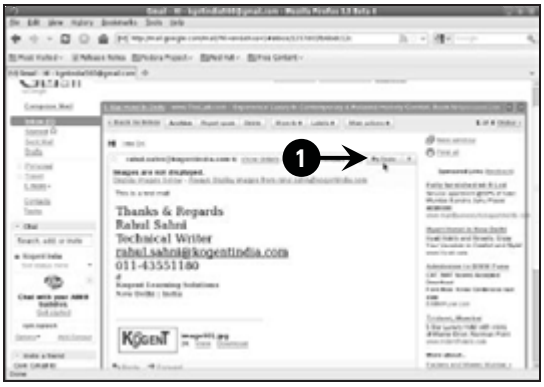


Fig.Mozilla-1.64

The **Compose Mail** Web page appears (Fig.Mozilla-1.65). The Web page contains a large text box that displays the content of the original message. The **To** text box displays the name and e-mail address of receiver of the e-mail.

2. *Click* the large text box on top of the first line of the original e-mail message so that the cursor appears at that point inside the text box (Fig.Mozilla-1.65).
3. *Type* the message you want to send as a reply. In our case, we have typed **received** (Fig.Mozilla-1.66).

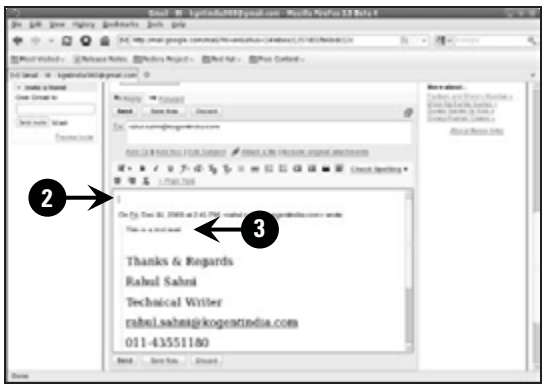


Fig.Mozilla-1.65



Fig.Mozilla-1.66

After composing the reply, the e-mail is ready to be sent. Let's learn to send an –email in the following section.

Sending an E-Mail Message

The message you compose either as a reply to a received e-mail message or as a new e-mail message is ready to be sent. In our case, we are sending the e-mail message we composed in the preceding section. To send the e-mail message, simply click the **Send** button (Fig.Mozilla-1.67).

A message appears with the message informing you that your message has been sent (Fig.Mozilla-1.68).



Fig.Mozilla-1.67



Fig.Mozilla-1.68

Let's now learn how to print an e-mail message.

Printing an E-Mail Message

To keep a record of any important e-mail, you need to take the print-out of the e-mail message. In our case, we are printing the e-mail shown in the previous section (Fig.Mozilla-1.64).

Perform the following steps to take a print-out of e-mail message:

1. *Click* the down arrow button beside the **Reply** button (Fig.Mozilla-1.69).

   A drop-down menu appears (Fig.Mozilla-1.70).
2. *Select* the **Print** option from the drop-down menu (Fig.Mozilla-1.70).

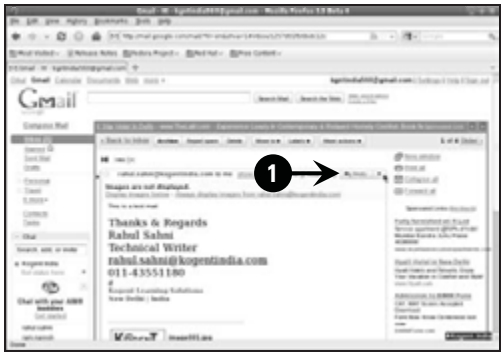


Fig.Mozilla-1.69

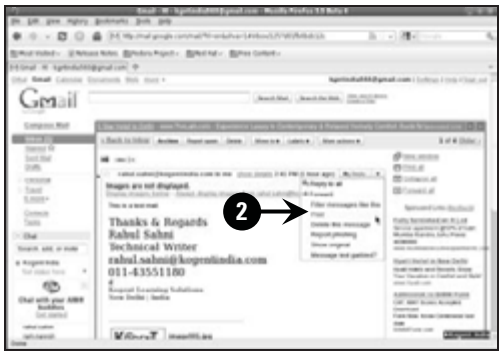


Fig.Mozilla-1.70

The **Print** dialog box appears, with the **General** tab activated by default (Fig.Mozilla-1.71).

3. *Select* the printer from the printer list. In our case, we have selected the **HP-Laserjet-3015** printer (Fig.Mozilla-1.71).

4 *Click* the **Print** button, as shown in Fig.Mozilla-1.71:



Fig.Mozilla-1.71

The currently opened e-mail message gets printed.

Next, let's learn to delete an e-mail message.

Deleting an E-mail Message

When you feel that a received e-mail message or those saved as drafts are not important, you can go ahead and delete them. Deleting old and unwanted e-mail messages regularly ensures that there is always enough space in your Inbox to receive new e-mail messages.

Perform the following steps to delete an e-mail message:

1. *Click* the **Back to inbox** link on the e-mail Web page, as shown in Fig.Mozilla-1.72:



Fig.Mozilla-1.72

The Web page displaying all the e-mail messages in the Inbox appears (Fig.Mozilla-1.73).

2. *Select* the check boxes before the e-mail messages that you want to delete (Fig.Mozilla-1.73).
3. *Click* the **Delete** button (Fig.Mozilla-1.73).

The selected email messages are move to the Trash folder (Fig.Mozilla-1.74).

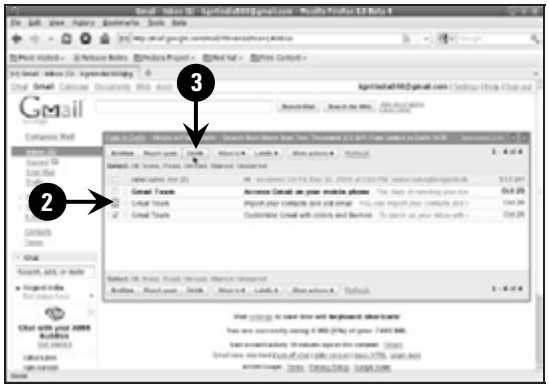


Fig.Mozilla-1.73



Fig.Mozilla-1.74

Now that you know how to perform basic functions such as read, compose, and send email-messages, let's now sign out of the e-mail account.

Signing Out of an E-mail Account

It is very important to sign out of your e-mail account after you have finished working with your e-mail messages. If you close the Web browser without signing out, a user may access and use your account. To avoid this, you must always sign out of your e-mail account before leaving your computer. For this, you can click the **Sign out** link to sign out from an account (Fig.Mozilla-1.75).

The Gmail homepage appears after you have successfully signing out of the e-mail account (Fig.Mozilla-1.76).



Fig.Mozilla-1.75



Fig.Mozilla-1.76

Now, let's learn how to quit the Mozilla Firefox window.

Quitting Mozilla Firefox

After you sign out from your e-mail account and you do not want to work on the Web browser any longer, you can quit Mozilla Firefox and close the Web browser.

Perform the following steps to quit Mozilla Firefox:

1. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Mozilla-1.77).
2. *Select* the **Quit** option from the drop-down menu (Fig.Mozilla-1.77).

The desktop appears (Fig.Mozilla-1.78).



Fig.Mozilla-1.77

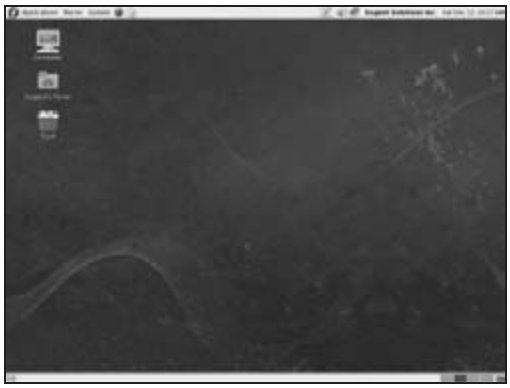


Fig.Mozilla-1.78

You have now successfully exited from Mozilla Firefox.

Along with e-mail, the Internet Relay Chat feature enables people all over the world to talk with each other over the Internet in real-time sessions in virtual rooms. Let's discuss this feature in the following section.

Introducing Internet Relay Chat

The Internet Relay Chat (IRC) feature of the Internet provides you the facility to instantly communicate with users in any location around the world through messages. Using IRC, you can converse with one or more user simultaneously in real time on the Internet. It is a great way to chat with and meet new people. Unlike e-mail where the communication is generally between people you know, an IRC chat often takes

place between strangers. Chatting takes place in an electronic chat room, which is actually a computer (a chat server) that allows multiple users to log in at the same time. When you enter a chat room, you can see the names of the users who are already there, and a window displaying a conversation messages. These lines are the messages sent by the various users who are currently logged in to the chat room. Many websites offer popular IRC chat rooms. Each chat room has a name that defines the main theme or topic of discussion among the chatters currently present in that room.

After joining a chat room, you can read the messages of other users or chatters as well as send your own. Every user has a log in name, which he or she uses for identification in the chat room. If you need privacy and want to chat with one user only, you can use a private room. Users in chat rooms usually communicate by typing messages to each other. However, recent enhancements have made voice chats and video chats possible as well. A voice chat allows two users to converse with one another, without viewing each other. To enable a voice chat, your computer must be equipped with a speaker and a microphone. In a video chat, users can chat and see each other on their computer screens at the same time.

Chatting is a popular pastime on the Internet and brings people from all around the world together. You need to have a valid e-mail ID in the websites offering the chatting facility in order to chat; however, www.indya.com does not require chatters to have e-mail IDs. Let's know more about the IRC facility by learning to chat on the www.indya.com website.

Perform the following steps to chat on the website indya.com:

1. *Open* the **Mozilla Firefox window** (Fig.Mozilla-1.79).
2. *Type* www.indya.com in the Address bar (Fig.Mozilla-1.79).
3. *Press* the **ENTER** key.

   The homepage of www.indya.com appears (Fig.Mozilla-1.80).
4. *Drag* the scroll bar (Fig.Mozilla-1.80) in case the required link cannot be seen on the window. In our case, the required link is **Chat**.
5. *Click* the **Chat** link (Fig.Mozilla-1.80).



Fig.Mozilla-1.79



Fig.Mozilla-1.80

The www.indya.com chat Web page appears, displaying the names of various chat room links (Fig.Mozilla-1.81).

6. *Click* a chat room link to enter its chat room. In our case, we click the **Friends** link, as shown in Fig.Mozilla-1.81:



Fig.Mozilla-1.81



You can enter any chat room as per your choice by selecting the desired chat room from the page.

The chat log in Web page appears (Fig.Mozilla-1.82).

7. *Select* the **HTML (For any connection)** radio button (Fig.Mozilla-1.82).
8. *Type* **guest** in the **Login ID** text box (Fig.Mozilla-1.82).
9. *Click* the **Guest Login** button, as shown in Fig.Mozilla-1.82:

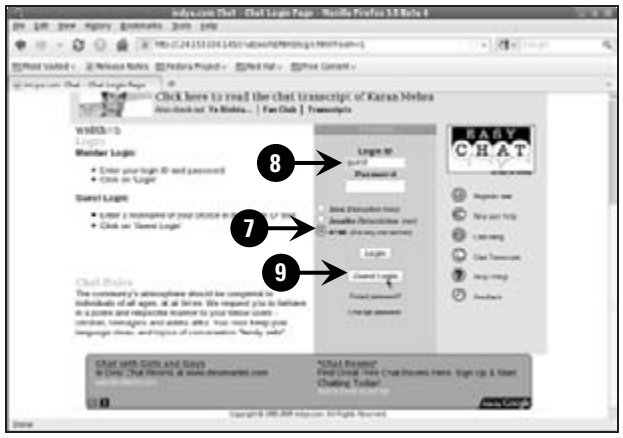


Fig.Mozilla-1.82



You can also enter the chat rooms by logging in with your e-mail ID. In our case, we are logging in as a guest user.

The **Friends** chat room window appears (Fig.Mozilla-1.83). The frame on the right side of the chat window displays the names of the chatters who are currently online and the frame on the left side displays the messages sent by the online users (Fig.Mozilla-1.83). These messages are addressed to any user who is currently logged in to this chat room.

10. *Type* **hello** in the text box beside the **Say/Reload** button (Fig.Mozilla-1.84).
11. *Press* the **ENTER** key.



Fig.Mozilla-1.83

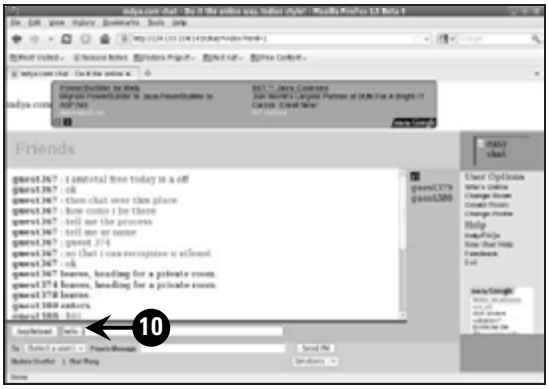


Fig.Mozilla-1.84

Your message appears in the chat window (Fig.Mozilla-1.85). The message can be seen by the other chatters in the room and can send a reply for it. In this way, you can interact with the other chatters. You can leave the chat at any point by exiting from the chat room window.

12. *Click* the **Exit** link under the **Help** category to stop chatting, as shown in Fig.Mozilla-1.85:

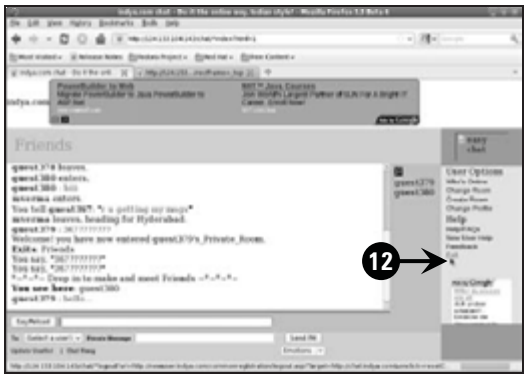


Fig.Mozilla-1.85

The registration page of the www.indya.com website appears (Fig.Mozilla-1.86).

13. *Click* the **Close Window** button to close the Mozilla Firefox window, as shown in Fig.Mozilla-1.86:



Fig.Mozilla-1.86

The Mozilla Firefox window closes.

Let's now learn how to disconnect the Internet connection.

Disconnecting from the Internet

As soon as you connect to the Internet, your dial-up connection meter presents with your ISP starts. This means that you are being charged for the period you stay connected to the Internet. Therefore, it is advisable to disconnect from the Internet when you are not using it. You can easily establish a connection again whenever you want to use the Internet.

Perform the following steps to disconnect the Internet connection:

1. *Click* the **Network Configuration** icon from the top panel of the desktop, as shown in Fig.Mozilla-1.87:

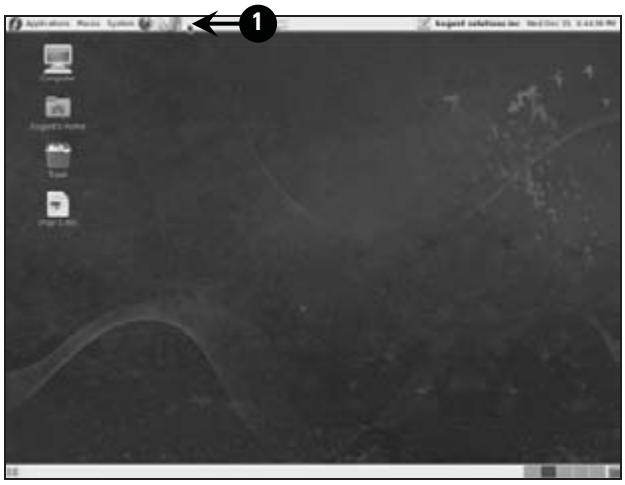


Fig.Mozilla-1.87

The **Network Configuration window** appears (Fig.Mozilla-1.88).

2. *Click* the name of your modem device to select the device (Fig.Mozilla-1.88).
3. *Click* the **Deactivate** button, as shown in Fig.Mozilla-1.88:

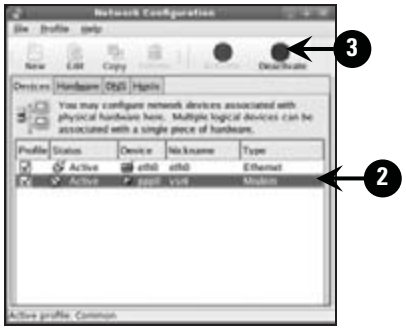


Fig.Mozilla-1.88

The Internet connection is deactivated.

With this, we come to the end of the chapter. Let's now summarize the main points of the chapter.

Summary

The chapter has introduced you to the exciting world of the Internet and the different ways to connect to it. It has then discussed the main features of the Mozilla Firefox Web browser, provided by Linux. You have learned to launch Mozilla Firefox and became familiar with its interface. In addition, you learn to

browse the Internet and access websites by using Mozilla Firefox. You have also learned to customize the Mozilla Firefox interface by setting its preferences as well as view the list of visited websites. Apart from this, you have learned about search engines and their use to navigate the vast world of the Internet and retrieve relevant information from it. Along with this, you have also learned to download games. In addition, the chapter has discussed the utility of the blog, wherein you learned to create a blog and enter a comment in an existing blog.

The chapter has also explained the use of the e-mail, and shown you how to create an e-mail account, which you used to compose and send e-mail messages. After performing these activities, you learned how to sign out of your e-mail account and also quit Mozilla Firefox. Toward the end, the chapter has discussed the IRC feature, which is used to simultaneously chat with one or more users on the Internet in real time. In the end, you learned to disconnect from the Internet.

WRITER

CHAPTER

1

Getting Started with OpenOffice.org Writer

In this Chapter:

- Opening OpenOffice.org Writer
- Exploring the OpenOffice.org Writer Interface
- Working with a Document
- Exiting OpenOffice.org Writer

When you use a computer application to create and edit text documents, it is called word processing in computer terminology. OpenOffice.org Writer (or Writer) is a part of the OpenOffice suite and contains a set of applications capable of performing a number of tasks in milliseconds. The OpenOffice suite is similar to MS Office package in the Windows platform. OpenOffice.org Writer is an application that helps you create different type of neat and attractive text documents, such as fax documents, forms, reports, and personal and professional letters in a Fedora environment easily and quickly. The most useful features of OpenOffice.org Writer include spell-checker, grammar-checker, easy insertion of text and numerous formatting features.

You can modify the text in the documents to suit your requirements with the help of OpenOffice.org Writer. In addition, it offers numerous features, such as headers, footers, footnotes, and margins that make your document more attractive and presentable. For example, the table feature of OpenOffice.org Writer enables you to arrange the information present in the document in a tabular form to facilitate easy and quick understanding of the data.

This chapter begins by showing you how to open OpenOffice.org Writer. You also explore its interface and then learn to work with a OpenOffice.org Writer document. This includes creating, saving, and closing the document. After becoming familiar with these basic functions, you learn to quit from the OpenOffice.org Writer application.

Opening OpenOffice.org Writer

To create or work in a OpenOffice.org Writer document, you need to open the OpenOffice.org Writer application. Perform the following steps to open the OpenOffice.org Writer application:

1. *Click* the **Applications** menu from the top panel appearing on the GNOME desktop (Fig.Writer-1.1). A drop-down list appears (Fig.Writer-1.1).
2. *Place* the mouse-pointer on the **Office** option in the drop-down list (Fig.Writer-1.1). A sub-menu appears (Fig.Writer-1.1).
3. *Select* the **OpenOffice.org Writer** option, as shown in Fig.Writer-1.1:



Fig.Writer-1.1

The OpenOffice.org Writer window appears, as shown in Fig.Writer-1.2:

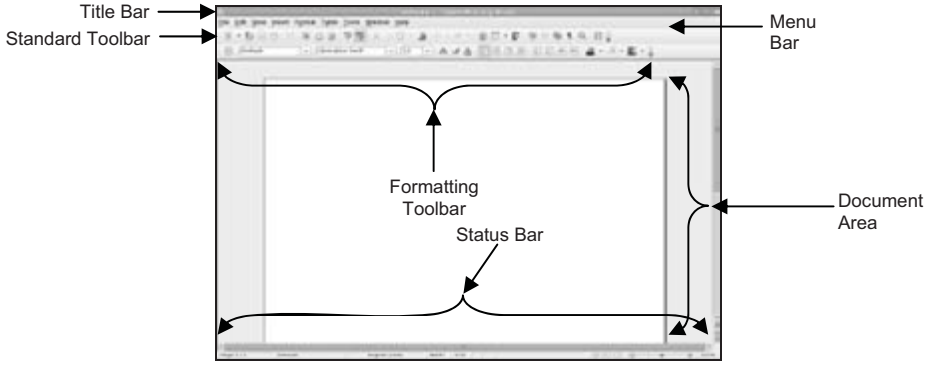


Fig.Writer-1.2

Fig.Writer-1.2 shows various components that make up the interface of the OpenOffice.org Writer application. Let's now get acquainted with the OpenOffice.org Writer interface.

Exploring the OpenOffice.org Writer Interface

When you start the OpenOffice.org Writer application, a blank document is opened by default (Fig.Writer-1.2). A document in the OpenOffice.org Writer window consists of the following components:

- **Title bar:** Allows you to view the name of an open document
- **Menu bar:** Contains menus, such as File, Edit, View, or Insert
- **Standard toolbar:** Consists of buttons to perform functions, such as open, save, copy, cut, or paste
- **Formatting toolbar:** Consists of buttons to format the text
- **Document area:** Allows you to add or edit the text
- **Status bar:** Displays information, such as the current page, zoom percentage, and selection mode

Working with a Document

The OpenOffice.org Writer application opens with a blank document by default. You can begin working in the document by inserting some text at the required position in the document. By default, the cursor appears in the top left position of the document.

Perform the following steps to insert text in a OpenOffice.org Writer document:

1. *Open* the OpenOffice.org Writer application. A blank document appears (Fig.Writer-1.3).
2. *Type* the following text in the document area of Fig.Writer-1.3:

```
This is a test file.

Requirement

Appear

Functions of the word processor can be controlled via the toolbars located at the
top of the screen. On the first row, file actions like opening and saving files can
be performed, while on the second row, changing the font, size, and style (bold,
underline, or italics) are located there.
```



Fig.Writer-1.3

Now that you have added text to the blank document, let's learn to save the document.

Saving a Document

After working on a document, you must save the document. This allows you to access the document when required. Saving an existing document after making changes in it allows you to retain the changes. In case you have created a new document and added text to it, not saving the document means the loss of the document and the text added to it. Therefore, ensure that you always save a document before closing the document and exiting the OpenOffice.org Writer application. Let's now learn to save the document created in the preceding section.

Perform the following steps to save the document:

1. *Click* the **File** menu from the Menu bar (Fig.Writer-1.4). A drop-down list appears (Fig.Writer-1.4).
2. *Select* the **Save** option from the File menu, as shown in Fig.Writer-1.4:



Fig.Writer-1.4

A **Save** dialog box appears (Fig.Writer-1.5).

3. *Type* the name of the document with which you want to save the document, in the **Name** text box. In our case, we have *typed* Test_file (Fig.Writer-1.5).
4. *Browse* in the **Places** pane for the location where you want to save the document. In our case, we have selected **Desktop** as our location (Fig.Writer-1.5).
5. *Click* the **Save** button, as shown in Fig.Writer-1.5:

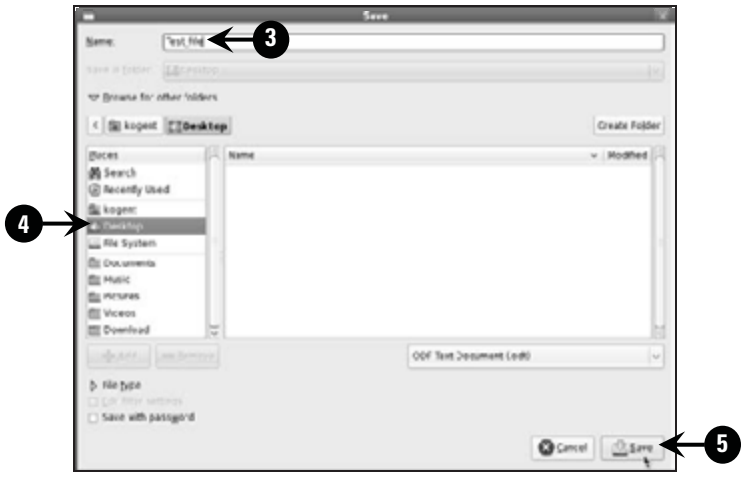


Fig.Writer-1.5

The document is saved with the specified name, which is visible in the Title bar of the document, as shown in Fig.Writer-1.6:



Fig.Writer-1.6

After saving your document, now let's move ahead and learn to close the document.

Closing a Document

When you do not want to work further on a document, you can close it after saving. In the OpenOffice.org Writer application, you can also close a document without quitting the OpenOffice.org Writer application.

Perform the following steps to close a document:

1. *Click* the **File** menu from the Menu bar (Fig.Writer-1.7). A drop-down list appears (Fig.Writer-1.7).
2. *Select* the **Close** option from the drop-down list, as shown in Fig.Writer-1.7:



Fig.Writer-1.7

When you close the document, the OpenOffice.org window appears on the screen, as shown in Fig.Writer-1.8:



Fig.Writer-1.8

In the next section, you learn to quit the OpenOffice.org Writer application.

Exiting OpenOffice.org Writer

You can quit the OpenOffice.org Writer application when you finish your work. Note that when you close a OpenOffice.org Writer document, the application itself does not close.

Perform the following steps to exit from the OpenOffice.org Writer application:

1. *Click* the **File** menu from the Menu bar (Fig.Writer-1.9). A drop-down list appears (Fig.Writer-1.9).
2. *Select* the **Exit** option from the drop-down list, as shown in Fig.Writer-1.9:



Fig.Writer-1.9

The OpenOffice.org Writer application is closed.

Let's now recap the main points of the chapter.

Summary

In this chapter, you have learned to open the OpenOffice.org Writer application and explored its interface. You have also learned to work with OpenOffice.org Writer documents and perform some important functions, such as creating, saving, and closing the document. Toward the end, you have learned to close the document and quit the OpenOffice.org Writer application.

CHAPTER

2

Editing Documents in Writer

In this Chapter:

- Opening an Existing OpenOffice.org Writer Document
- Exploring Selection Modes
- Making Changes to a Document
- Exploring the Find and Replace Feature of OpenOffice.org Writer
- Exploring the AutoCorrect Context Menu
- Working with Word Completion Features
- Working with Spelling and Grammar Checker
- Inserting Hyperlinks in Text
- Merging Documents
- Saving Changes Made to a Document

While typing a document, you may commit a number of mistakes and later on you correct them. For example a misspelled word is corrected by running the spelling checker utility, such type of corrections are referred as editing. OpenOffice.org Writer includes a host of features that help you in editing your documents, both automatically and manually. Every written document needs editing to enhance its quality. You may always want to insert or delete a word, change a phrase, or move text from one place to another. You can edit a document as you create it, or you can write it first and then revise it. You might want to edit a document that you created for one purpose but now you want to use it for a different purpose. For example, a document from the last year's marketing campaign might be edited to create a new letter for this year's campaign. In the days of handwritten and typewritten documents, people might have tolerated a spelling or grammar error because correcting these types of errors was very difficult. The documents containing errors create bad impression about its authors. Although, OpenOffice.org Writer has in-built spelling and grammar checkers that help you to eliminate misspelled words and grammatical errors. You should always read your document to catch the problems that the OpenOffice.org Writer application has not detected.

OpenOffice.org Writer allows you to insert letters, words, and lines in the text you have already entered. It even allows you to insert blank lines in your document. When making insertions, OpenOffice.org Writer allows you to either replace the existing text or make space for the new one. If you have made some unwanted changes to your document by mistake, you can use features such as Undo and Redo to correct such mistakes. The other features that are most useful for carrying and editing operations are Spelling and Grammar check, Thesaurus, and AutoCorrect.

In this chapter, you learn how to open an existing document. The chapter also describes different modes to select the text. In addition, you learn to make changes in a document. You get acquaint with the Find and Replace feature, which helps you to find a word or a phrase in your document. The chapter also describes the concepts of the AutoCorrect context menu, Spelling and Grammar check feature, Word Completion, Hyperlinks in the text, and merging the documents. In the end you learn how to save the document after the changes have been made.

Opening an Existing OpenOffice.org Writer Document

It may possible that a previous document is used in future. You can make and save changes in a previous document. You need to open an existing document to make changes in it.

Perform the following steps to open an existing document:

1. *Click* the **File** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.1).
2. *Select* the **Open** option from the File menu, as shown in Fig.Writer-2.1:

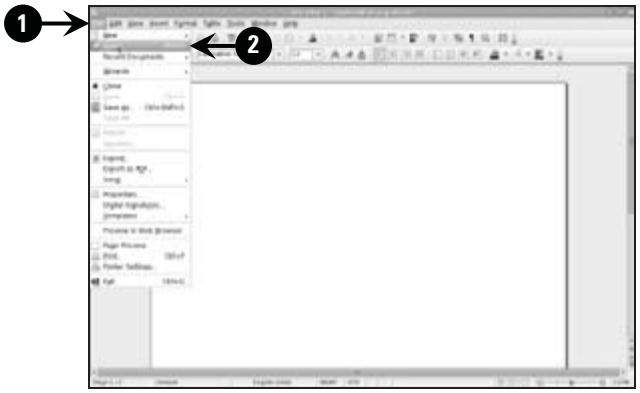


Fig.Writer-2.1

The Open dialog box appears (Fig.Writer-2.2).

3. *Browse* the location where the file is saved from the **Places** pane. In our case, we have selected **Desktop** as the location (Fig.Writer-2.2).

4. *Select* the desired file that you want to open from the **Name** pane. In our case, we have selected **Test_file.odt** (Fig.Writer-2.2).
5. *Click* the **Open** button (Fig.Writer-2.2).
6. The selected file gets open (Fig.Writer-2.3).



Fig.Writer-2.2



Fig.Writer-2.3

Let's now briefly describe different selection modes.

Exploring Selection Modes

Selection modes refer to the different ways to select text. Writer enables you to select text according to your requirement by providing the following selection modes:

- **STD:** Refers to standard mode. In this mode, the text is clicked, where you want to place the cursor and when the text is clicked then any other selection get deselected. Similarly, you can make a cell active by clicking that particular cell.
- **EXT:** Refers to extension mode. The current selection either extends or crops by clicking the text.
- **ADD:** Refers to additional selection mode resulting in multiple selection modes. This section allows you to make a new selection in addition to previous selection without deselecting it.
- **BLK:** Refers to block selection mode. You can select a block of text using the block selection mode.

Let's now learn to modify the document.

Making Changes to a Document

As you know the document created in the OpenOffice.org Writer application is editable, you can modify the document according to the requirement. You can change a document anytime after creating it. However, for this, first you need to open the desired file in which changes are to be made.

You can make several changes in a document, such as, copying and pasting, moving, and deleting the text.

Let's begin with learning to select the text.

Selecting the Text

After the creation of a document, you might want to make some changes as and when required. Before making any kind of change, you have to select the desired text that you wish to modify. For example, if you want to cut, copy, or paste the text you need to select that text first. Dragging the mouse over the portion of the text to be changed is known as selecting the text. When you select some text, such as a character, word, or paragraph, the background of the text becomes black and font color becomes white, in case of selected text area.

Perform the following steps to select the text:

1. *Place* the cursor beside the text from where you want to select the text (Fig.Writer-2.4).
2. *Drag* the mouse on the text to select it (Fig.Writer-2.5).



Fig.Writer-2.4



Fig.Writer-2.5

The required text gets selected.

Let's now learn how to copy and paste the text in Writer.

Copying and Pasting the Text

Duplicating some text and placing the duplicated text on some other place of the same document or in some other document, is known as copying the text. There are part of text or single words that are often used. You can use these commonly used words by copying and pasting them anywhere in the document. After copying the selected text, you can paste it at the desired place. The copying and pasting feature saves the time and efforts spent in retyping the text.

Let's perform the following steps to copy and paste the text:

1. *Select* the desired text, which you want to copy (Fig.Writer-2.6).
2. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.6).
3. *Select* the **Copy** option from the Edit menu, as shown in Fig.Writer-2.6:

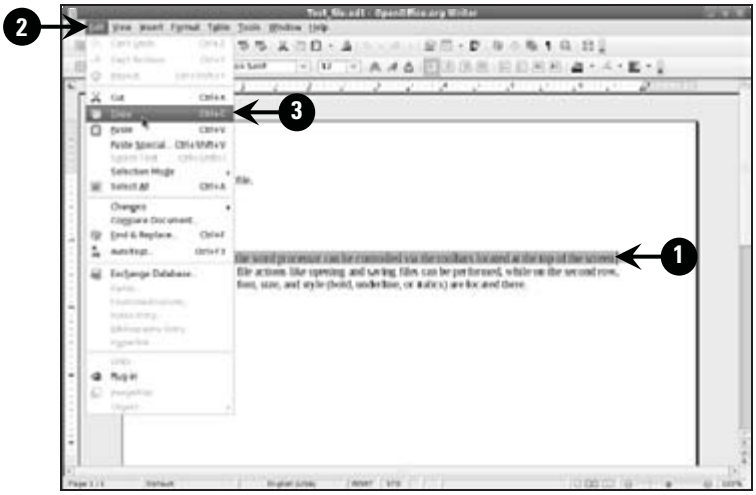


Fig.Writer-2.6

The selected text gets copied.

4. *Place* the cursor on the document where you want to paste the copied txt (Fig.Writer-2.7).

5. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.8).
6. *Select* the **Paste** option from the Edit menu (Fig.Writer-2.8).



Fig.Writer-2.7



Fig.Writer-2.8

The selected text gets pasted at the desired place, as shown in Fig.Writer-2.9:



Fig.Writer-2.9

Let's now learn how to move the text from one place to another.

Moving the Text

When you copy a portion of the text to a new place, duplicate text is placed at a specified place. However, moving the text is different from copying. On revising your document after finishing it, you may feel the need to change the arrangement of certain text. In such situations, you can move the selected text at a desired place with the use of mouse. You can move the text either within the same or the other document. In moving the text, the selected text is removed from its original place and placed at a new location. This feature can be helpful in case you have by mistake typed some text at a wrong place or in case of rearranging of text. It saves us the time of deleting the text from the wrong place and typing it again at the right place.

Perform the following steps to move the text in the same document:

1. *Select* the text that you want to move (Fig.Writer-2.10).
2. *Place* the mouse-pointer anywhere on the selected text (Fig.Writer-2.10).

3. *Drag* the selected text to the desired place (Fig.Writer-2.11).



Fig.Writer-2.10



Fig.Writer-2.11

The selected text appears at a new place.

Let's now learn how to delete the text.

Deleting the Text

In situations when you do not require certain text, you can delete that text.

Perform the following steps to delete the selected text:

1. *Select* the text that you want to delete (Fig.Writer-2.12).
2. *Press* the **DELETE** key from the keyboard. *The* selec**ted text** gets deleted (Fig.Writer-2.13).



Fig.Writer-2.12



Fig.Writer-2.13

Let's learn how to undo the last performed action or actions in a document.

Undoing a Task

Suppose, after performing some editing task you realize that you should not have done it and you may want to revert your document to previous state. For example, after deleting the sentence in the preceding section, you realize that it should not have been deleted. In such cases, you might type or copy the entire text again. You can also carry out the changes again manually if the manipulated text is small. But, in case if a large amount of text is changed it would be difficult to track it and bring out the changes. You can revert back to the previously performed action or actions in the OpenOffice.org Writer application. In such a situation, undo feature can be used when you make a mistake or you want to revert to the last version of your file. In our case, we have inserted the sentence deleted in the preceding section.

Perform the following steps to undo a task:

1. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.14).
2. *Select* the **Undo** option from the Edit menu. In our case, the **Undo: Delete 'Function....screen.'** option is selected (Fig.Writer-2.14).

The deleted sentence reappears in the document (Fig.Writer-2.15).



Fig.Writer-2.14



Fig.Writer-2.15

Let's now learn how to redo an action.

Redoing a Task

In OpenOffice.org Writer, you can also redo an action after undoing it. The Redo feature is just opposite of the Undo feature. Redoing means doing a task you have undone again. In the preceding sections, you first deleted a sentence and then brought it back using the undo feature. Suppose, you want to delete a sentence again. Instead of selecting the sentence and then deleting it, you can simply redo the delete operation. This will help you delete the sentence again with just one click.

Perform the following steps to redo an action:

1. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.16).
2. *Select* the **Redo** option from the Edit menu. In our case, the **Redo: Delete 'Function....screen.'** option is selected (Fig.Writer-2.16).

The inserted sentence deleted (Fig.Writer-2.17).



Fig.Writer-2.16



Fig.Writer-2.17

After learning how to make changes to a document, let's learn how to use the Find & Replace feature.

Exploring the Find and Replace Feature of OpenOffice.org Writer

The Find & Replace option of OpenOffice.org Writer helps you to search a particular word, phrase, or sentence in your document and replace it if required. This feature can be helpful especially if the document is large. For example, if you want to check whether you have entered the correct spelling of the name of your company in the document. Instead of going through the entire document, you can do a word search using the Find & Replace option of OpenOffice.org Writer and check each instance of the word.

Sometimes you may need to replace all occurrences of a word or a phrase in your document with one another. Changing each and every occurrence of the word manually would consume a lot of time. So, you can use the Replace All option to replace all occurrences of that word with appropriate text.

Perform the following steps to search a word:

1. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.18).
2. *Select* the **Find & Replace** option from the Edit menu, as shown in Fig.Writer-2.18:

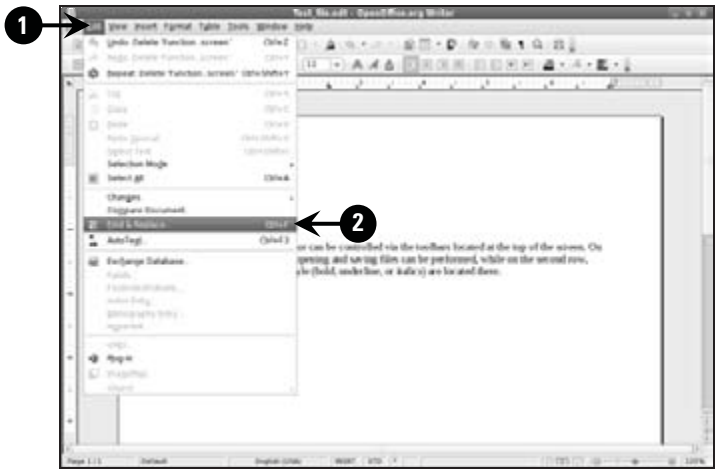


Fig.Writer-2.18



You can also open the Find & Replace dialog box by using the combination of CTRL + F keys.

A Find & Replace dialog box appears (Fig.Writer-2.19).

3. *Type* the in the combo box below the **Search for** option (Fig.Writer-2.19).
4. *Click* the **Find** button, as shown in Fig.Writer-2.19:



Fig.Writer-2.19

The first occurrence of the typed word gets selected in the document, as shown in Fig.Writer-2.20:



Fig.Writer-2.20

If you want to find more occurrences of the word, click the **Find** button until the last occurrence of the word is displayed. After the last occurrence of the word, the OpenOffice.org Writer application displays a message box (Fig.Writer-2.21), which states that the end of the document has been reached and asks whether you would like to start again. If you click the Yes button, the text search will start again from the beginning of the document. If you click the No button, the message box gets closed (Fig.Writer-2.21).

5. *Click* the **Close** button (Fig.Writer-2.22).

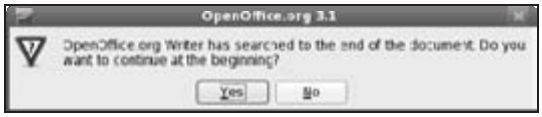


Fig.Writer-2.21



Fig.Writer-2.22

The Find & Replace dialog box gets closed.

In the following sections, you learn how to find all occurrences of a word and replace the word.

Finding All Occurrences of the Word

If you are tired of seeing the instances of a word one by one in the document, you can see all the occurrences of the instance simultaneously.

Perform the following steps to find all the occurrences of the instance:

1. *Open* the **Find & Replace** dialog box, either by *selecting* **Edit→Find & Replace** option or by using the combination **CTRL + F** key. The text **the** present in the **Search for** combo box is already selected, as shown in Fig.Writer-2.23:



Fig.Writer-2.23

2. *Type* the word to be searched. In our case, the word to be searched is on (Fig.Writer-2.24).

Since the previous text is already selected, so the current text you typed from the keyboard will automatically replace the previous text.

3. *Click* the **Find All** button (Fig.Writer-2.24).
   All the occurrences of the word gets selected in the document (Fig.Writer-2.25).



Fig.Writer-2.24



Fig.Writer-2.25

4. *Click* the **Close** button, as shown in Fig.Writer-2.26:



Fig.Writer-2.26

The Find & Replace dialog box gets closed.

Click anywhere in the document to remove the highlight from all the occurrences of the searched word.

Let's now learn how to replace the text.

Replacing the Text

Sometimes, after typing the entire document, you realize that you want to use another word in place of a particular word. You can correct this mistake by using the Find & Replace dialog box.

Perform the following steps to replace the text:

1. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.18).
2. *Select* the **Find & Replace** option from the Edit menu (Fig.Writer-2.18).
   A **Find & Replace** dialog box appears (Fig.Writer-2.27).
3. *Type* the text to be replaced in the drop-down list box below the **Search for** option (Fig.Writer-2.27).
4. *Type* the text that needs to be replaced with the previous text in the drop-down list box below the **Replace with** option (Fig.Writer-2.27).
5. *Click* the **Replace** button (Fig.Writer-2.27).

The text gets replaced and a message box appears that asks the users whether to search the text from the beginning of the document or not (Fig.Writer-2.28) It comes when searching come to the end of the document and there is no instance of the word which we have typed in the Searched for option.

6. *Click* the **No** button (Fig.Writer-2.28).



Fig.Writer-2.27



Fig.Writer-2.28



If you want to continue the search from the beginning of the document, click the Yes button.

The message box gets closed.

After exploring the find and replace feature of OpenOffice.org Writer, let's explore the AutoCorrect context menu in OpenOffice.org Writer.

Exploring the AutoCorrect Context Menu

Writer provides you with a tool that is called AutoCorrect context menu that easily correct some mistakes, such as Spellcheck, AutoCorrect, or replacement table. You can access the AutoCorrect context menu by right-clicking the misspelled word.

Let's briefly describe the options of the AutoCorrect context menu:

- **Replacement Table:** Provides you with the list of suggested words for an incorrect word. You can replace the word by clicking the selected word.
- **Spelling and Grammar:** Opens the Spelling dialog box and checks the current selection for spelling errors.
- **Add:** Enables you to add the selected word to the standard dictionary.
- **Ignore All:** Ignores all the occurrences of selected words in the current document.
- **Word is <name of language>:** Changes the language settings for selected words.
- **Paragraph is <name of language>:** Changes the language settings for the paragraph that consists of selected words.

Let's now learn how the OpenOffice.org Writer application completes the words automatically.

Working with Word Completion Features

When you type a word in the OpenOffice.org Writer document, the OpenOffice.org Writer application provides you with the suggestions to complete that word. This feature can be used only when the Word Completion option is enabled and you have typed three initial characters of the word.

Perform the following steps to access the Word Completion feature and enable automatic completion of words:

1. *Click* the **Tools** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.29).
2. *Select* the **AutoCorrect Options** option (Fig.Writer-2.29)

   The **AutoCorrect** dialog box appears.
3. *Select* the **Enable word completion** check box from the **Word Completion** tab (Fig.Writer-2.30).
4. *Click* the **OK** button (Fig.Writer-2.30).

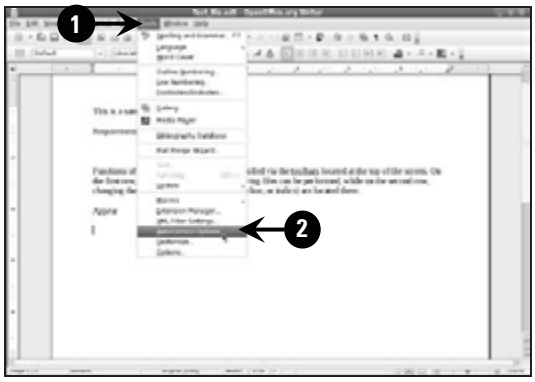


Fig.Writer-2.29

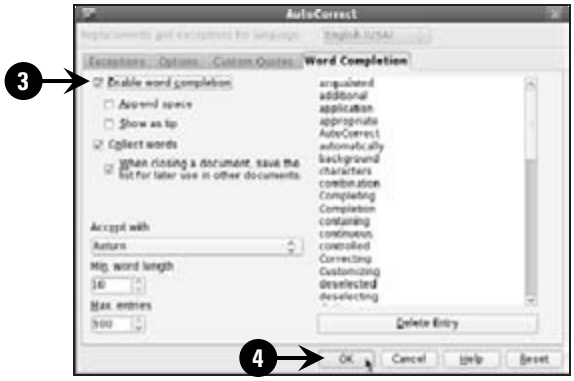


Fig.Writer-2.30

The **Word Completion** feature is enabled and the Writer application shows suggestions to complete the words.

The Collect words check box and When closing a document, save the list for later use in other documents check box, are selected by default.

Now, let's learn to accept or reject a suggestion according to the requirement. You also learn to customize the settings for the Word Completion option.

Let's begin with learning how to accept a suggestion.

Accepting a Suggestion

When you start typing the initial letters of a word, the OpenOffice.org Writer application shows you a suggestion for that word. If the suggestion provided is desired, you can accept the suggestion. In our case, the desired and suggested word, which is **containing**, are same.

Perform the following steps to accept a suggestion:

1. *Open* the document. In our case, the document is Test_file.odt (Fig.Writer-2.31).
2. *Type* the text. In our case, we have typed the letters **con** (Fig.Writer-2.31).
   The letters after **con** are selected (Fig.Writer-2.31).
3. *Press* the **ENTER** key.
   The suggested word is inserted in the document (Fig.Writer-2.32).



Fig.Writer-2.31



Fig.Writer-2.32

Let's now learn to reject a suggestion.

Rejecting a Suggestion

There are times when suggested words are not the desired words. In such cases, you can reject these suggestions by typing the word you require. In our case, the desired word is Appear and the suggested word, which is shown on the screen, is Application.

Perform the following steps to reject a suggestion:

1. *Type* the letters **App** in the document (Fig.Writer-2.33).
   The word **Application** appears selected after typing the letters, **App**, as shown in Fig.Writer-2.33:



Fig.Writer-2.33

2. *Type* the remaining letters that are **ear** (Fig.Writer-2.34).



You can also press the SPACEBAR or TAB key to remove the selected letters which come automatically.

The word **Appear** appears on the document, as shown in Fig.Writer-2.34:



Fig.Writer-2.34

Let's learn to customize the Word Completion tab in the next section.

Customizing the Word Completion Tab

The Word Completion tab is present in the AutoCorrect dialog box (Fig.Writer-2.30). You can make changes in this tab according to your requirement. The Word Completion tab comprises of the following options:

- **Enable word completion:** Lets you turn on and off the Word Completion feature.
- **Append space:** Adds space automatically after the suggested word is entered.

- **Show as tip:** Shows the suggested word as a tip instead of showing the remaining part of the word as selected.
- **Collect words:** Adds the frequently used words in the Word Completion list.
- **When closing a document, save the list for later use in other documents:** Saves the current list of words for use in other documents after closing the current document. If this option is disabled, then the current list of word will not be saved for future reference
- **Accept with:** Allows you to select the key to accept the suggested word. The Return key is selected by default.
- **Min. word length:** Provides you with the option to set the minimum number of letters that should be typed before generating suggestions for the desired word.
- **Max entries:** Allows you to select the maximum number of words that can be stored in the Word Completion list.
- **Word Completion list:** Lists the collection of words.
- **Delete entry:** Removes the selected word or words from the list.

In the following section, you learn about working with the spelling and grammar checker feature.

Working with Spelling and Grammar Checker

The text that you type in your document can have spelling and grammar errors. Whatever the reason of the errors, you have to correct them to make the text free of errors. You can carry out an automatic spelling and grammar check in OpenOffice.org Writer. In the OpenOffice.org Writer you do not have to look up for every spelling error and rectify it. OpenOffice.org Writer provides a convenient utility for checking the document for any possible spelling errors and correcting those errors.

In the following sections, you learn how to turn on the AutoSpellcheck option. You also learn how to open the Spellcheck dialog box.

Let's begin by learning to turn the AutoSpellcheck option on.

Turning the AutoSpellcheck Utility On

Not only you can correct your spelling mistakes using the built-in thesaurus of OpenOffice.org Writer but you can also turn the AutoSpellcheck utility on so that the text is automatically checked for any possible spelling errors as soon as you type it. When you turn on this utility, all the wrongly spelt words are marked with a red wavy line. This helps you identify the spelling errors easily without going through each and every word of the document.

Perform the following step to turn on the AutoSpellcheck utility:

1. *Click* the **AutoSpellcheck** button in the Standard toolbar (Fig.Writer-2.35).

   All the wrongly spelled words appear marked with red wavy lines (Fig.Writer-2.36).



Fig.Writer-2.35



Fig.Writer-2.36

Let's now learn how to start the Spellcheck.

Starting the Spellcheck

Now, that you have turned the AutoSpellcheck utility on and all the wrong words are clearly displayed as marked by red wavy lines, you can now start the Spellcheck option and correct all the spelling mistakes.

Perform the following steps to start the Spellcheck and correct the misspelled words:

1. *Place* the cursor at the beginning of the document (Fig.Writer-2.37).
2. *Click* the **Tools** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.37).
3. *Select* the **Spelling and Grammar** option (Fig.Writer-2.37).

   A **Spelling: English (USA)** dialog box appears. It shows the suggestion of the misspelled words. In our case, we have selected the first suggested word (Fig.Writer-2.38).



Fig.Writer-2.37



Fig.Writer-2.38

4. *Click* the **Change** button (Fig.Writer-2.39).

   The misspelled word gets correct in the document and the next word, which is not present in the dictionary is shown in the Suggestions list box. In our case, the corrected word is **requirement** (Fig.Writer-2.40).
5. *Click* the **Ignore All** button, since the word **toolbars** is correct in our case (Fig.Writer-2.40).

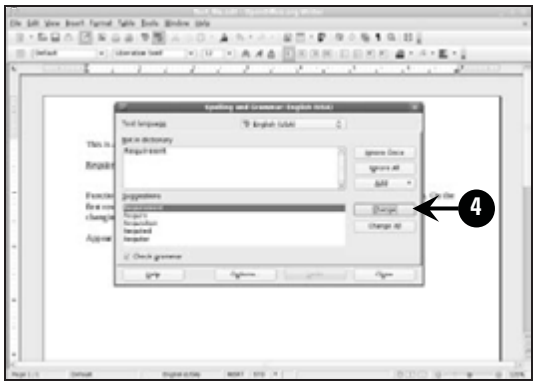


Fig.Writer-2.39

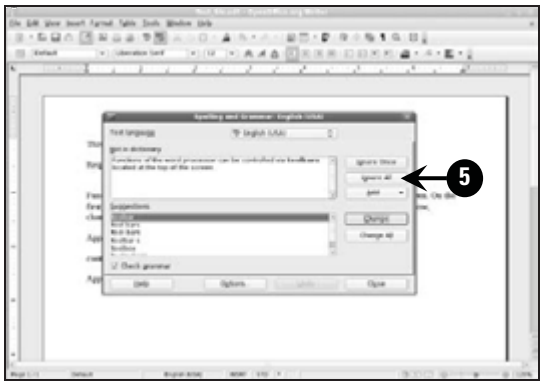


Fig.Writer-2.40

A message box appears after correcting all the misspelled words in the document. The message in the box states that the spellcheck is complete (Fig.Writer-2.41).

6. *Click* the **OK** button, as shown in Fig.Writer-2.41:



Fig.Writer-2.41

The Spellcheck dialog box gets close.



If you want to close the Spellcheck dialog box at anytime before correcting all the misspelled words, you can click the Close button.

Let's now learn how to insert a hyperlink in the document.

Inserting Hyperlinks in Text

A hyperlink is a text or a graphic that is when clicked, opens a linked document or the location in the same document.. OpenOffice.org Writer supports the use of hyperlinks in documents. You can convert some text or graphics in your document to a hyperlink and link it to any other location, so that whenever a hyperlink is clicked, the concerned location opens.

Perform the following steps to insert a hyperlink:

1. *Select* the text to be converted to a hyperlink (Fig.Writer-2.42).
2. *Click* the **Insert** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.43).
3. *Select* the **Hyperlink** option (Fig.Writer-2.43).



Fig.Writer-2.42



Fig.Writer-2.43

A Hyperlink dialog box appears (Fig.Writer-2.44).

4. *Type* the **URL** address of the Web page to be linked with the hyperlink in the combo box beside the **Target** option. In our case, the URL address is **www.google.co.in** (Fig.Writer-2.44).
5. *Type* the text that is to be converted to hyperlink, in the text box beside the **Text** option (Fig.Writer-2.44).
6. *Type* the name of the link in the text box beside the **Name** option (Fig.Writer-2.44).
7. *Click* the **Apply** button to create hyperlink (Fig.Writer-2.44).
8. *Click* the **Close** button (Fig.Writer-2.45).



Fig.Writer-2.44

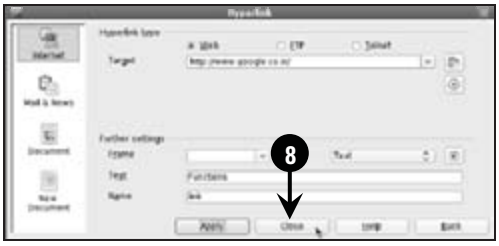


Fig.Writer-2.45

The Hyperlink dialog box gets closed and the selected text is converted to a hyperlink. The color of the selected text changes to blue and it becomes underlined indicating that it is a hyperlink, as shown in Fig.Writer-2.46:



Fig.Writer-2.46

Now, that you have created the hyperlink (Fig.Writer-2.46), let's learn how to open the corresponding website using that hyperlink.

Perform the following steps to open the Web page using the hyperlink:

1. *Right-click* the hyperlink. A context menu appears (Fig.Writer-2.47).
2. *Select* the **Open Hyperlink** option, as shown in Fig.Writer-2.47:



Fig.Writer-2.47

The corresponding Web page appears. In our case, the Web page is the Google homepage, as shown in Fig.Writer-2.48:



Fig.Writer-2.48



You can also open the corresponding Web page using the hyperlink by the key combination of CTRL+click.

In the following section, you learn how to merge different documents.

Merging Documents

Suppose that you have created two documents. But after finishing your documents, you feel that you could have created a single document instead of two separate documents consisting of same information. Since, it would be easier to access and work with the information in a single document. In such situations, you can merge multiple documents in the OpenOffice.org Writer.

Perform the following steps to merge the document:

1. *Open* the file in which you want to merge the content. In our case, the opened file is Test_file.odt, as shown in Fig.Writer-2.49:



Fig.Writer-2.49

2. *Press* the **ENTER** key. The cursor appears at the new position (Fig.Writer-2.50).

3. *Click* the **Insert** menu from the Menu bar. A drop-down menu appears (Fig.Writer-2.51).
4. *Select* the **File** option (Fig.Writer-2.51).



Fig.Writer-2.50



Fig.Writer-2.51

An **Insert** dialog box appears (Fig.Writer-2.52).

5. *Browse* to the location where the file to be merged is stored from the **Places** pane. In our case, the location is **Desktop** (Fig.Writer-2.52).
6. *Select* the file to be merged from the **Name** pane. In our case, the name of the file is **merge.odt** (Fig.Writer-2.52).
7. *Click* the **Open** button (Fig.Writer-2.52).

The contents of the merge.odt file are inserted in the Test_file.odt (Fig.Writer-2.53).

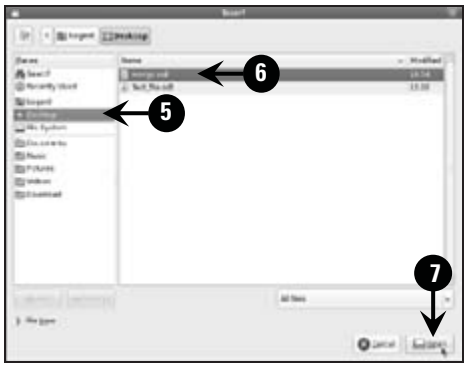


Fig.Writer-2.52



Fig.Writer-2.53

Let's now learn to save the modified document.

Saving Changes Made to a Document

After all the required modifications you made to your document, it is appropriate to save the changes. When you work in a document, you should save the changes regularly at short intervals. In case of a sudden power failure or the computer turning off due to some other reason, the unsaved data is lost and you lose all your modified current data.

Perform the following steps to save the changes made to the document:

1. *Click* the **File** menu from the Menu bar. A drop-down list appears (Fig.Writer-2.54).
2. *Select* the **Save** option from the drop-down list, as shown in Fig.Writer-2.54:



Fig.Writer-2.54

The modified file gets saved.



You can also save the document using the combination CTRL+S keys.

With this we come to the end of the chapter. Let's quickly summarize the main ideas of the chapter in the following section.

Summary

In the chapter, you learned to open an existing document in the OpenOffice.org Writer application. You explored different selection modes. Further, you also learned how to select, copy, move, and delete the text in a document. You also learned how to undo and redo the task. In addition, you get acquainted with the Find & Replace feature, AutoCorrect menu, Word Completion feature, and Spell-checking and Grammar-checking utility. Further, you learned to insert hyperlinks in the document and merging multiple documents. After making all the changes, you learned how to save the changes in a document.

CHAPTER

3

Formatting the Document

In this Chapter:

- Setting the Page margins
- Describing Headers and Footers
- Working with a Table
- Formatting Text in a Document
- Working with Graphics
- Wrapping the Text around Graphic
- Working with Templates
- Designing Documents using Template
- Navigating the Document
- Applying Styles
- Previewing the Document
- Printing a Document

There are different formatting features available in the OpenOffice.org Writer application. This OpenOffice application provides you with different formatting tools through which you can give the desired layout to your document. You can format the document with the help of the commands provided in the Format menu. This menu is located in the Menu toolbar. A document can be formatted by specifying its font family, size, and other formatting, such as bold or italic for individual instances.

A document can be made more attractive and readable with the use of styles. In OpenOffice.org Writer documents, styles refer to different formats that can be applied to a document. There is no need to change various font properties, such as, color, typeface, or size individually. You can simply choose any style and all the element sets in the style are automatically applied to the selected text.

In this chapter, you learn to set margins for pages in your document. You explore headers and footers and learn how to insert them in your document. You learn to work with a table. You also learn to format the text by changing its size, typeface, and font type. You learn how to highlight the text, align it, and apply bullets and numbers to the selected text. You also learn how to add pictures and modify them according to the requirement. You learn how to move a graphic, apply border and shadow to it, and also wrap the text around it. Next, you learn to generate templates and using them in a document. Further, you explore navigator and the style utility present in OpenOffice.org Writer. Finally, you learn how to preview and print the document.

Setting the Page margins

Page margins are the empty spaces along the left, right, top, and bottom edges of a page. Headers and footers are located in the top and bottom margins of each page. A document looks more organized when its margins are properly set. The default margins are appropriate but you may require different margin settings for your document. The OpenOffice.org Writer application allows you to customize margin settings for your document.

Perform the following steps to set margins for a page:

1. *Click* the **Format** menu from the Menu bar. A drop-down list appears (Fig.Writer-3.1).
2. *Select* the **Page** option from the drop-down list (Fig.Writer-3.1).

   A **Page Style:Default** dialog box appears. By default, the **Organizer** tab is selected (Fig.Writer-3.2).
3. *Select* the **Page** tab (Fig.Writer-3.2).



Fig.Writer-3.1



Fig.Writer-3.2

The **Page** tab gets selected (Fig.Writer-3.3).

4. *Click* the up or down arrows beside the **Left** spin-box in the Margins section, to increase or decrease the page margin. In our case, we have selected the default value (Fig.Writer-3.3).

5. *Click* the up or down arrows beside the **Right** spin-box in the Margins section, to increase or decrease the page margin. In our case, we have selected the default value (Fig.Writer-3.3).
6. *Click* the up or down arrows beside the **Top** spin-box in the Margins section, to increase or decrease the page margin. In our case, we have selected the default value (Fig.Writer-3.3).
7. *Click* the up or down arrows beside the **Bottom** spin-box in the Margins section, to increase or decrease the page margin. In our case, we have selected the default value (Fig.Writer-3.3).
8. *Click* the **OK** button, as shown in Fig.Writer-3.3:

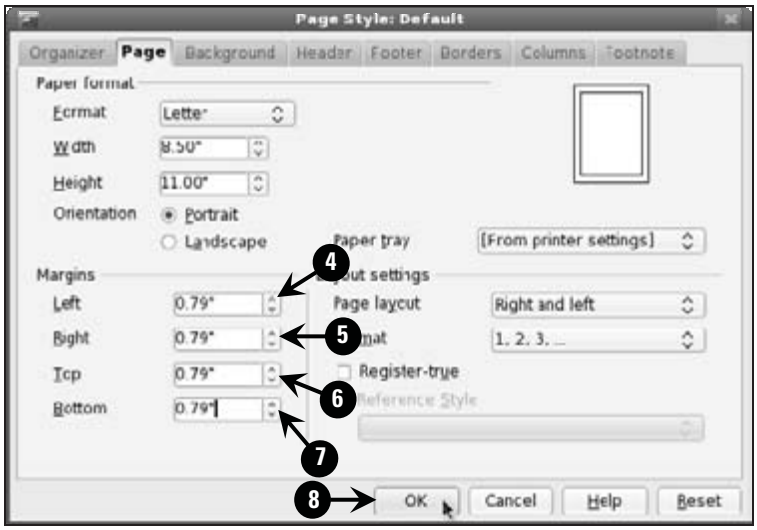


Fig.Writer-3.3

The default settings for page margins are saved.

Let's now explore header and footer, in the next section.

Describing Headers and Footers

In some situations, you might need to include some vital information about your document either at the top of a page or at the bottom, or a combination of both. You can easily provide information regarding the document title, page numbers, creation date, and author at the top or bottom of your document body, if you place it in a header or footer outside the document body. This information will always retain its placement, no matter how many times you edit the content of your document.

Let's now learn how to insert header in the document.

Adding a Header

A header is a section that appears at the top of each page between the top margin and the first line of text. Any text or graphics you insert in a header appear at the top of every page in the document. Typical header contents include the document's title and author, and the created or modified date of the document.

Perform the following steps to insert a header:

1. *Click* the **Insert** menu from the Menu bar. A drop-down list appears (Fig.Writer-3.4).
2. *Place* the mouse-pointer on the **Header** option. A submenu appears (Fig.Writer-3.4).
3. *Click* the **Default** option (Fig.Writer-3.4).

   The cursor appears in the header of the document (Fig.Writer-3.5).



Fig.Writer-3.4



Fig.Writer-3.5

You can insert a suitable text such as title in the document header. Now, let's learn to add footer.

Adding a Footer

Footer is a section that appears at the bottom of each page. Similar to a header, you can insert anything in the footer. This information is shown at the bottom of every page in the document. Footer contents include the page number and document filename.

Let's perform the following steps to insert footer:

1. *Click* the **Insert** menu from the Menu bar. A drop-down list appears (Fig.Writer-3.6).
2. *Place* the mouse-pointer on the **Footer** option. A submenu appears (Fig.Writer-3.6).
3. *Click* the **Default** option (Fig.Writer-3.6).

   The cursor appears in the footer of the document (Fig.Writer-3.7).



Fig.Writer-3.6

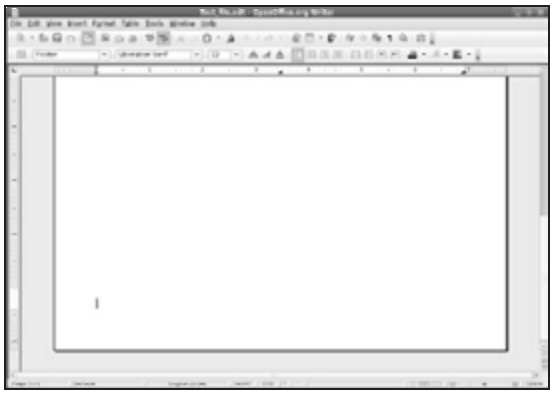


Fig.Writer-3.7

You can insert a suitable text such as, page number in the document footer. Let's now learn to insert a table.

Working with a Table

A table is a grid of cells with individual cells occurring at the intersection of corresponding rows and columns. In table, we represent data in tabular format. These are used for a variety of tasks, from presenting numerical data to creating unique layouts. You can use tables to present data in an organized fashion. For example, you can add a table to your document to display a list of items or to present data in a category.

Perform the following steps to insert a table:

1. *Click* the **Insert** menu from the Menu bar. A drop-down list appears (Fig.Writer-3.8).
2. *Click* the **Table** option from the Insert menu, as shown in Fig.Writer-3.8:



Fig.Writer-3.8

An **Insert Table** dialog box appears (Fig.Writer-3.9).

3. *Type* the name of the table in the **Name** text box. In our case, we use the default name for table, which is Table1 (Fig.Writer-3.9).
4. *Click* the up or down arrow beside the **Columns** spin-box to increase or decrease the number of columns. In our case, number of columns are **2** (Fig.Writer-3.9).
5. *Click* the up or down arrow beside the **Rows** spin-box to increase or decrease the number of rows. In our case, number of rows are **3** (Fig.Writer-3.9).
6. *Click* the **OK** button (Fig.Writer-3.9).

   A table with specified number of rows and columns is inserted in the document (Fig.Writer-3.10).



Fig.Writer-3.9



Fig.Writer-3.10

Let's now learn to insert rows in a table.

Inserting a Row in the Table

During insertion of data in the table, you might need more rows in a column to finish your work. In such cases, you can add any number of required rows in the table.

Perform the following steps to insert a row in a table:

1. *Right-click* the cell on which cursor is placed. A context menu appears (Fig.Writer-3.11).
2. *Place* the cursor on the **Row** option. A submenu appears (Fig.Writer-3.11).
3. *Click* the **Insert** option, as shown in Fig.Writer-3.11:

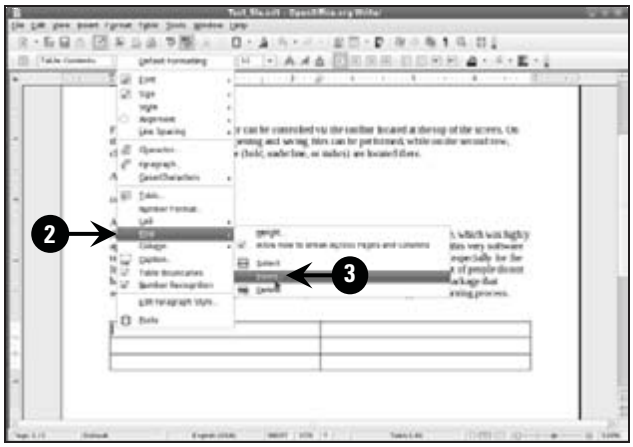


Fig.Writer-3.11

An **Insert Rows** dialog box appears (Fig.Writer-3.12).

4. *Click* the up or down arrows beside the **Number** spin box to add the required number of rows. In our case, we have selected the number of rows as two (Fig.Writer-3.12).
5. *Select* the radio button beside the **Before** or **After** option in the **Position** pane according to the requirement. In our case, we select **After** radio button (Fig.Writer-3.12).
6. *Click* the **OK** button (Fig.Writer-3.12).

The specified number of rows is added (Fig.Writer-3.13)

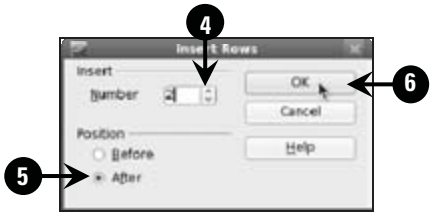


Fig.Writer-3.12



Fig.Writer-3.13

Now, the number of rows is five (Fig.Writer-3.13).

Let's now learn how to insert a column in a table.

Inserting a Column in the Table

You can also insert any number of columns as per your requirement at the time of entering data in the table.

Perform the following steps to insert a column:

1. *Right-click* the cell on which cursor is placed. A context menu appears (Fig.Writer-3.14).

2. *Place* the cursor on the **Column** option. A submenu appears (Fig.Writer-3.14).
3. *Click* the **Insert** option, as shown in Fig.Writer-3.14:

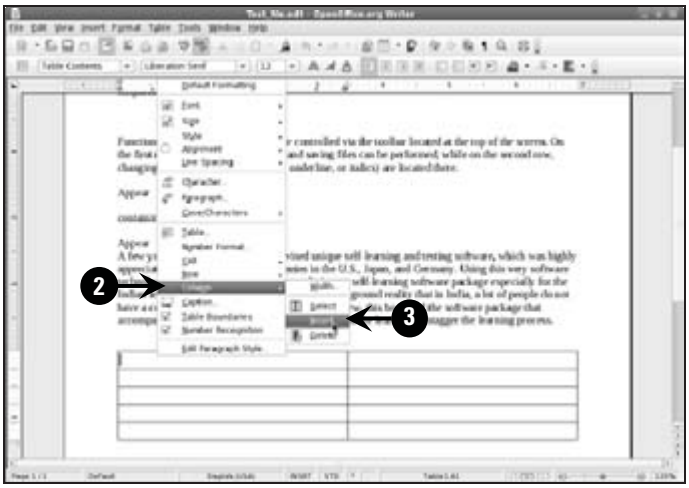


Fig.Writer-3.14

An **Insert Columns** dialog box appears (Fig.Writer-3.15).

4. *Click* the up or down arrow beside the **Number** spin box to add the required number of columns. In our case, we have selected the number of columns as three (Fig.Writer-3.15).
5. *Select* the radio button beside the **Before** or **After** radio button in the **Position** group according to the requirement (Fig.Writer-3.15). In our case, we have selected the Before radio button.
6. *Click* the **OK** button (Fig.Writer-3.15).

   The specified number of rows is added (Fig.Writer-3.16).



Fig.Writer-3.15



Fig.Writer-3.16

Now, the number of columns is five (Fig.Writer-3.16).

Let's now learn to delete a row in a table.

Deleting a Row from the Table

You can delete any number of rows as required. For deleting a row, perform the following steps:

1. *Select* the row that you want to delete, as shown in Fig.Writer-3.17:



Fig.Writer-3.17

2. *Right-click* the row. A context menu appears (Fig.Writer-3.18).
3. *Place* the cursor on the **Row** option. A submenu appears (Fig.Writer-3.18).
4. *Click* the **Delete** option, as shown in Fig.Writer-3.18:

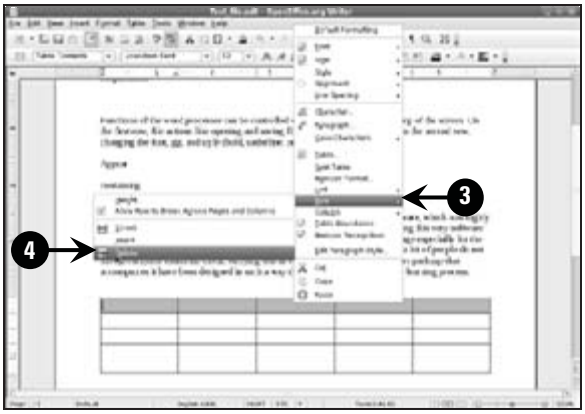


Fig.Writer-3.18

The selected row gets deleted, as shown in Fig.Writer-3.19:



Fig.Writer-3.19

Let's now learn to delete a column from a table.

Deleting a Column from the Table

You can also delete a column from the table if you do not need it. Let's perform the following steps to delete a column:

1. *Select* the column that you want to delete (Fig.Writer-3.20).
2. *Right-click* the column. A context menu appears (Fig.Writer-3.20).
3. *Place* the cursor on the **Column** option. A submenu appears (Fig.Writer-3.21).
4. *Click* the **Delete** option (Fig.Writer-3.20).



Fig.Writer-3.20

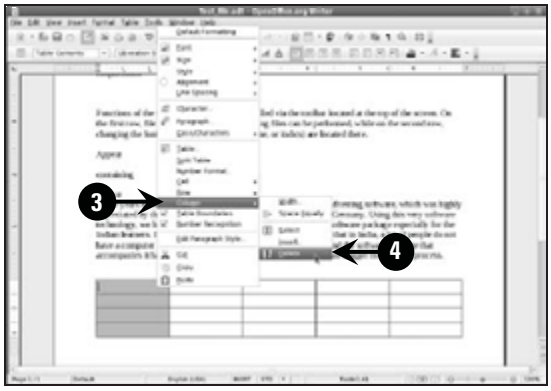


Fig.Writer-3.21

The selected column gets deleted, as shown in Fig.Writer-3.22:



Fig.Writer-3.22

Let's now learn how to format the text.

Formatting Text in a Document

A document in the OpenOffice.org Writer can be created in a number of formats. You can format the text in your document to make it readable and attractive.

In the following sections, you learn to work with the font of the text. You also learn how to highlight and align the text in the document. You also learn to apply bulleted and numbered lists to the paragraphs. Let's begin with working with the font.

Working with the Font of the Text

Font is a collection of characters in a particular typeface. The appearance of the text can be modified according to the requirement. You can change font of the text, size of the text, and color of the text. You can also apply text effects. Font styles include boldface, italic, and underline.

Perform the following steps to change the font:

1. *Select* the text that needs a font change (Fig.Writer-3.23).
2. *Click* the **Format** menu from the Menu bar. A drop-down list appears (Fig.Writer-3.24).
3. *Click* the **Character** option in the drop-down list (Fig.Writer-3.24).



Fig.Writer-3.23



Fig.Writer-3.24

A **Character** dialog box appears (Fig.Writer-3.25).

4. *Select* the font type from the **Font** list-box. In our case, we have selected the **Century Schoolbook L** type (Fig.Writer-3.25).
5. *Select* the typeface (Italic, Roman, Bold, or Bold Italic) from the **Typeface** list-box. In our case, we have selected the default typeface that is **Italic** (Fig.Writer-3.25).
6. *Select* the size from the **Size** text box. In our case, we have selected the text size as **20** for the selected text (Fig.Writer-3.25).
7. *Click* the **OK** button (Fig.Writer-3.25).

   The font of the selected text gets changed (Fig.Writer-3.26).

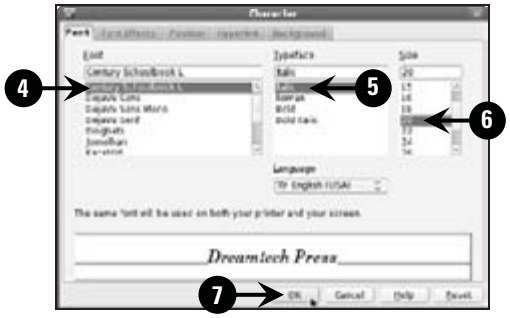


Fig.Writer-3.25



Fig.Writer-3.26

Let's now learn to highlight the text.

Highlighting the Text

There are certain portions of text that needs to be emphasized. To focus on these texts, the OpenOffice.org Writer application provides you with the feature of highlighting.

Perform the following steps to highlight the text:

1. *Select* the text that you want to highlight (Fig.Writer-3.27).
2. *Click* the **Highlighting** button in the **Formatting** bar (Fig.Writer-3.27).
   The selected text gets highlighted (Fig.Writer-3.28).



Fig.Writer-3.27



Fig.Writer-3.28

Now, let's learn the alignment of text.

Aligning the Text

Alignment is the arrangement of whole data in the document including the position of text lines or a paragraph. In OpenOffice.org Writer, there are four different ways to align the data in your document. The alignment position includes left, right, centered, and justified alignment. Let's briefly describe these four alignment options:

- **Left:** Aligns the paragraph to the left margin of the page
- **Right:** Aligns the paragraph to the right margin of the page
- **Centered:** Sets the working area at the center of the page
- **Justified:** Aligns the text of the document to the left and right margins

Applying Bullets and Numbers to Text

While working in a document you would require highlighting some key areas of the text in the form of lists that would summarize the key points. In this case, the OpenOffice.org Writer application provides you with the option of bulleted and numbered lists. Bulleted lists contain various styles of bullets including solid small circle, arrow, or Solid large circle, while numbered lists contain numbers.

Perform the following steps to apply the bullets:

1. *Select* the paragraph to which you wish to apply the bullets (Fig.Writer-3.29).
2. *Click* the **Format** menu from the Menu bar. A drop-down list appears (Fig.Writer-3.30).
3. *Click* the **Bullets and Numbering** option in the drop-down list (Fig.Writer-3.30).



Fig.Writer-3.29



Fig.Writer-3.30

A **Bullets and Numbering** dialog box appears (Fig.Writer-3.31).

4. *Select* the desired bullet type from the **Selection** group (Fig.Writer-3.31). In our case, we have selected check mark bullets.
5. *Click* the **OK** button (Fig.Writer-3.31).

   The selected bullet type is applied to the paragraph (Fig.Writer-3.32).

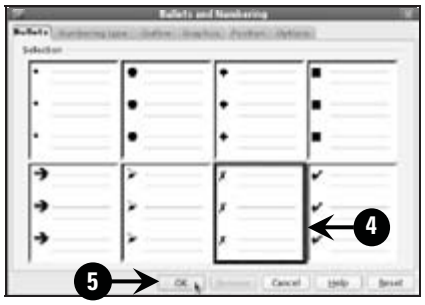


Fig.Writer-3.31



Fig.Writer-3.32

Let's now learn to insert the pictures in your document.

Working with Graphics

Graphics adds interactivity to your text document. Use of graphics in a text document make the concept more understandable. The OpenOffice.org Writer application provides facility to add graphics in the document. Once you have added graphics, you can modify it whenever required. You can add border to the graphics and also provide effects to the graphic, such as shadow.

In this section, you learn to add graphics in a document. You also learn to modify the graphic. You get acquaint with how to move a graphic to a different location.

Adding Graphics to a Document

Till now, you have learned to work with the text of a OpenOffice.org Writer document in various ways. However, OpenOffice.org Writer is not only limited to text, you can also add pictures to your OpenOffice.org Writer document. After adding a graphics, you can change its properties, such as its position, width, and height according to the requirement.

Perform the following steps to add a picture to your document:

1. *Click* the Insert menu from the Menu bar. A drop-down menu appears (Fig.Writer-3.33).
2. *Select* the **Picture** option. A further submenu appears (Fig.Writer-3.33).
3. *Click* the **From File** option, as shown in Fig.Writer-3.33:



Fig.Writer-3.33

An **Insert picture** dialog box appears (Fig.Writer-3.34).

4. Browse the location. In our case, the location is **Pictures** folder (Fig.Writer-3.34).
5. *Select* an image that is to be inserted. In our case, we have selected the **images.jpeg** file (Fig.Writer-3.34).
6. *Click* the **Open** button (Fig.Writer-3.34).

   The selected picture is inserted in the document (Fig.Writer-3.35).



Fig.Writer-3.34



Fig.Writer-3.35

Let's now learn to modify the inserted graphic.

Modifying the Graphic

After placing the graphic in your document, you can change its properties according to the requirements. You can modify properties, such as position, size, color, transparency, alignment, and graphic mode. This provides you a greater control on how the graphic would appear and blend with the text of your document.

In the following sections, you explore the Picture bar and learn how to apply a border and shadow to the graphic. Let's begin by getting acquaint with the Picture bar.

Exploring the Picture Bar

The Picture bar displays options specific to the object you are working with. When a graphic is placed in your document, the Picture bar immediately changes to show options for the graphic. Fig.Writer-3.36 shows the Picture bar that comprises the following options:

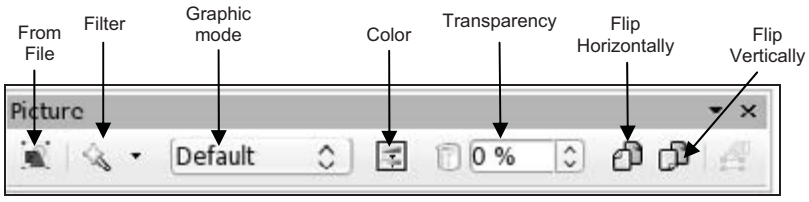


Fig.Writer-3.36

- **From File:** Opens a Picture dialog box that consists of tabs, such as Type, Options, Hyperlink, and Crop to modify the graphic.
- **Filter**: Opens a Graphic Filter bar with the help of which various filters, such as Invert, Sharpen, Smooth, Remove Noise, or Solarization can be used on the graphic.
- **Graphics mode:** Displays a list of display modes from which you can choose one for your graphic. For example, if you have a grayscale printer, you may want to make the graphic grayscale before printing it to save time. You can select the Grayscale option of the graphic mode drop-down list to do this. By clicking on the up or down arrow a list of graphic mode appears. The available modes of graphic are Default, Grayscale, Black/White, and Watermark.
- **Color:** Opens a Color toolbar on being clicked. This menu consists of:
  - **Red:** Allows you to increase or decrease the percentage of red color in the graphic
  - **Blue:** Allows you to increase or decrease the percentage of blue color in the graphic
  - **Green:** Allows you to increase or decrease the percentage of green color in the graphic
  - **Brightness:** Allows you to increase or decrease the brightness of the graphic
  - **Contrast:** Allows you to increase or decrease the contrast of the pixels of the graphic
- **Transparency:** Provides your graphic a faded, opaque, transparent and translucent look. The default transparency is 0%. You can increase the transparency by clicking the up arrow beside this option until the desired level of transparency is attained.
- **Flip Horizontally:** Flips the graphic horizontally, when it is clicked.
- **Flip Vertically:** Flips the graphic vertically, when it is clicked.

Applying a Border and Shadow to the Graphic

You can make the inserted graphic presentable and alluring by applying borders and shadows. You can apply border to the particular sides of a graphic according to the requirement, for example you can apply a border to only one side of a graphic. You can also select a border style from multiple line styles to apply as a border. Shadow styles can be applied to a graphic in different ways by changing the size, distance, and the color of the shadow depending upon the requirement.

Perform the following steps to apply a border and shadow to your graphic:

1. *Click* the **From File** icon from the Picture bar, as shown in Fig.Writer-3.37:



Fig.Writer-3.37

A **Picture** dialog box appears (Fig.Writer-3.38).

2. *Click* the **Borders** tab (Fig.Writer-3.38).
3. *Click* the button below the **Line arrangement** group. In our case, we have set all the four borders (Fig.Writer-3.39).
4. *Select* the **6.00 pt** size of the **Style** list box below the **Line** group (Fig.Writer-3.39).
5. *Click* the **Shadow style Position** button for the **Position** option in the **Shadow style** group. In our case, we have selected the **Cast Shadow to Top Left** option (Fig.Writer-3.39).
6. *Click* the **OK** button (Fig.Writer-3.39).

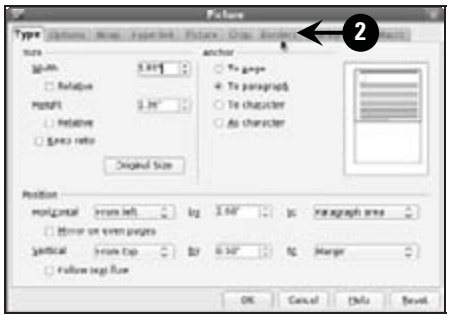


Fig.Writer-3.38

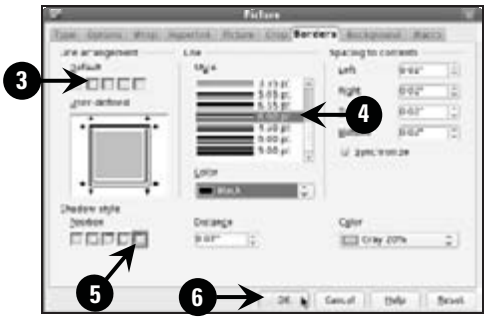


Fig.Writer-3.39

The applied border and shadow appears around the graphic object, as shown in Fig.Writer-3.40:



Fig.Writer-3.40

Let's now learn how to move the graphic.

Moving the Graphic

You have inserted a graphic in your document and have made some changes to it. After inserting the graphic, if you find that it has not been inserted at an appropriate location, you need not insert it again. You can simply move it from its original location to the desired location in the document.

Perform the following steps to move the graphic:

1. *Click* on the graphic (Fig.Writer-3.41). The graphic gets selected.
2. *Drag* the mouse to the new location, where you want to move the graphic (Fig.Writer-3.41).
3. *Leave* the mouse-pointer. The graphic appears at the new location (Fig.Writer-3.42).



Fig.Writer-3.41



Fig.Writer-3.42

Let's now learn to wrap the text around the graphic.

Wrapping the Text around Graphic

When you place the graphic in a text document, the text has to move aside to adjust the graphic so that the text and the graphic do not overlap. The distance between the graphic and the text can be wrapped around the graphic according to the requirement. By making the text wrap settings, you can determine how the text should be wrapped around the graphic. Following are the different ways to wrap the graphic:

- **None:** Applies no wrap to the graphic. This option is selected by default.
- **Before:** Wraps all the text surrounding the graphic before it that is on the left side.
- **After**: Wraps all the text surrounding the graphic after it that is on the right side.
- **Parallel:** Wraps the text on both left and right sides of the graphic.
- **Through:** Shows the text and graphic overlapping each other, but both remain visible.
- **Optimal:** Wraps the text around the graphic such that minimum amount of white space is left out.

Perform the following steps to wrap the text around the graphic:

1. *Click* the **From File** button from the Picture bar (Fig.Writer-3.43).
   A **Picture** dialog box appears (Fig.Writer-3.44).
2. *Click* the **Wrap** tab (Fig.Writer-3.44).



Fig.Writer-3.43

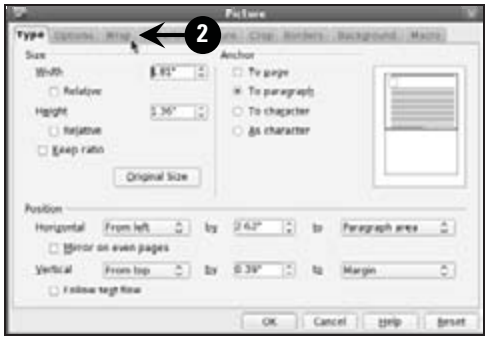


Fig.Writer-3.44

The Wrap tab gets selected (Fig.Writer-3.45).

3. *Select* the **Optimal** option in the **Settings** group (Fig.Writer-3.45).
4. *Click* the up arrow beside the **Left** spinbox in the **Spacing** group, to set the left spacing between the text and the graphic (Fig.Writer-3.45). In our case, we have selected the spacing as 0.10.
5. *Click* the up arrow beside the **Right** spinbox in the **Spacing** section, to set the right spacing between the text and the graphic (Fig.Writer-3.45). In our case, we have selected the spacing as 0.10.
6. *Click* the up arrow beside the **Top** spinbox in the **Spacing** section, to set the top spacing between the text and the graphic (Fig.Writer-3.45). In our case, we have selected the spacing as 0.10.
7. *Click* the up arrow beside the **Bottom** spinbox in the **Spacing** section, to set the bottom spacing between the text and the graphic (Fig.Writer-3.45). In our case, we have selected the spacing as 0.10.
8. *Click* the **OK** button (Fig.Writer-3.45).

   The text is wrapped around the graphic according to the specified settings (Fig.Writer-3.46).

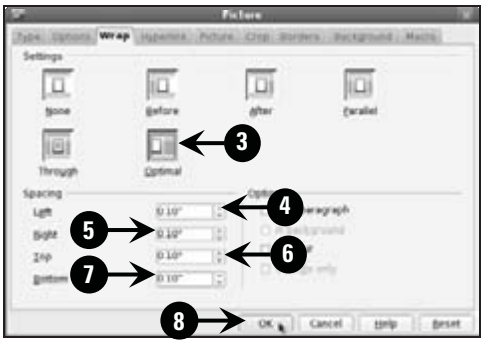


Fig.Writer-3.45



Fig.Writer-3.46

Let's now learn how to generate templates.

Working with Templates

A template is a pre-designed file that is used to create documents for various purposes. In OpenOffice.org Writer, you can not only design your documents based on the templates, but can also generate templates according to the requirement by selecting the appropriate option from the wizard.

In this section, you learn to generate the templates and design the documents based on the pre-designed templates.

Generating Templates

In the OpenOffice.org Writer application, you can generate the templates based on the requirement. For example, you want to create an agenda for a meeting but you are not sure about the format for such a document. In such situation, you can create format by using template for an agenda. This created agenda can be used as many times as required afterwards. However, data in different agendas is different from one another, only the pattern remains same.

Perform the following steps to generate a template:

1. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.Writer-3.47).
2. *Select* the **Wizards** option. A further submenu appears (Fig.Writer-3.47).
3. *Click* the **Agenda** option, as shown in Fig.Writer-3.47:

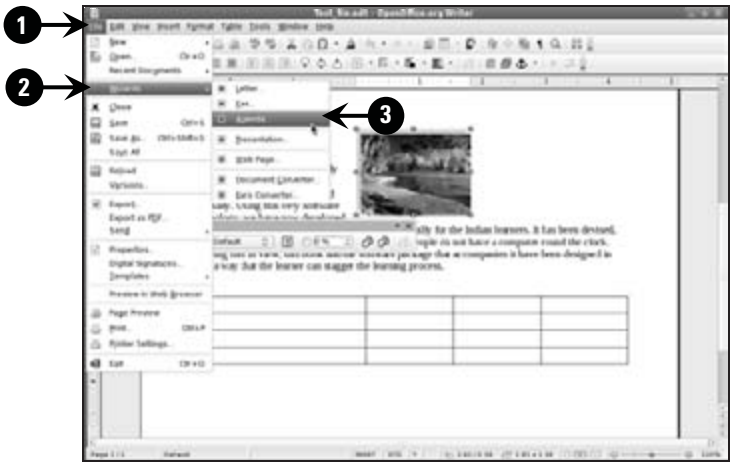


Fig.Writer-3.47

An **Agenda Wizard** wizard appears. A **Page design** page appears (Fig.Writer-3.48).

4. *Click* the up arrow in the **Page design** list box to select a design for the page. A drop-down list appears (Fig.Writer-3.48).
5. *Select* the **Elegant** option from the drop-down list (Fig.Writer-3.48).
6. *Click* the **Next** button (Fig.Writer-3.49).



Fig.Writer-3.48



Fig.Writer-3.49

A **General information** page appears in the **Agenda Wizard dialog box** (Fig.Writer-3.50).

7. *Click* the down arrow beside the **Date** option. A calendar appears (Fig.Writer-3.50).

8. *Select* the required date. In our case, we have clicked the **Today** button, as shown in Fig.Writer-3.50:

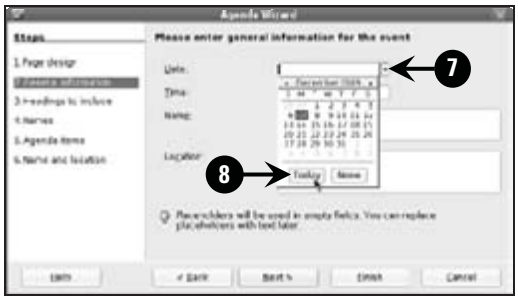


Fig.Writer-3.50

The selected date appears in the **Date** list box (Fig.Writer-3.51).

9. *Type* the time in the **Time** text box (Fig.Writer-3.51).
10. *Type* the name for the meeting in the **Name** text box (Fig.Writer-3.51). In our case, the name is **Guidelines review.**
11. *Type* the location for the meeting in the **Location** text box (Fig.Writer-3.51). In our case, the location is **Meeting room.**
12. *Click* the **Next** button (Fig.Writer-3.51).

    The **Headings to include** page appears (Fig.Writer-3.52).
13. *Select* the headings that you want to include in your Agenda (Fig.Writer-3.52).
14. *Click* the **Next** button (Fig.Writer-3.52).

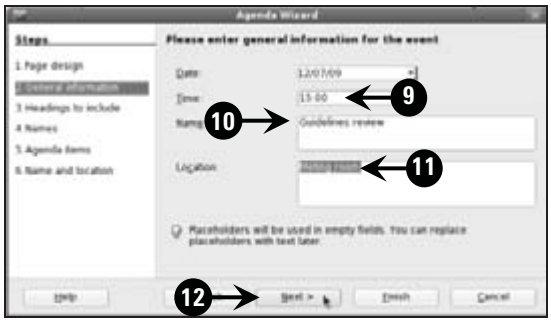


Fig.Writer-3.51

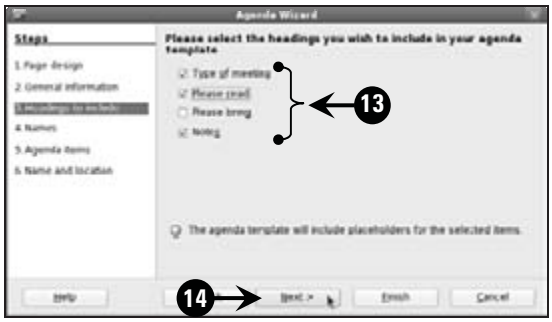


Fig.Writer-3.52

A **Names** page appears (Fig.Writer-3.53).

15. *Select* the **Chairperson** check box (Fig.Writer-3.53).
16. *Click* the **Next** button (Fig.Writer-3.53).

    The **Agenda items** page appears (Fig.Writer-3.54).
17. *Type* **Guidelines** in the first text box of the **Agenda** item column (Fig.Writer-3.54).
18. *Type* the name of the concerned person associated with the agenda item in the **Responsible** text box (Fig.Writer-3.54).
19. *Type* the duration of the agenda item in the **Duration** text box (Fig.Writer-3.54).
20. *Click* the **Next** button (Fig.Writer-3.54).

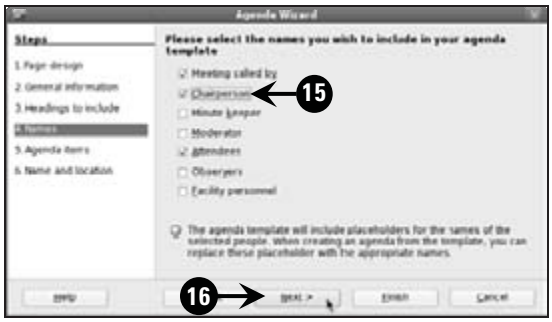


Fig.Writer-3.53

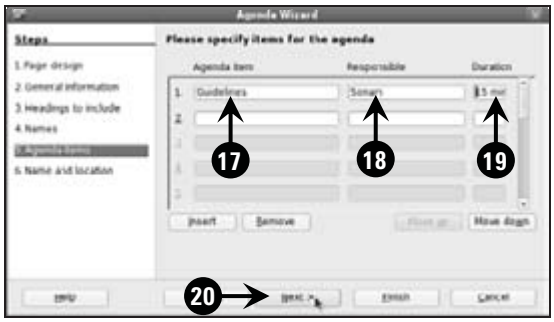


Fig.Writer-3.54

You can add as many agenda items according to the requirement as you want.

A **Name and location** page appears (Fig.Writer-3.55).

21. *Type* **Meeting** as the name for the template in the **Template name** text box (Fig.Writer-3.55).
22. *Click* the Browse button to browse to the location where you want to save the template. In our case, we save the Meeting template at a default location (Fig.Writer-3.55)
23. *Click* the **Finish** button, as shown in Fig.Writer-3.55:

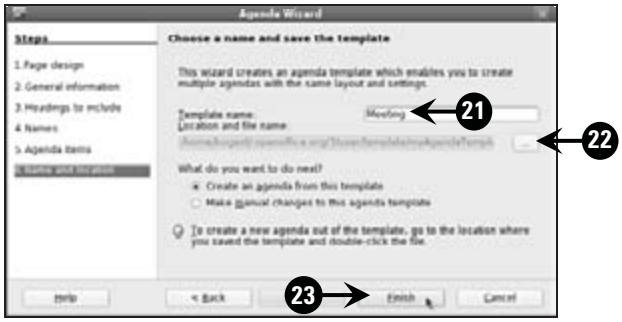


Fig.Writer-3.55

The template is created, as shown in Fig.Writer-3.56:

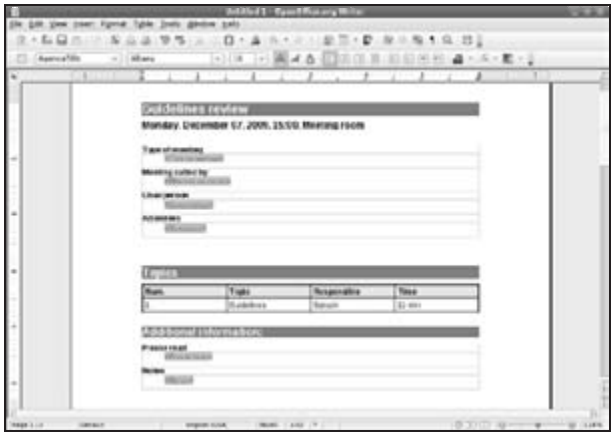


Fig.Writer-3.56

Let's now learn to design the document using template.

Designing Documents using Template

After generating a template for an agenda, every time you need to create an agenda you can use this template. In our case, the template created in the preceding section is used.

Perform the following steps to use a template to create a document:

1. *Click* the **File** menu. A drop-down menu appears (Fig.Writer-3.57).
2. *Select* the **New** option. A submenu appears (Fig.Writer-3.57).
3. *Click* the **Templates and Documents** option, as shown in Fig.Writer-3.57:

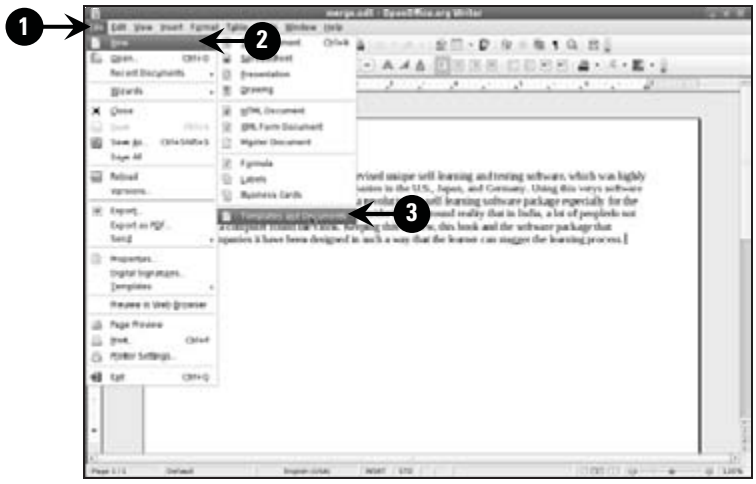


Fig.Writer-3.57

A **Templates and Documents-Templates** dialog box appears (Fig.Writer-3.58). By default, Templates option s activated.

4. *Click* the **My Templates** folder from the **Title** pane (Fig.Writer-3.58).

   A new page appears showing the templates present in **My Templates** folder (Fig.Writer-3.59).
5. *Select* the **Meeting** template (Fig.Writer-3.59).
6. *Click* the **Open** button (Fig.Writer-3.59).



Fig.Writer-3.58

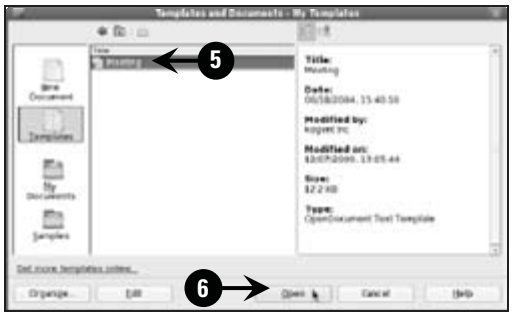


Fig.Writer-3.59

The template gets opened (Fig.Writer-3.60).

7. *Type* **General** besides the **Type of meeting** option (Fig.Writer-3.61).
8. *Type* **Mr. Varun** besides the **Meeting called by** option (Fig.Writer-3.61).
9. *Type* **Mr. Dhawal** besides the **Chairperson** option (Fig.Writer-3.61).
10. *Type* **HR Department** besides the **Attendees** option (Fig.Writer-3.61).

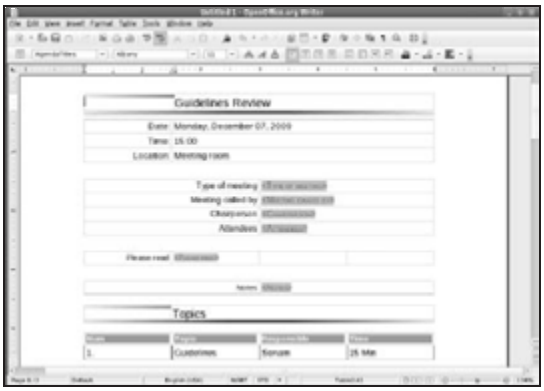


Fig.Writer-3.60

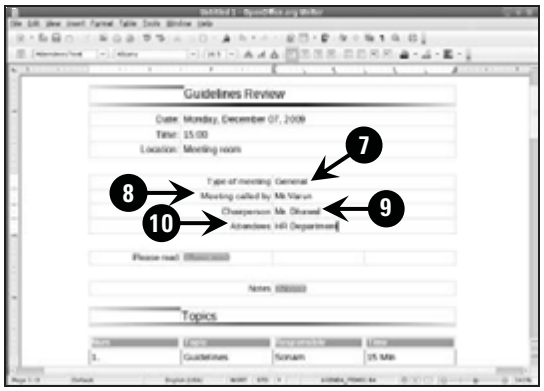


Fig.Writer-3.61

Perform the following steps to save a document created using a template:

1. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.Writer-3.62).
2. *Click* the **Save** option, as shown in Fig.Writer-3.62:



Fig.Writer-3.62

A **Save as** dialog box appears (Fig.Writer-3.63).

3. *Type* the name of the file with which you want to save the document in the **Name** text box. In our case, the filename is **sample_temp.odt** (Fig.Writer-3.63).
4. *Browse* to the location from the **Places** pane, where you want to save the document. In our case, we have selected **Desktop** as the location (Fig.Writer-3.63).
5. *Click* the **Save** button, as shown in Fig.Writer-3.63:



Fig.Writer-3.63

The document is saved with the specified name, as shown in Fig.Writer-3.64:



Fig.Writer-3.64

Let's now learn how to navigate within a document.

Navigating the Document

If the created document is large, and you have inserted a number of tables and bookmarks, you can locate these tables and bookmarks using the Navigator utility. In our case, we are locating a table.

Perform the following steps to use the navigator utility:

1. *Click* the **Navigator** icon from the Standard toolbar, as shown in Fig.Writer-3.65:

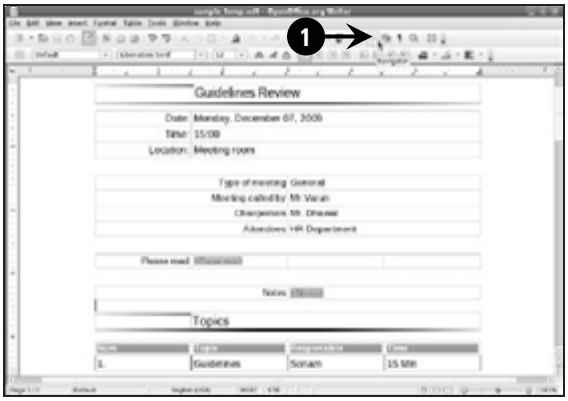


Fig.Writer-3.65

The navigator window appears, consisting of a list of objects included in the document (Fig.Writer-3.66).

2. *Click* the arrow besides the **Tables** option, as shown in Fig.Writer-3.66:

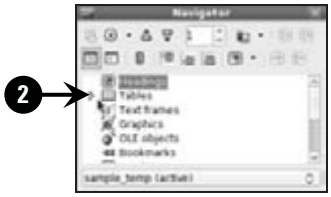


Fig.Writer-3.66

3. *Select* the table you want to locate. In our case, we have selected **AGENDA_TOPICS** table (Fig.Writer-3.67).

   The cursor appears at the specified table (Fig.Writer-3.67).

4. *Click* the **Close** button to close the navigator window, as shown in Fig.Writer-3.67:

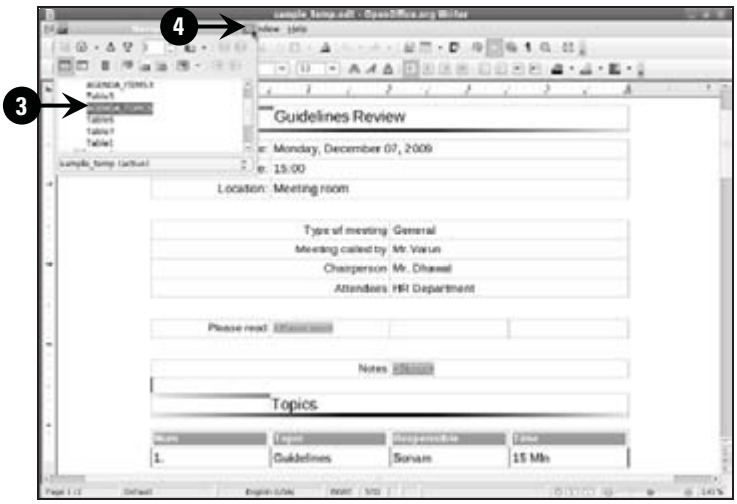


Fig.Writer-3.67

Let's now learn how to apply styles in the document.

Applying Styles

Style is an assortment of certain text properties, such as fonts, size, alignment, and indents that can be applied to a portion of the text. In Writer, there is a list of various styles that you can apply to the text of your document. For example, there are a number of styles for headings of different levels.

Perform the following steps to apply styles:

1. *Select* the text on which you want to apply a style, as shown in Fig.Writer-3.68:

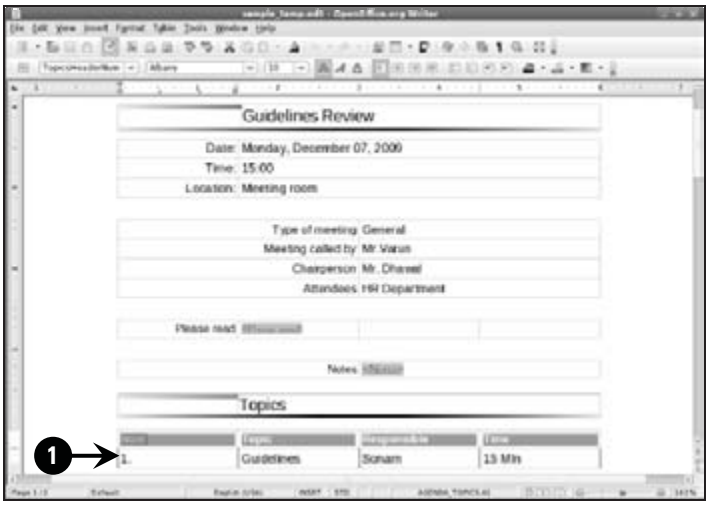


Fig.Writer-3.68

2. *Click* the down-arrow in the **Apply Style** dialog box. A drop-down list appears (Fig.Writer-3.69).
3. *Select* the desired Style from the list. In our case, we have selected the **mtime** style, as shown in Fig.Writer-3.69:

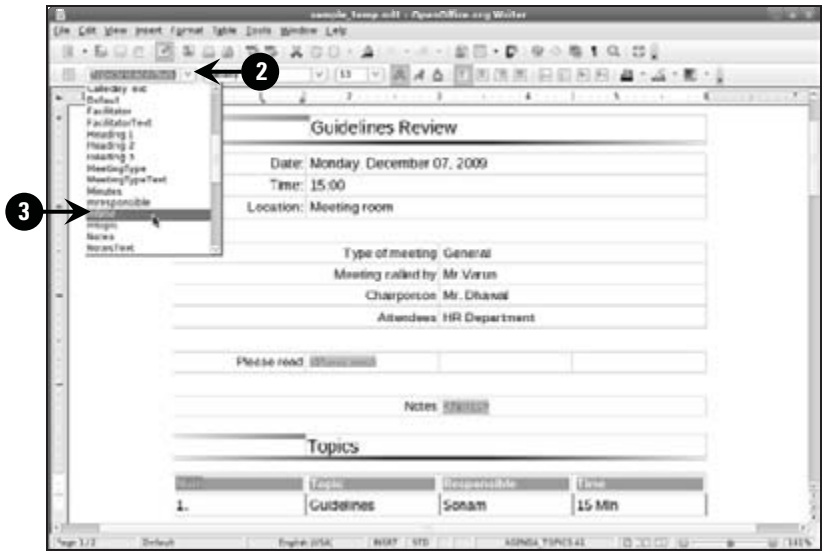


Fig.Writer-3.69

The selected style gets applied, as shown in Fig.Writer-3.70:

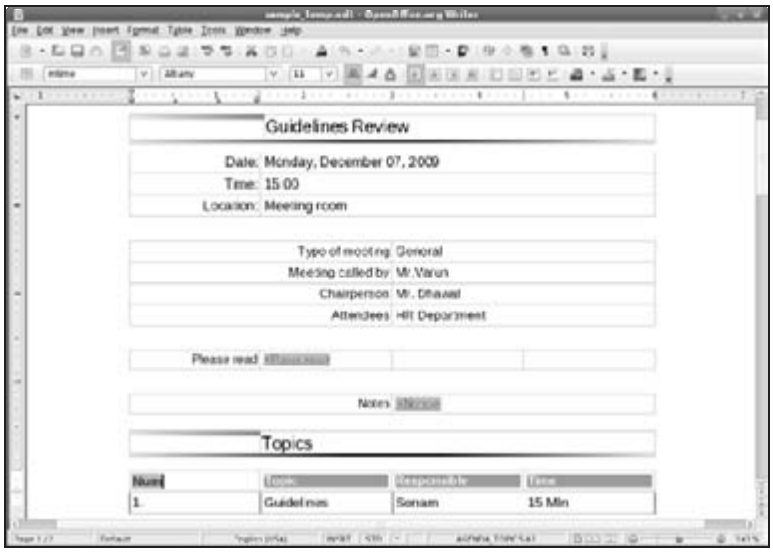


Fig.Writer-3.70

Let's now learn how to preview the document before printing it.

Previewing the Document

You can determine how your document appears after making the changes by previewing it. Perform the following steps to preview the document:

1. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.Writer-3.71).
2. *Click* the **Page Preview** option, as shown in Fig.Writer-3.71:

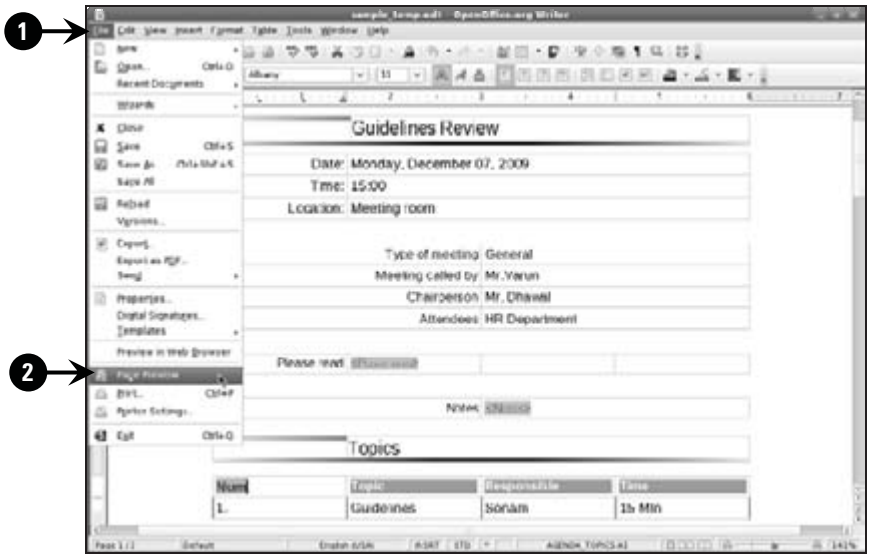


Fig.Writer-3.71

The preview of the document is displayed (Fig.Writer-3.72).

3. *Click* the **Close Preview** icon to close the preview, as shown in Fig.Writer-3.72:

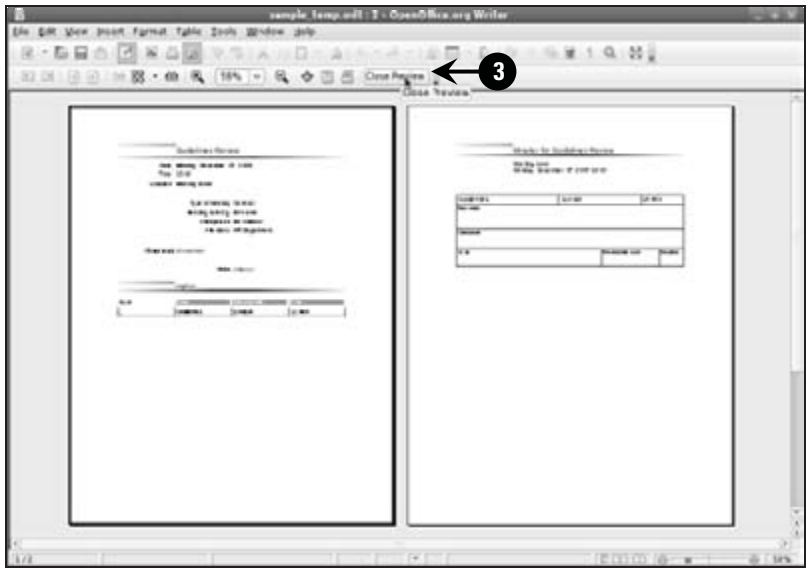


Fig.Writer-3.72

Let's now learn to print a document.

Printing a Document

The printed copy of any electronic file is known as a printout. You can print your document to get its printout. In the following sub sections, let's learn how to take a printout and how to add a printer.

Taking a Printout

Perform the following steps to take a printout of your document:

1. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.Writer-3.73).
2. *Click* the **Print** option, as shown in Fig.Writer-3.73:

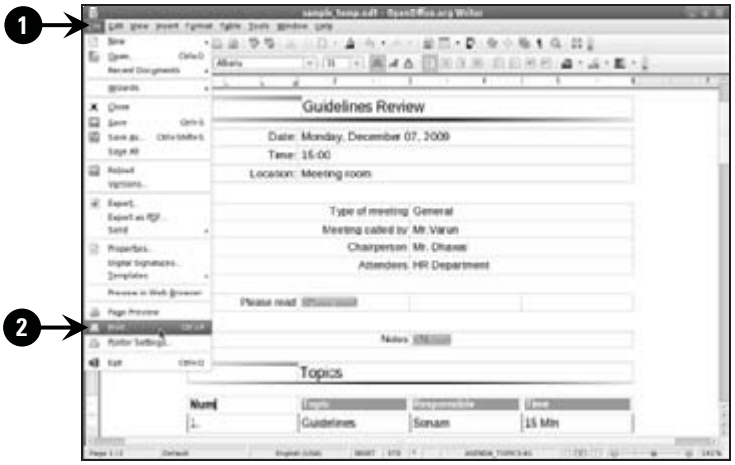


Fig.Writer-3.73

A **Print** dialog box appears (Fig.Writer-3.74).

3. *Click* the down-arrow besides the **Name** spin-box to select the printer. In our case, the selected printer is **HP- Laserjet-3005** (Fig.Writer-3.74).
4. *Select* the number of pages that you want to print from the **Print range** section. In our case, we have selected the range as **All pages** (Fig.Writer-3.75).
5. *Click* the up or down arrow to select the number of copies of printout according to the requirement. In our case, the number of copies is 2 (Fig.Writer-3.75).
6. *Click* the **OK** button (Fig.Writer-3.75).

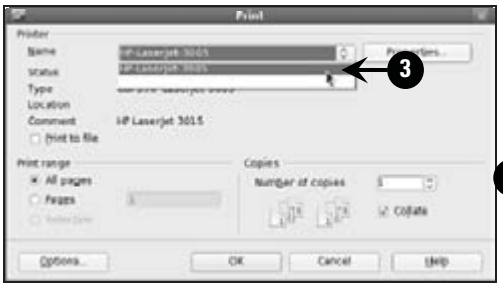


Fig.Writer-3.74



Fig.Writer-3.75

The selected printer prints the document. In case, the printer is not added to your computer, let's proceed with our next sub section and learn how to add a printer.

Adding a Printer

Perform the following steps to add a printer:

1. *Click* the **System** menu from the top panel. A drop-down menu appears (Fig.Writer-3.76).
2. *Select* the **Administration** option. Further a submenu appears (Fig.Writer-3.76).
3. *Click* the **Printing** option, as shown in Fig.Writer-3.76:



Fig.Writer-3.76

A **Printer configuration – localhost** dialog box appears (Fig.Writer-3.77)**.**

4. *Click* the down-arrow besides the **New** option. A drop-down list appears (Fig.Writer-3.77).
5. *Select* the **Printer** option (Fig.Writer-3.77).
   An **Authentication (fetching device list)** dialog box appears (Fig.Writer-3.78).
6. *Type* the root user password besides the **Password** text box (Fig.Writer-3.78).
7. *Click* the **OK** button (Fig.Writer-3.78).



Fig.Writer-3.77



Fig.Writer-3.78

A **New Printer** wizard appears (Fig.Writer-3.79), you have to wait for some time till system searches printers.

8. *Click* the **Forward** button, as shown in Fig.Writer-3.79:



Fig.Writer-3.79

A **Choose Driver** page appears (Fig.Writer-3.80). By default, **Generic** is selected from the **Makes** pane.

9. *Click* the **Forward** button (Fig.Writer-3.80).
   A **Describe Printer** page appears (Fig.Writer-3.81). In our case, we are proceeding with default settings.
10. *Click* the **Apply** button (Fig.Writer-3.81).

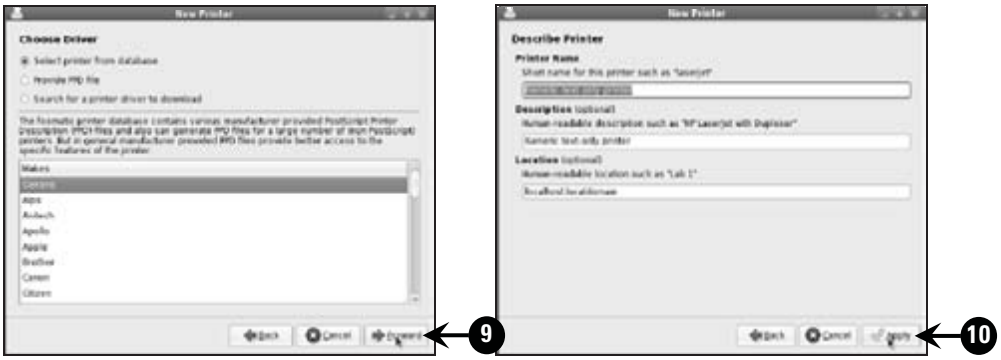


Fig.Writer-3.80 Fig.Writer-3.81



A message box appears asking for printing a test page. You can print the test page or close the message box without printing.

The Printer is added (Fig.Writer-3.82).

11. *Right-click* the printer icon. A context menu appears (Fig.Writer-3.83).
12. *Click* the **Properties** option (Fig.Writer-3.83).

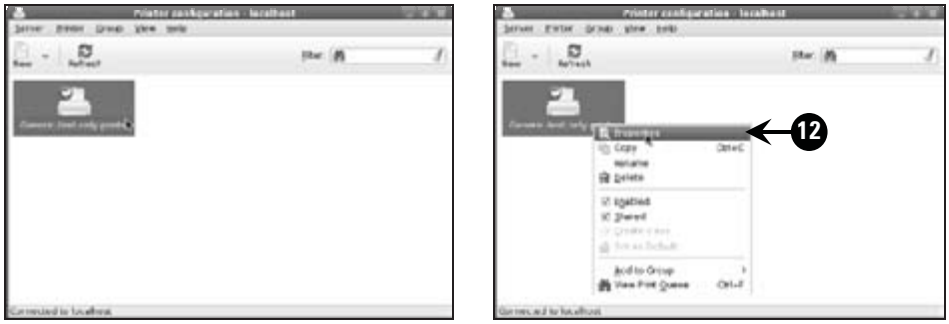


Fig.Writer-3.82 Fig.Writer-3.83

A **Printer Properties** dialog box appears (Fig.Writer-3.84).

13. *Type* **HP Laserjet 3015** in the **Description** text box (Fig.Writer-3.84).
14. *Type* path in the **Device URI** text box (Fig.Writer-3.84).
15. *Click* the **Apply** button (Fig.Writer-3.84).
    An authentication dialog box appears (Fig.Writer-3.85).
16. *Type* the root password in the Password for root text box (Fig.Writer-3.85).
17. *Click* the **OK** button (Fig.Writer-3.85).

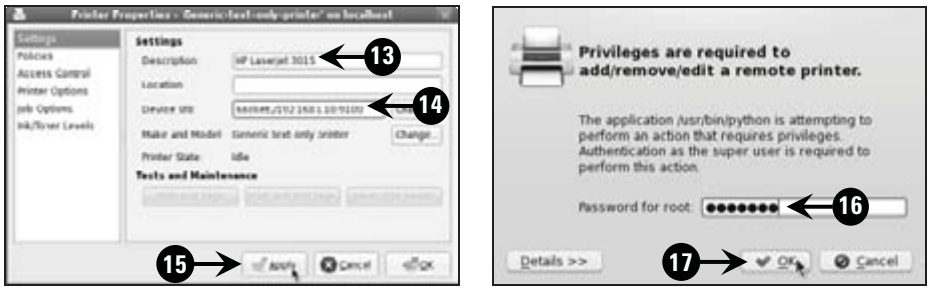


Fig.Writer-3.84 Fig.Writer-3.85

The Printer Properties -' Generic-text-only-printer' on localhost dialog box reappears (Fig.Writer-3.84).

18. *Click* the **Print Test Page** button (Fig.Writer-3.86).
    A message box appears, showing the status of **Print Test Page** command (Fig.Writer-3.87).
19. *Click* the **OK** button (Fig.Writer-3.87).



Fig.Writer-3.86



Fig.Writer-3.87

The Printer Properties -' Generic-text-only-printer' on localhost dialog box reappears (Fig.Writer-3.88).

20. *Click* the **OK** button to close the Printer Properties -' Generic-text-only-printer' on localhost dialog box, as shown in Fig.Writer-3.88:

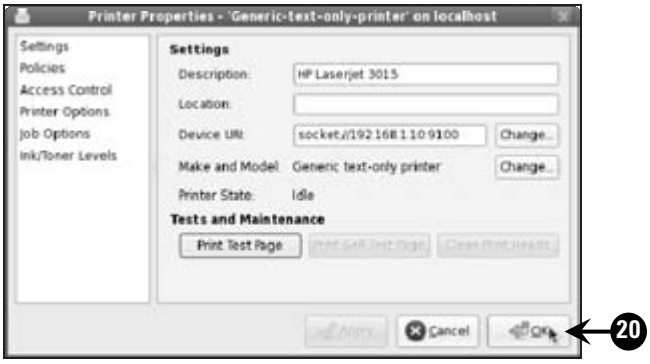


Fig.Writer-3.88

With this we come to the end of this chapter, let's quickly summarize the main points of the chapter.

Summary

In this chapter, you have learned to set the page margins for a document. You also learned about headers and footers. Further, in the chapter you have learned to work with a table. You have learned to format the text and emphasize the text by highlighting, aligning, and applying bulleted and numbered lists. You also learned to add pictures in a document. Further, you get acquaint working with graphic including modifying the graphic and wrapping the text around the graphic. Next, you created template and used it to generate a Writer document. You get familiar with the navigator and styles utility of OpenOffice.org Writer. In the end, you learn to preview and print a document along with adding a printer.

IMPRESS

CHAPTER

1

Getting Started with OpenOffice.org Impress

In this Chapter:

- Starting OpenOffice.org Impress
- Exploring the Impress Interface
- Inserting a New Slide
- Inserting Text in a Slide
- Saving a Presentation
- Creating a Presentation Using Templates
- Closing the OpenOffice.org Impress Presentation and Quitting the Impress

In the Linux operating system, OpenOffice.org Impress is a presentation program, which is the part of the OpenOffice.org suite. OpenOffice.org Impress (or Impress) is developed by Sun Microsystems. In addition, it is similar to Microsoft PowerPoint as it provides features to create different types of multimedia presentations. In OpenOffice.org Impress, you can enhance the clarity of your presentation with the help of some in-built features, such as special effects, animation, and drawing tools. Impress allows you to create slides that can contain different elements, including text, bulleted and numbered lists, tables, charts, clip art, and a wide array of graphic objects. It also includes features, such as spell check, pre-set text styles, attractive background styles, and a Help menu.

In this chapter, you learn to start OpenOffice.org Impress. Next, you explore the components of the OpenOffice.org Impress application window. Further, you learn to insert a new slide in your presentation. You also learn to insert text in a slide. In addition, you learn to save the presentation. You also learn to create a presentation using templates. Finally, you learn to close the presentation and quit Impress.

Let's we are discussing hot to start OpenOffice.org Impress.

Starting OpenOffice.org Impress

When you install Linux operating system (Fedora 11, in our case) in your computer, OpenOffice.org applications, such as OpenOffice.org Writer, OpenOffice.org Calc, and OpenOffice.org Impress are also installed by default. You need to start OpenOffice.org Impress to make your presentation. When you open OpenOffice.org Impress, a blank slide appears, by default.

Let's perform the following steps to open Impress:

1. *Select* the **Applications** menu from the top panel of the Linux desktop. A drop-down list appears (Fig.Impress-1.1).
2. *Select* the **Office** option from the drop-down list. A submenu appears (Fig.Impress-1.1).
3. *Select* the **OpenOffice.org Impress** option from the submenu, as shown in Fig.Impress-1.1:

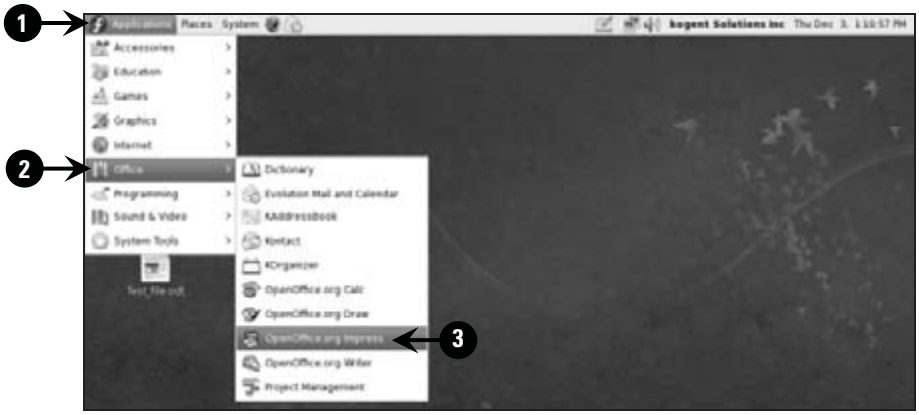


Fig.Impress-1.1

Presentation Wizard appears (Fig.Impress-1.2).

4. *Select* a presentation type under the **Type** section. In our case, the default option that is the **Empty presentation** is selected (Fig.Impress-1.2)**.**



If you do not want the wizard to start every time you start Impress, select the Do not show this wizard again check box in Presentation Wizard.

5. *Click* the **Create** button (Fig.Impress-1.2).

   The OpenOffice.org Impress application window appears with a blank slide (Fig.Impress-1.3).



Fig.Impress-1.2

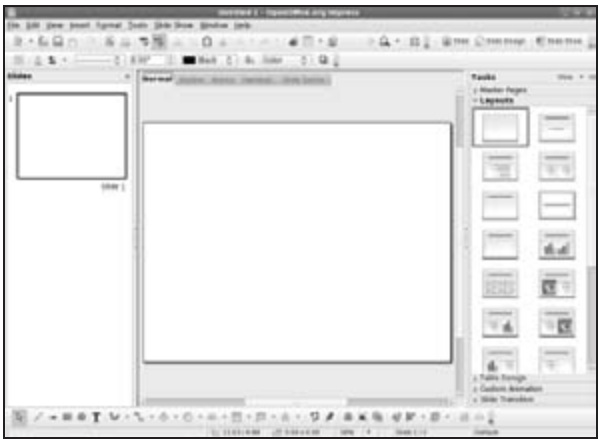


Fig.Impress-1.3

After learning how to open OpenOffice.org Impress, let's now learn about the components of the OpenOffice.org Impress application window.

Exploring the Impress Interface

The OpenOffice.org Impress interface consists of several components, such as title and menu bars. These components allow you to perform different tasks, such as open a new document from the File menu. Fig.Impress-1.4 shows the OpenOffice.org Impress interface with its components:

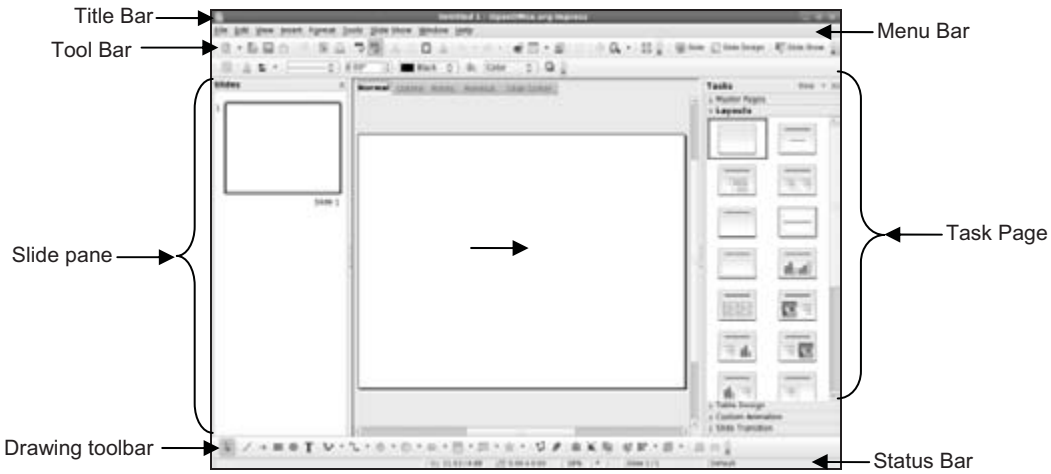


Fig.Impress-1.4

Let's discuss the components of the OpenOffice.org Impress interface in detail.

- **Title Bar**: Displays the name of the application and presentation. It consists of three buttons that are used to minimize, maximize, and close the OpenOffice.org Impress application window.
- **Menu Bar**: Displays various menus, such as File, Insert, and View which are used to save a presentation, insert a new slide, and view the slide show. You can display the options of any menu by clicking the left mouse button on the menu.
- **Toolbar**: Contains various commands, such as cut, copy, and paste, which have icons associated with them.

- **Drawing Toolbar**: Lets you insert commonly used shapes, such as arrows, circles, banners, or lines, in a slide. It is usually located at the bottom of the OpenOffice.org Impress application window. It also allows you to insert text, flowcharts, and callouts, in your presentation.
- **Status Bar**: Contains information, such as the language of the selected text and spell check status that you may find useful while making a presentation. The status bar is located at the bottom of the OpenOffice.org Impress application window,
- **Slide Pane**: Displays the thumbnails of the slides of your presentation located at the left of the OpenOffice.org Impress application window. When you select a slide in this pane, it appears in the workspace.
- **Task Pane**: Contains various sections, such as Master Pages, Layouts, Table Design, Custom Animation, and Slide Transition. It is located in the left of the OpenOffice.org Impress application window.
- **Workspace**: Displays the selected slide in the workspace area. It contains five tabs, Normal, Outline, Notes, Handout, and Slide Sorter. These five tabs are called view buttons. The actual workspace section is below the view buttons. In the workspace, each view button is designed to accomplish certain tasks. Fig.Impress-1.5 shows the workspace view buttons:



Fig.Impress-1.5

Let's discuss these tabs in detail.

- **The Normal View:** Lets you format, design, and add text, graphics, and animation effects to the slide. The normal view is the default view for creating slides. Fig.Impress-1.6 shows the normal view of a slide:

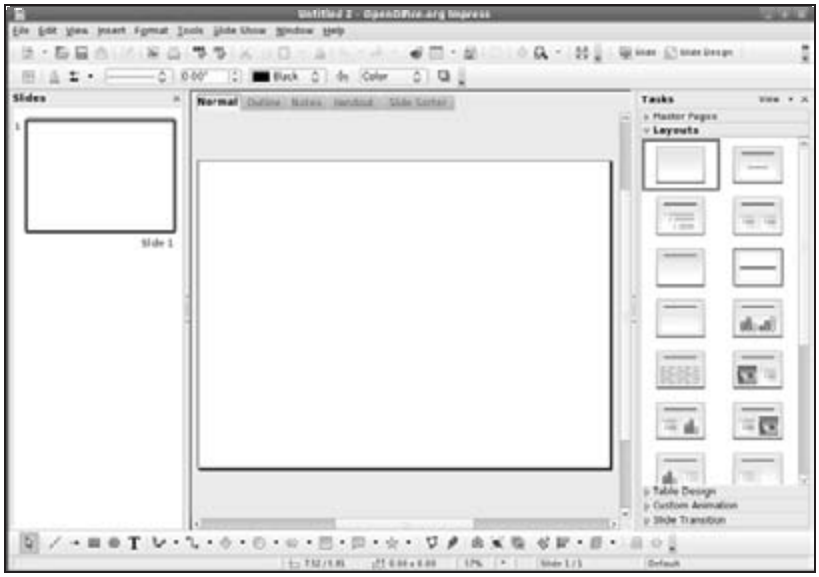


Fig.Impress-1.6

- **The Outline View**: Shows all the slides of a presentation in the numbered sequence.

Let's perform the following step to use the outline view:

1. *Select* the **Outline** tab, as shown in Fig.Impress-1.7:

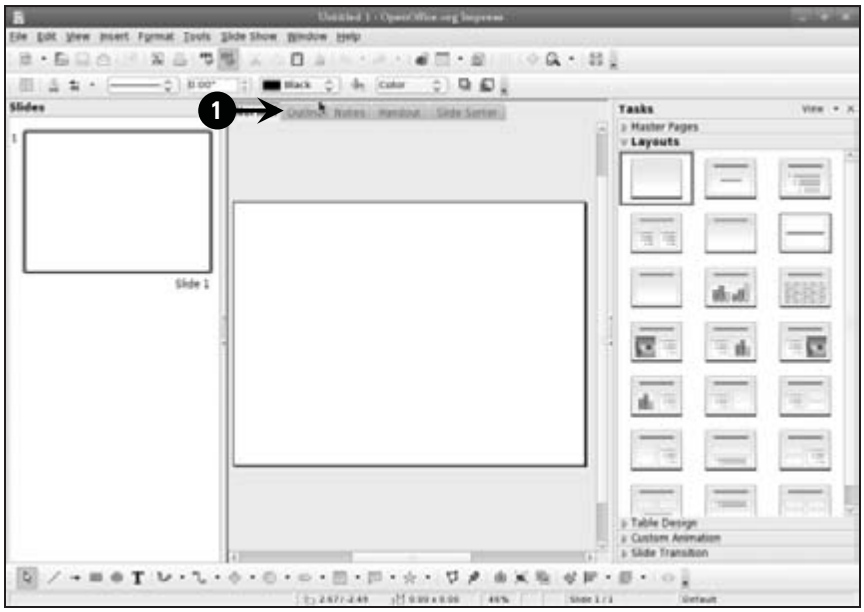


Fig.Impress-1.7

The outline view appears, as shown in Fig.Impress-1.8:

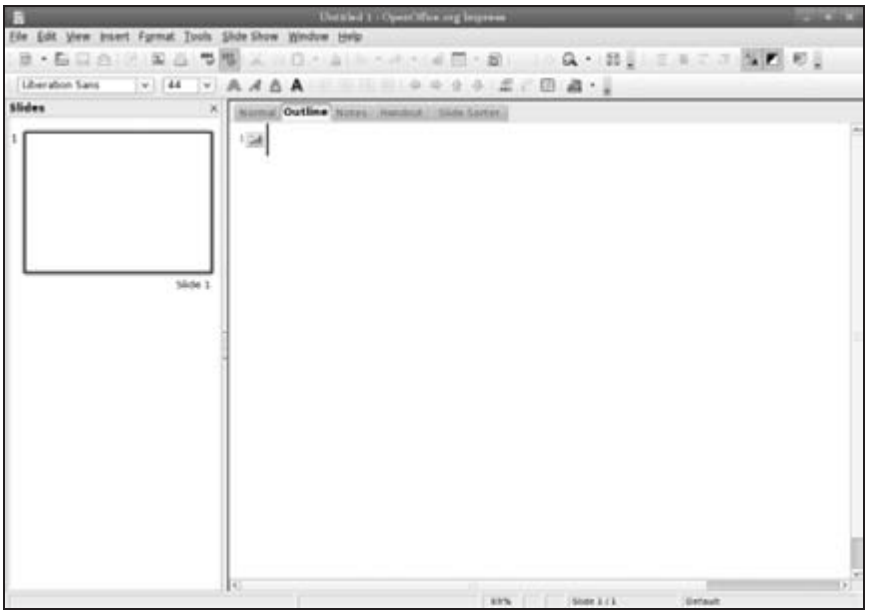


Fig.Impress-1.8

- **The Notes View**: Lets you add notes to the slides. Let's perform the following steps to add notes to a slide:

1. *Select* the Notes tab in the workspace, as shown in Fig.Impress-1.9:

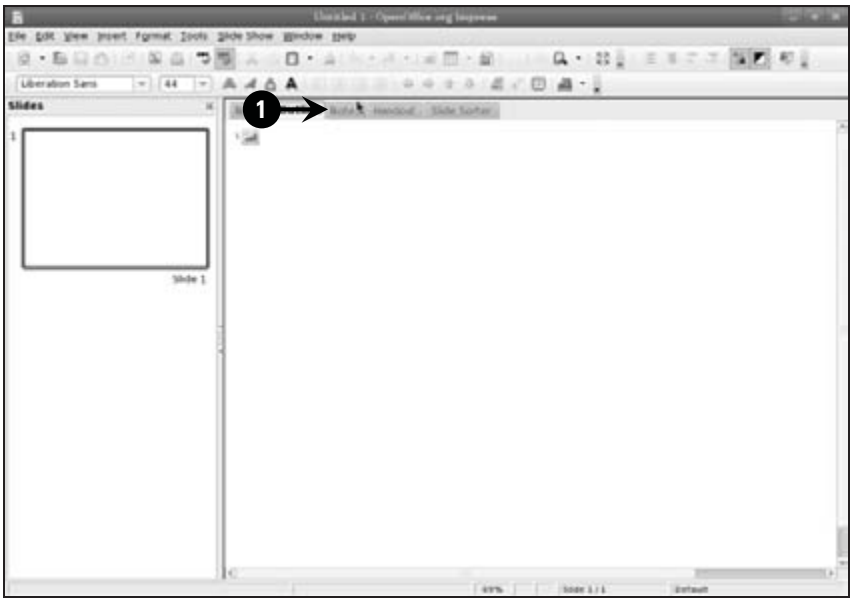


Fig.Impress-1.9

The notes view appears (Fig.Impress-1.10).

2. *Type* notes in the slide. In our case, we have typed **Welcome to the Linux World**, as shown in Fig.Impress-1.10:

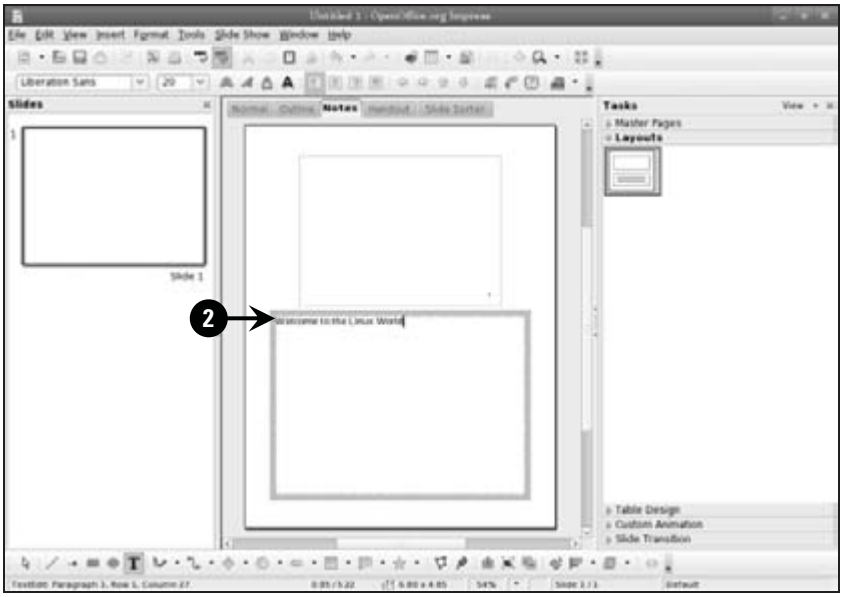


Fig.Impress-1.10

- **The Handout View:** Contains 1 to 6 thumbnails of the slides. A handout is a special view of the presentation which is suitable to be printed and distributed to the audience. Let's perform the following steps to use the handout view:

1. *Select* the **Handout** tab in the workspace area, as shown in Fig.Impress-1.11:

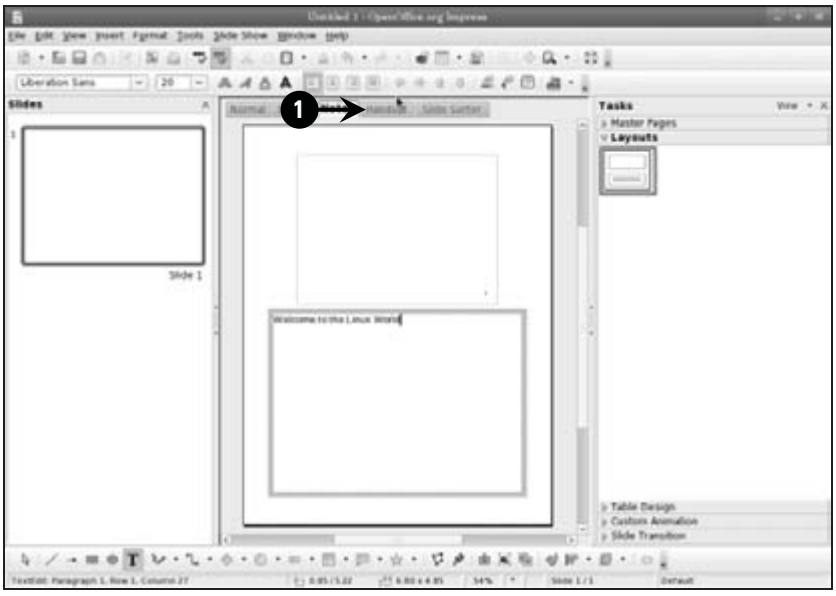


Fig.Impress-1.11

The handout view appears, as shown in Fig.Impress-1.12:

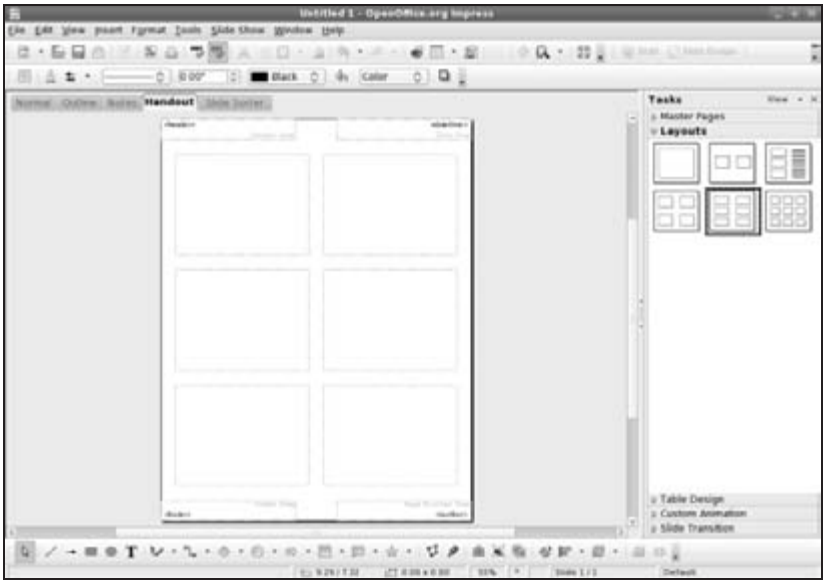


Fig.Impress-1.12

- **The Slide Sorter View:** Contains all the slide thumbnails. You can use this view to work with a group of slides or a single slide. Let's perform the following steps to use the slide sorter view:

1. *Select* the **Slide Sorter** tab in the workspace, as shown in Fig.Impress-1.13:

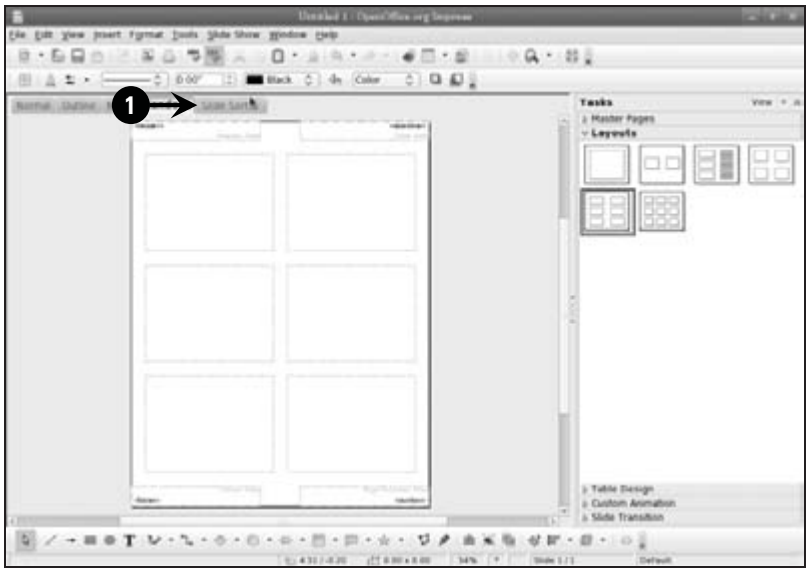


Fig.Impress-1.13

The slide sorter view appears in the workspace, as shown in Fig.Impress-1.14:

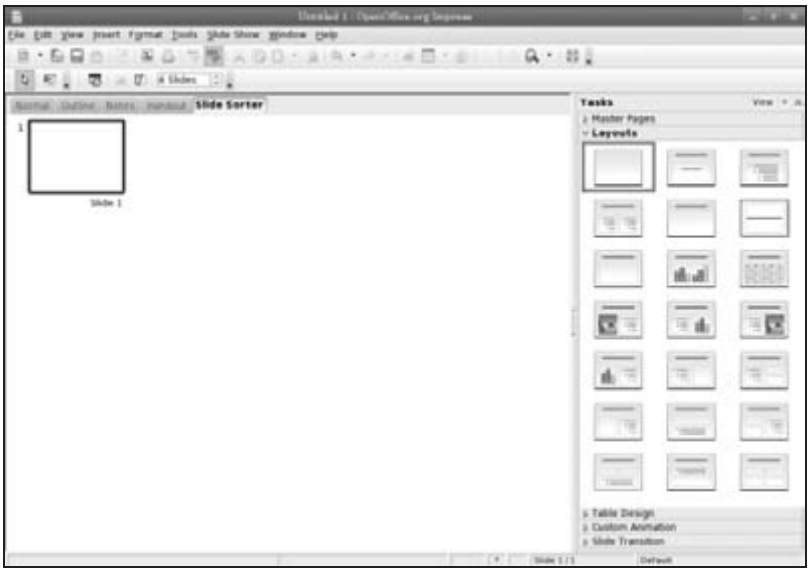


Fig.Impress-1.14

You need to select the **Normal** tab to go back to the normal view.

After learning about the components of the OpenOffice.org Impress application window, let's now learn how to insert a new slide in a presentation.

Inserting a New Slide

As discussed, when you open OpenOffice.org Impress, only one slide (blank slide) appears in the workspace. However, you can insert more slides in your presentation. You can select any slide from the prepackaged layout available in the Layouts section of the Tasks pane as per your requirement. Most

commonly used slides are the Title Slide (which also contain a section for the subtitles). The blank or the default slide contains a title section. Let's perform the following steps to insert a new slide:

1. *Select* the **Insert** menu from the menu bar. A drop-down list appears (Fig.Impress-1.15).
2. *Select* the **Slide** option from the drop-down list, as shown in Fig.Impress-1.15:



Fig.Impress-1.15

A new slide appears in the Slides pane, as shown in Fig.Impress-1.16:

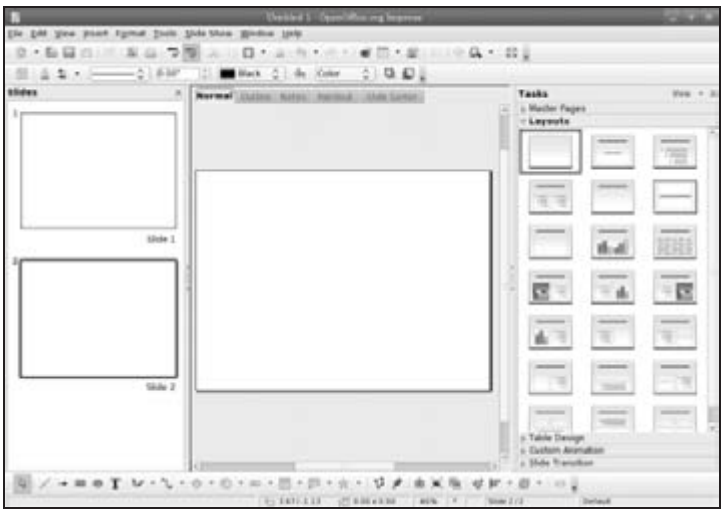


Fig.Impress-1.16

After learning about inserting a new slide, let's learn about inserting text in a slide.

Inserting Text in a Slide

After inserting a new slide in your presentation, you can insert text in it. In OpenOffice.org Impress, you can insert text using the **Text** tool from the **Drawing** toolbar.

Let's perform the following steps to insert text in a slide:

1. *Click* the **Text** button from the **Drawing** toolbar, as shown in Fig.Impress-1.17:

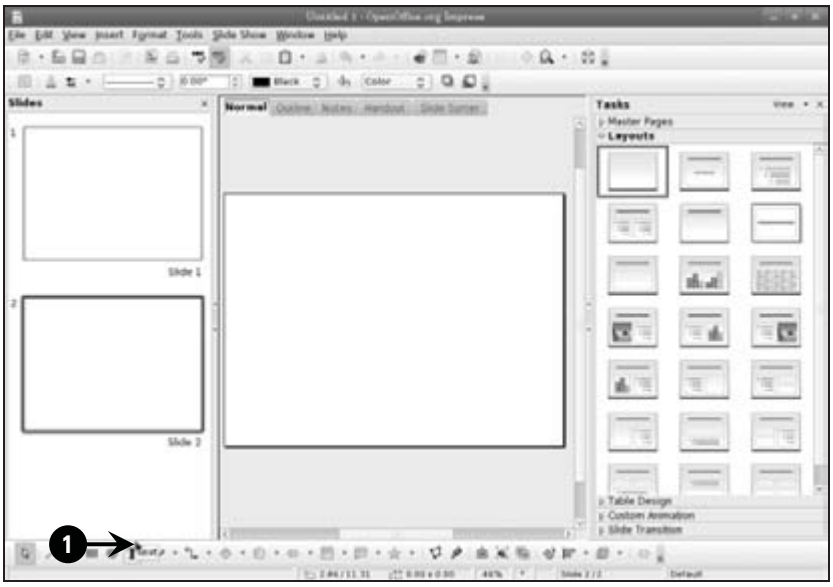


Fig.Impress-1.17

2. *Click* the mouse-pointer at the place from where you want to type text and then drag it. A text box appears at the location, as shown in Fig.Impress-1.18:

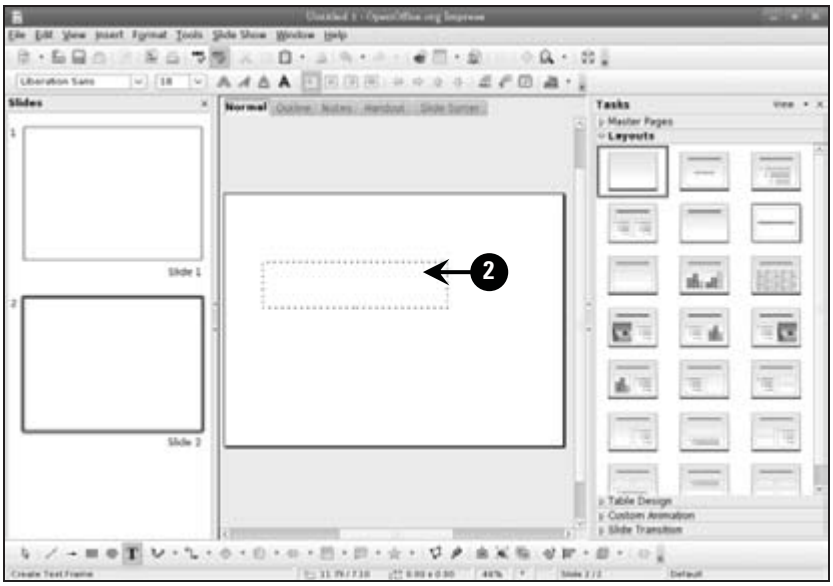


Fig.Impress-1.18

3. *Type* the desired text in the text box. In our case, we have typed **Welcome to the Linux World**, as shown in Fig.Impress-1.19:

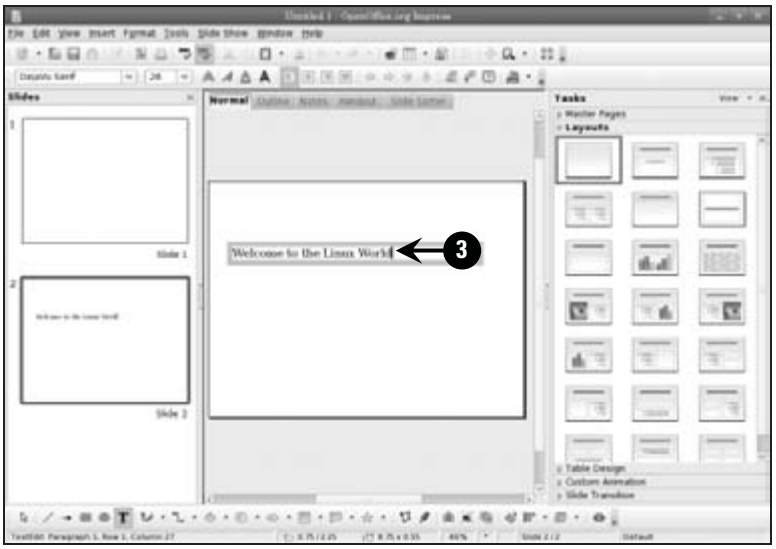


Fig.Impress-1.19

After learning how to insert text in a slide, let's now learn how to save a presentation.

Saving a Presentation

After completing your presentation and inserting the text in the presentation, you should save the presentation. The saving helps you to access the presentation in future as and when the need arises. In addition, it enables you to retrieve your data if deleted accidentally.

Let's perform the following steps to save a presentation:

1. *Select* the **File menu** from the menu bar. A drop-down list appears (Fig.Impress-1.20).
2. *Select* the **Save** option from the drop-down list, as shown in Fig.Impress-1.20:

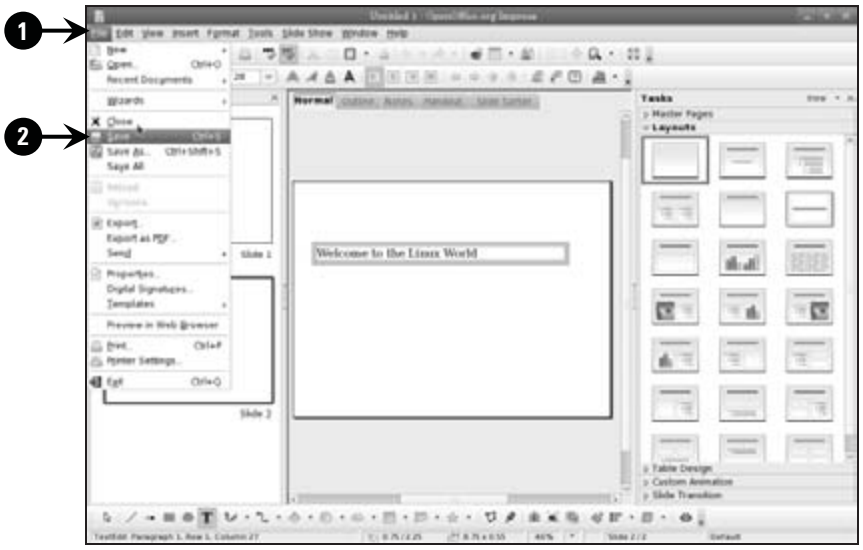


Fig.Impress-1.20

The **Save** dialog box appears (Fig.Impress-1.21).

3. *Type* the presentation name in the **Name** text box. In our case, we have typed **Linux Presentation** (Fig.Impress-1.21).
4. *Click* the **Save** button, as shown in Fig.Impress-1.21:



Fig.Impress-1.21

Your presentation saved with the specified name, which appears at the **title** bar of the OpenOffice.org Impress application window , as shown in Fig.Impress-1.22:

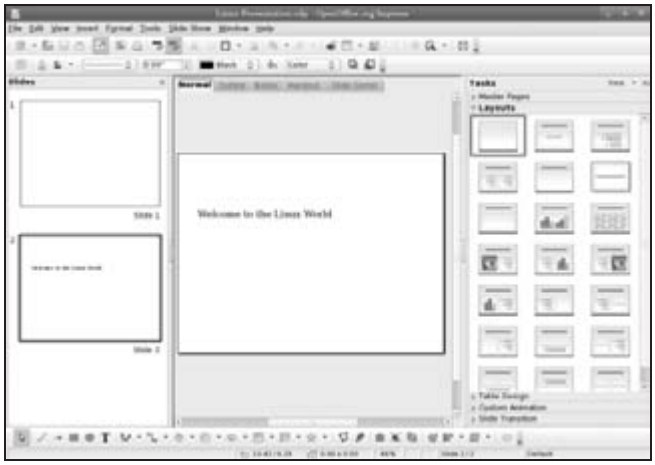


Fig.Impress-1.22

After learning how to insert text in a slide, let's now learn to create a presentation using templates.

Creating a Presentation Using Templates

All documents in OpenOffice.org are based on templates. However, Impress is slightly different from other OpenOffice.org applications because it starts with Presentation Wizard unless you have elected to turn the wizard off. OpenOffice.org uses several default presentation templates. If you have not defined your own default template, OpenOffice.org uses an in-built blank template supplied with the program.

Templates can contain everything that regular documents have, such as text, graphics, a set of styles, and user-specific setup information, such as measurement units, language, the default printer, and toolbar and menu customization.

Let's perform the following steps to create a presentation using templates:

1. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Impress-1.23).
2. *Select* the **Wizards** option from the drop-down list. A submenu appears (Fig.Impress-1.23).
3. *Select* the **Presentation** option from the submenu, as shown in Fig.Impress-1.23:

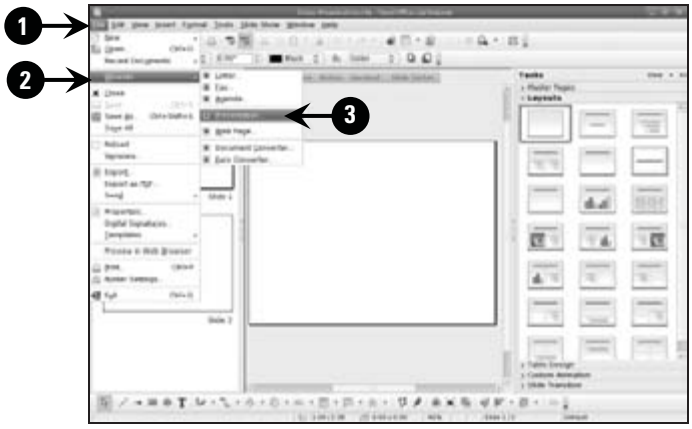


Fig.Impress-1.23

Presentation Wizard (Default) appears (Fig.Impress-1.24).

4. *Select* the **From template** radio button in the Type section of the **Presentation Wizard (Default)** (Fig.Impress-1.24).
5. *Select* the name of the presentation. In our case, we have selected **Recommendation of a Strategy** (Fig.Impress-1.25).
6. *Click* the **Next** button (Fig.Impress-1.25).



Fig.Impress-1.24

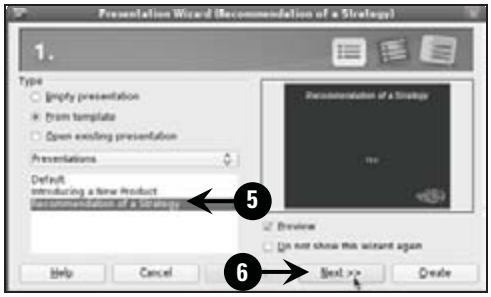


Fig.Impress-1.25

Page 2 of Presentation Wizard appears (Fig.Impress-1.26).

7. *Click* the up-down arrow button under the **Select a slide design** list box. A drop-down list appears (Fig.Impress-1.26).
8. *Select* the **Presentation Backgrounds** option from the list (Fig.Impress-1.26).

   A list of background colors appears (Fig.Impress-1.27).
9. *Select* the desired color for the selected template. In our case, we have selected the **Blue Lines and Gradients** option (Fig.Impress-1.27).
10. *Click* the **Next** button (Fig.Impress-1.27).

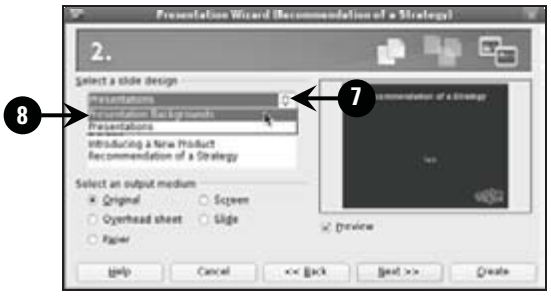


Fig.Impress-1.26



Fig.Impress-1.27

Page 3 in Presentation Wizard appears (Fig.Impress-1.28).

11. *Click* the arrow button beside the **Effect** option under the **Select a slide transition section**. A drop-down list appears (Fig.Impress-1.28).
12. *Select* the **Wipe Right** option from the list (Fig.Impress-1.28).
13. *Click* the arrow button beside the **Speed** option. A drop-down list appears (Fig.Impress-1.29).
14. *Select* the desired speed. In our case, we have selected the **Fast** speed (Fig.Impress-1.29).

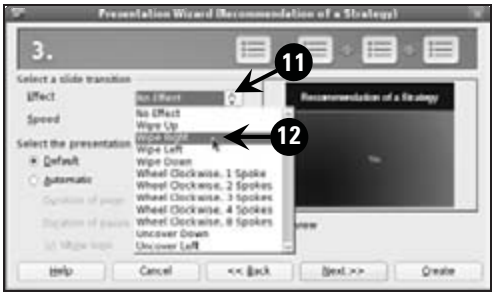


Fig.Impress-1.28

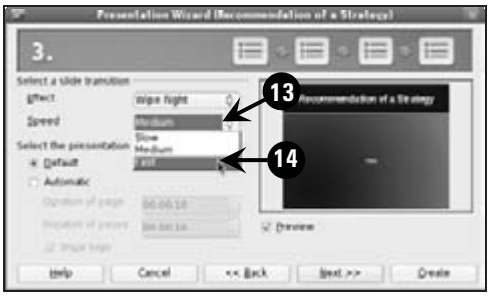


Fig.Impress-1.29

15. *Click* the **Next** button (Fig.Impress-1.30).

Section 4 appears in **Presentation Wizard** (Fig.Impress-1.31).

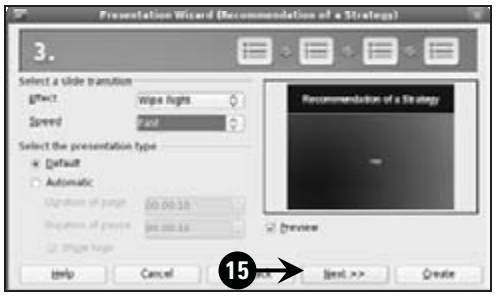


Fig.Impress-1.30



Fig.Impress-1.31

16. *Type* your name or company name in the **What is your name or the name of your company?** text box. In our case, we have typed Kogent Learning Solutions Inc. (Fig.Impress-1.32).
17. *Type* the subject of your presentation under the **What is the Subject of your presentation?** text box. In our case, we have typed **Recommendation of a Strategy** (Fig.Impress-1.32).
18. Type the ideas to be presented on the presentation under the **Further ideas to be presented**? text box. In our case, we have typed **Linux Project Plan Strategy** (Fig.Impress-1.32).
19. *Click* the **Next** button (Fig.Impress-1.32).

Section 5 appears in **Presentation Wizard** (Fig.Impress-1.33).

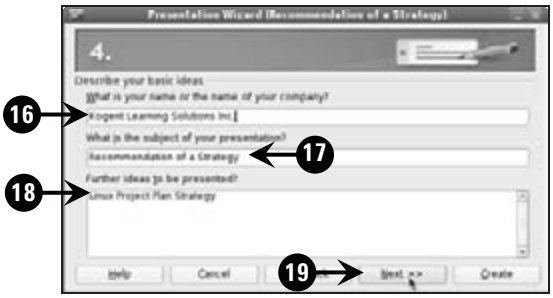


Fig.Impress-1.32



Fig.Impress-1.33

20. *Select* he **Overview** option under the **Choose your pages** section (Fig.Impress-1.34). The overview of the strategy appears in the **Preview** pane (Fig.Impress-1.34).
21. *Click* the **Create** button, as shown in (Fig.Impress-1.34).



Fig.Impress-1.34

The presentation using templates is created as per your specifications and shown in Fig.Impress-1.35:

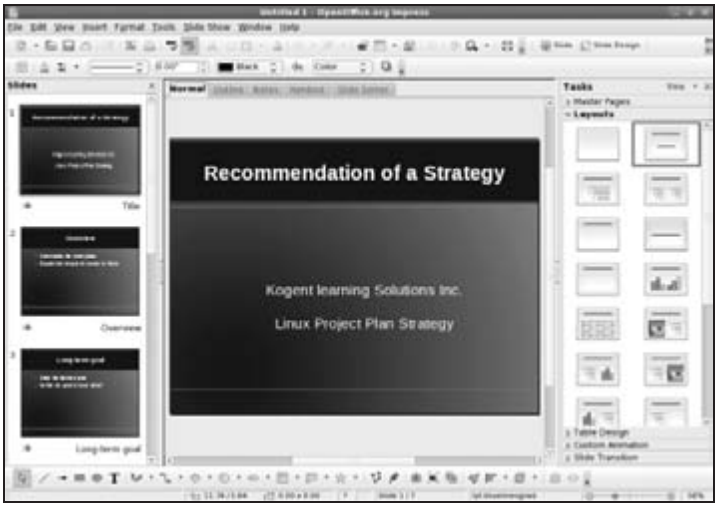


Fig.Impress-1.35

After learning how to create a presentation using templates, let's now learn how to close the OpenOffice.org Impress presentation.

Closing the OpenOffice.org Impress Presentation and Quitting the Impress

After completing the work in the presentation, you can close the presentation and quit Impress. You must save your presentation before closing it; otherwise, you may lose your data.

Let's perform the following steps to close a presentation:

1. *Select* the **File** menu from the menu bar. A drop-down list appears (Fig.Impress-1.36).
2. *Select* the **Exit** option from the drop-down list, as shown in Fig.Impress-1.36:

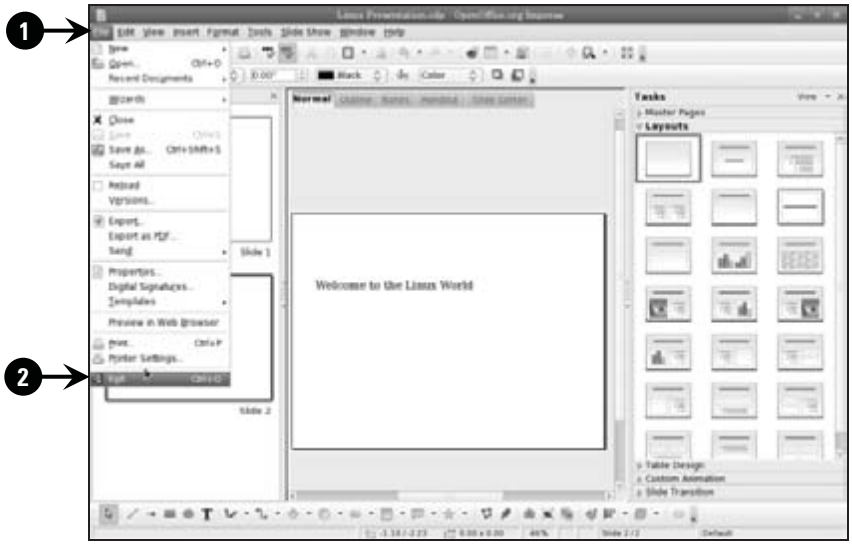


Fig.Impress-1.36

The OpenOffice.org Impress application window is closed.

With this we come to the end of this chapter. Before moving ahead for the next chapter, let's summarize the main points of this chapter.

Summary

In this chapter, you have learned to open OpenOffice.org Impress and explored the components of its interface. Further, you have learned to insert a new slide in your presentation. You have also learned to insert text in a slide and save the presentation. In addition, you have learned to create a presentation using templates. Finally, you close the presentation and quit OpenOffice.org Impress.

CHAPTER

2

Working with Presentations

In this Chapter:

- Opening an Existing Presentation
- Formatting the Text
- Working with Text Effects
- Inserting Objects in a Slide
- Applying the Slide Animation Effect
- Applying the Slide Transition Effect
- Running a Slide Show
- Setting Options for a Slide Show
- Moving and Deleting the Slides
- Saving the Existing Presentation
- Printing the Presentation

OpenOffice.org Impress helps you to prepare a presentation. You can create audio or graphical presentation. You can add charts, diagrams, and objects in a presentation to make it effective, creative, and easy to understand. In OpenOffice.org Impress, you can apply effects, such as transition and animation effects, to make your presentation more attractive and user friendly. You can also add the sound and video clip in your presentation. If you want to change the format of the text in a slide, you can change the font style, font size, and font color of the text.

In this chapter, you learn how to open an existing presentation. Next, you learn how to change the format, such as font size, font style, and font color, of text. Further, you learn how work with the Fontwork style. You also learn how to insert objects, such as an OLE object, picture and chart, in a slide. In addition, you learn to add and remove the text, slide transition and animation effects in the presentation. You also learn how to run the presentation. Next, you learn how to set options for the slide show as well as moving and deleting the slides. Finally, you learn to save the existing presentation and printing the presentation.

To work with an application, you first need to open it. So, let's begin by opening an existing presentation in Impress.

Opening an Existing Presentation

You can open an existing presentation in Impress from either its location by double-clicking it or the OpenOffice.org Impress application.

Let's perform the following steps to learn how to open an existing presentation:

1. *Select* the **Applications** menu from the top panel of the desktop. A drop-down menu appears (Fig.Impress-2.1).
2. *Select* the **Office** option from the drop-down menu. A sub-menu appears (Fig.Impress-2.1).
3. *Select* the **OpenOffice.org Impress** option from the sub-menu, as shown in Fig.Impress-2.1:

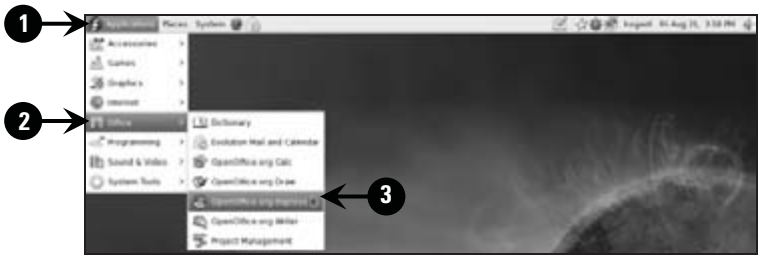


Fig.Impress-2.1

Presentation Wizard appears (Fig.Impress-2.2). The **Empty presentation** radio button is selected by default, as shown in Fig.Impress-2.2:

4. *Select* the **Open existing presentation** radio button (Fig.Impress-2.3). A list of existing presentations appears below the **Open** button.
5. *Select* the presentation that you want to open from the list. In our case, Linux Presentation is selected by default (Fig.Impress-2.3).
6. *Click* the **Create** button (Fig.Impress-2.3).



Fig.Impress-2.2

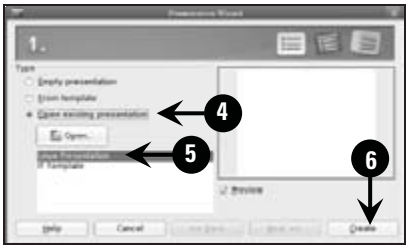


Fig.Impress-2.3

The selected presentation opens (Fig.Impress-2.4).

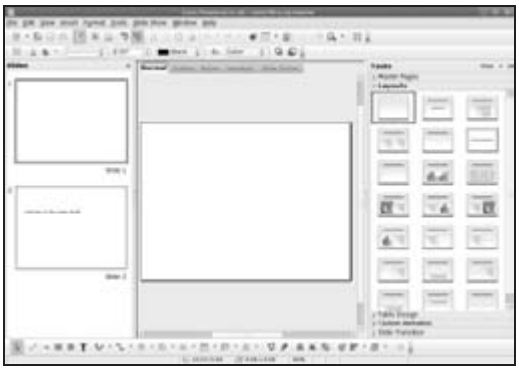


Fig.Impress-2.4

After learning to open an existing presentation, let's now learn to format the text.

Formatting the Text

You can format the text in your presentation to make it more readable and attractive by changing its font family, font size, font position, font effect, font color, and inserting bulleted list. In this section, you learn to:

- Change the font style of the text
- Change the font size of the text
- Change the font color of the text
- Insert a bulleted list

Let's begin with changing the font style first.

Changing the Font Style

Impress allows you to modify the appearance of text by changing its font style. Let's perform the following steps to change the font style of the text:

1. *Select* the text of which you want to change the font style (Fig.Impress-2.5).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.5).
3. *Select* the **Character** option from the drop-down menu, as shown in Fig.Impress-2.5:

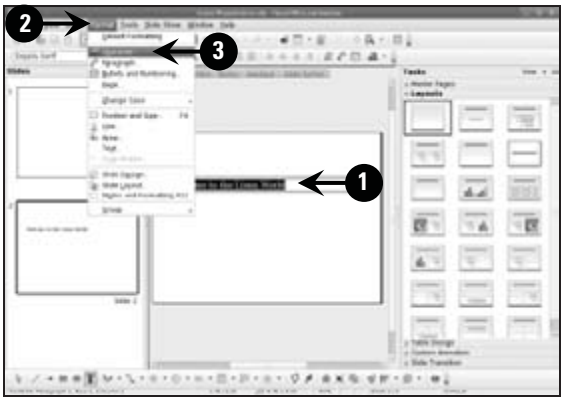


Fig.Impress-2.5

The **Character** dialog box appears (Fig.Impress-2.6). The Font tab is open by default.

4. *Select* the font style under the **Typeface** section. In our case, we have selected the **Bold** typeface (Fig.Impress-2.6).
5. *Click* the **OK** button (Fig.Impress-2.6).

   The font style is applied to the selected text (Fig.Impress-2.7).

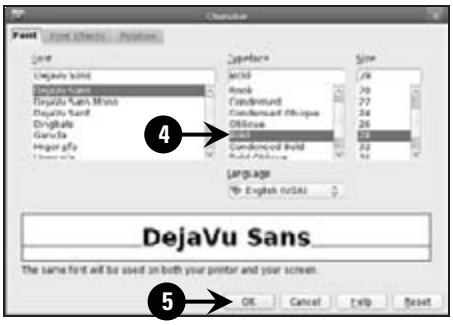


Fig.Impress-2.6

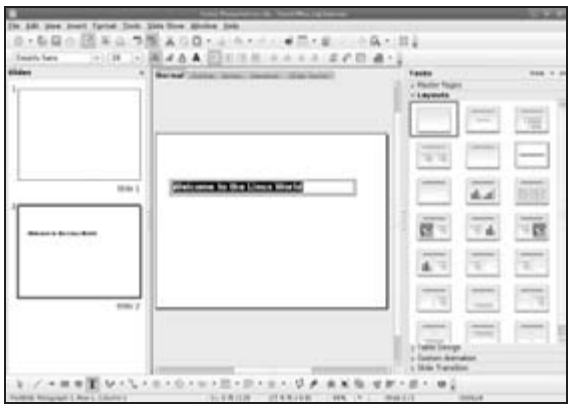


Fig.Impress-2.7

After changing the font style, let's now learn to change the font size.

Changing the Font Size

You can also change the font size of your text. A large-sized font is generally used to highlight information, such as headings; whereas, a small-sized font is used for presenting general information, annotations, bookmarks, or notes. The size of the font is measured in Points (pt).

Let's perform the following steps to learn how to change the font size:

1. *Select* the text. In our case, we have selected the **Welcome to the Linux World** text (Fig.Impress-2.8).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.8).
3. *Select* the **Character** option from the drop-down menu, as shown in Fig.Impress-2.8:

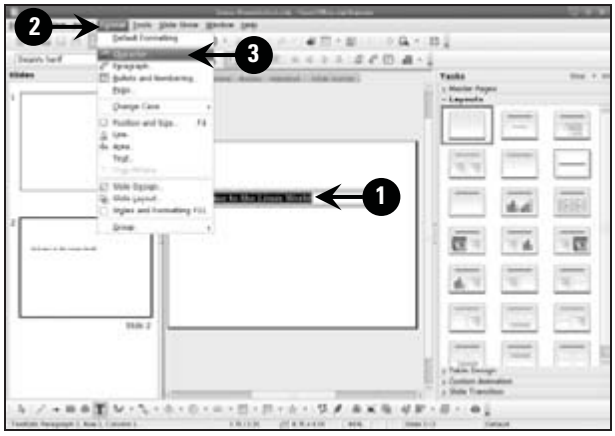


Fig.Impress-2.8

The **Character** dialog box appears (Fig.Impress-2.9).

4. *Select* the font size for the selected text under the **Size** section. In our case, we have selected the **36** (pt) font size (Fig.Impress-2.9).
5. *Click* the **OK** button (Fig.Impress-2.9).

The font size is applied to the selected text (Fig.Impress-2.10).

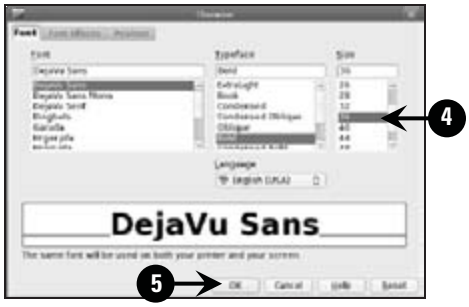


Fig.Impress-2.9

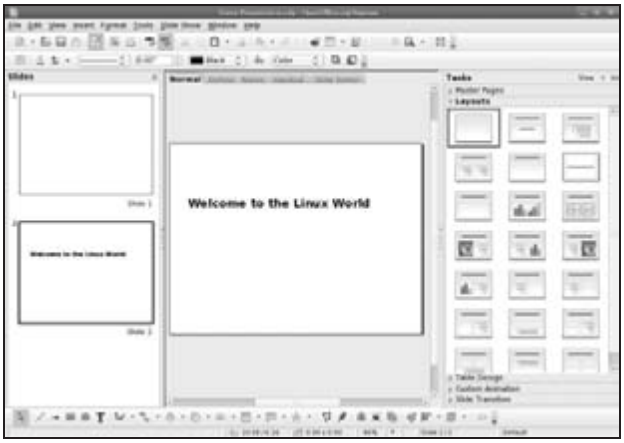


Fig.Impress-2.10

Let's now learn how to change the font color.

Changing the Font color

Changing the text color means changing the default color (black) of the text to another color. In all applications of the OpenOffice.org suite, including Impress, there is a built-in color scheme, which can be used to change the color of the text to make it more attractive.

Let's perform the following steps to learn how to change the font color:

1. *Select* the text. In our case, we have selected **Welcome to the Linux World** (Fig.Impress-2.11).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.11).
3. *Select* the **Character** option from the drop-down menu, as shown in Fig.Impress-2.11:

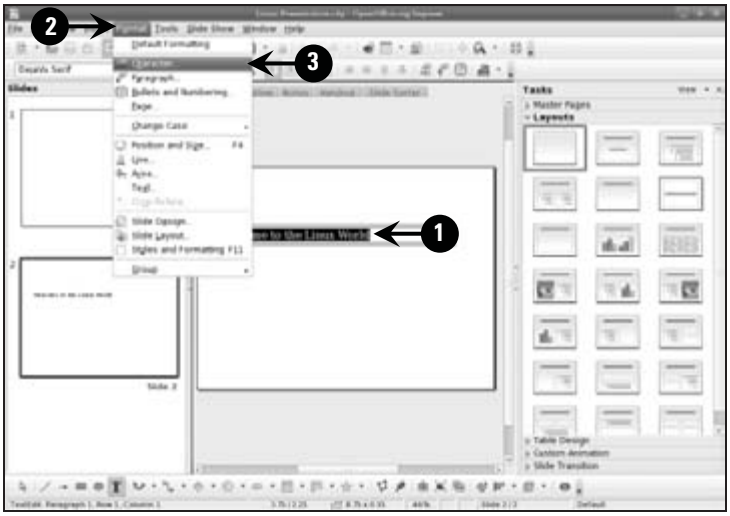


Fig.Impress-2.11

The **Character** dialog box appears (Fig.Impress-2.12). The Font tab is open by default (Fig.Impress-2.12).

4. *Select* the **Font Effects** tab to open its pane (Fig.Impress-2.13).

5. *Click* the up-down arrow button under the **Font Color** section. A list of different colors appears (Fig.Impress-2.13).
6. *Select* the desired font color. In our case, we have selected the **Blue** color (Fig.Impress-2.13).
7. *Click* the **OK** button (Fig.Impress-2.13).



Fig.Impress-2.12

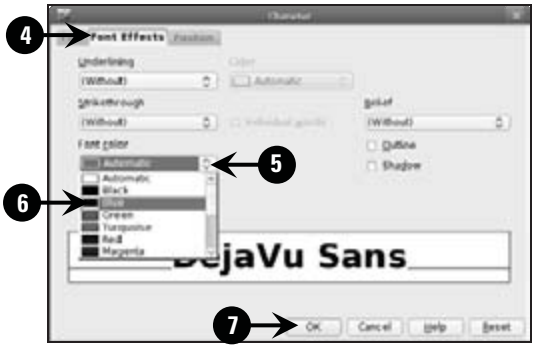


Fig.Impress-2.13

The font color is applied to the selected text, as shown in Fig.Impress-2.14:



Fig.Impress-2.14

Let's now learn how to insert a bulleted list in the presentation.

Inserting the Bulleted List

While working on a presentation, you might require to highlight the key areas of the text in the form of lists. Impress provides you with the option of bulleted and numbered lists. Bulleted lists contain various styles of bullets, such as dots, arrow marks, and small circles; whereas, numbered lists contain numbers.

Let's perform the following steps to insert a bulleted list in a presentation:

1. *Select* a slide from the **Slide pane**. In our case, we have selected slide 1 and it appears in the workspace (Fig.Impress-2.15).
2. *Type* some text in slide 1, as shown in Fig.Impress-2.15:

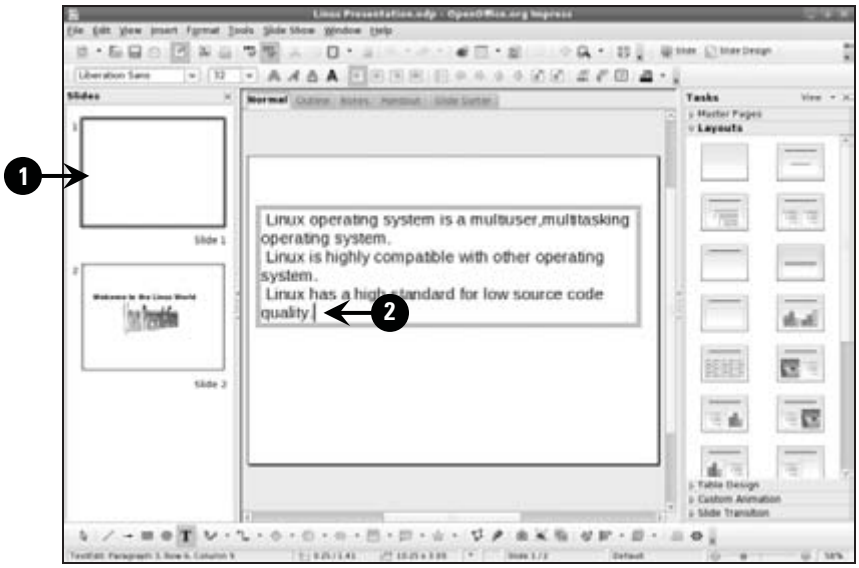


Fig.Impress-2.15

3. *Select* the paragraph to insert the bulleted list (Fig.Impress-2.16).
4. *Select* the **Format** menu from the menu bar. A drop-down menu appears.
5. *Select* the **Bullets and Numbering** option from the drop-down menu, as shown in Fig.Impress-2.16:

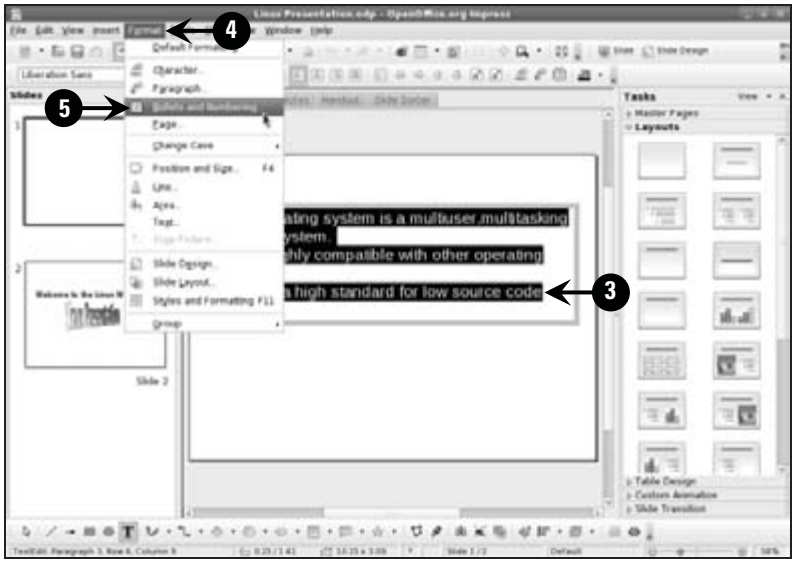


Fig.Impress-2.16

The **Bullets and Numbering** dialog box appears (Fig.Impress-2.17).

6. *Select* the desired bulleted list style (Fig.Impress-2.17). In our case, we have selected the **Solid diamond** bulleted style.
7. *Click* the **OK** button, as shown in Fig.Impress-2.17:

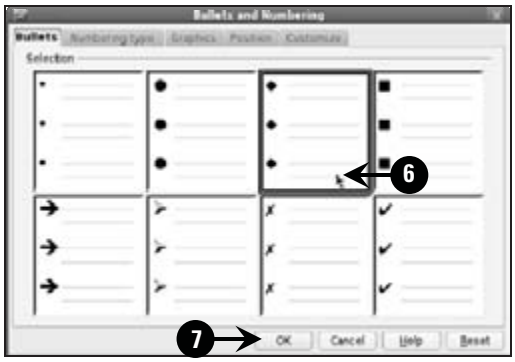


Fig.Impress-2.17

The selected bulleted list is applied to the paragraph, as shown in Fig.Impress-2.18:

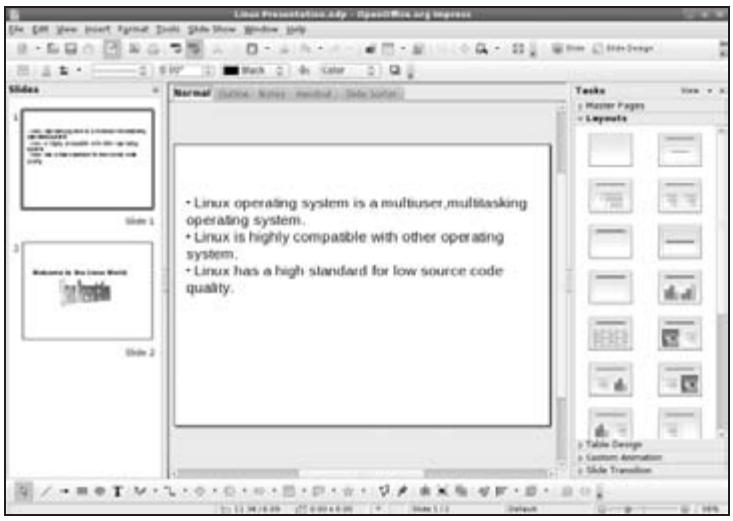


Fig.Impress-2.18

After learning about inserting the bulleted lists, let's now learn to apply text effects in the presentation.

Working with Text Effects

In OpenOffice.org Impress, you can use the Fontwork style to create graphical text to make your presentation more attractive. There are different settings to create text art objects, such as line, area, position, and size. In this section, you learn to create Fontwork style and edit it.

Let's begin with creating a Fontwork object first.

Creating a Fontwork Object

You can create graphical text art using the fontwork object to make the text more attractive and bright. You may create graphical text with the help of fontwork object either by directly clicking the fontwork gallery icon from the drawing toolbar or selecting View→Toolbars→Fontwork.

Let's perform the following steps to create a fontwork object by using the drawing toolbar:

1. *Select* the slide in which you want to create a fontwork object. In our case, we have selected **Slide 2**. The slide 2 appears in the workspace.
2. *Click* the **Fontwork Gallery** icon in **Drawing Toolbar**, as shown in Fig.Impress-2.19:



Fig.Impress-2.19

The **Fontwork Gallery** dialog box appears (Fig.Impress-2.20). The **Favorite 1** fontwork style is selected by default (Fig.Impress-2.20).

3. *Select* the desired fontwork style from the fontwork gallery dialog box. In our case, we have selected the **Favorite 16** fontwork style (Fig.Impress-2.21).
4. *Click* the **OK** button to close the Fontwork Gallery dialog box (Fig.Impress-2.21).

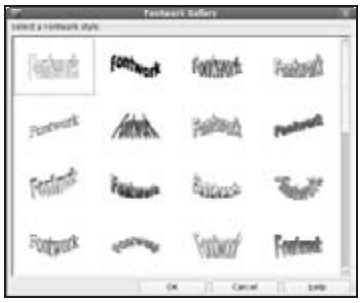


Fig.Impress-2.20

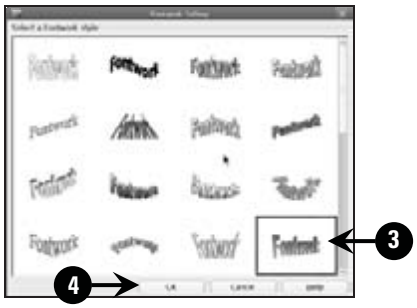


Fig.Impress-2.21

The selected fontwork object appears in your slide. The blue color dots around the edge of the fontwork object indicate that the object is selected (Fig.Impress-2.22).

5. *Double-click* the object to edit the fontwork text. A black fontwork text appears over the object, as shown in Fig.Impress-2.22:

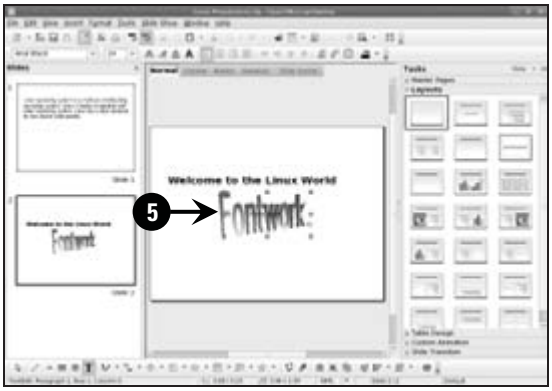


Fig.Impress-2.22

6. *Type* your own text in place of that black text (Fig.Impress-2.23). In our case, we have typed **Linux Presentation**, as shown in Fig.Impress-2.23:

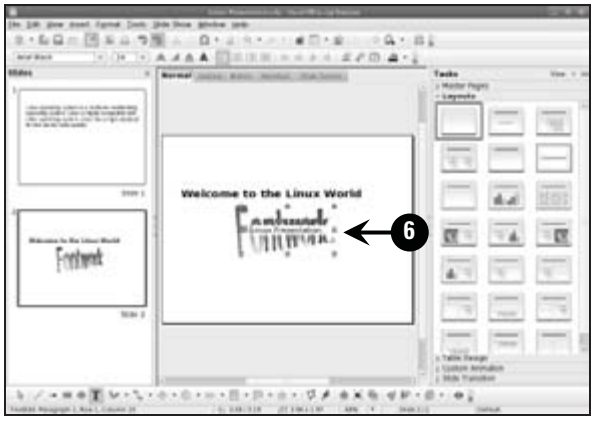


Fig.Impress-2.23

7. *Click* anywhere in the slide. The typed text appears as Fontwork style, as shown in Fig.Impress-2.24:

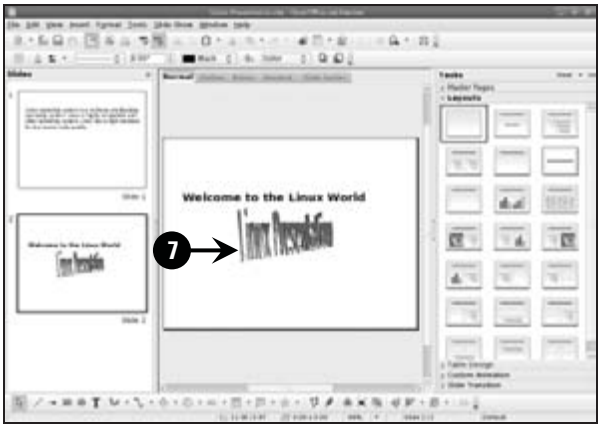


Fig.Impress-2.24

After learning to create a fontwork object, let's learn how to edit it.

Editing the Fontwork Object

After creating the fontwork object, you can edit it by using Fontwork Toolbar. Fontwork Toolbar provides you with the options to change the shape and alignment of the fontwork object. It also allows you to move and resize the fontwork objects.

Fontwork Toolbar consists of the following icons:

- **Fontwork Shape** ( ): Edits the shape of the selected object. You can select the desired shape from a palette of shapes.
- **Fontwork Same Letter Heights** ( ): Changes the height of characters in the object.
- **Fontwork Alignment** ( ): Changes the alignment of characters. When you click the down-arrow button, it provides various options, such as left align, center, right align, word justify, and stretch justify. The effects of the text alignment can only be seen if the text spans over two or more lines.
- **Fontwork Character Spacing** ( ): Changes the character spacing in the object.

Let's now learn how to use Fontwork Toolbar.

Using Fontwork Toolbar

You can use Fontwork Toolbar to change the size and shape of the fontwork object.

Let's perform the following steps to use Fontwork Toolbar:

1. Select the fontwork object whose shape you want to change (Fig.Impress-2.25).
2. *Select* the **View** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.25).
3. *Select* the **Toolbars** option from the drop-down menu. A sub-menu appears (Fig.Impress-2.25).
4. *Select* the **Fontwork** check box (Fig.Impress-2.25).
   The Fontwork Toolbar appears (Fig.Impress-2.26).

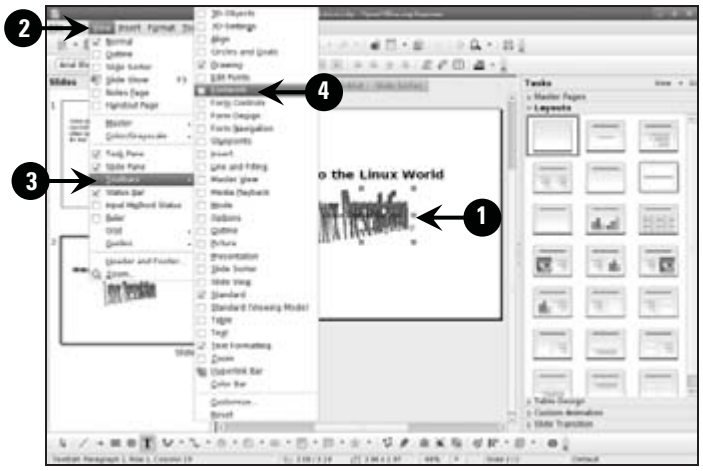


Fig.Impress-2.25



Fig.Impress-2.26

5. *Click* the **Fontwork shape** icon to change the shape of the selected fontwork object. A list of shapes appears (Fig.Impress-2.27).
6. *Select* the desired shape from the list. In our case, we have selected the **Chevron Up** shape, as shown in Fig.Impress-2.27:

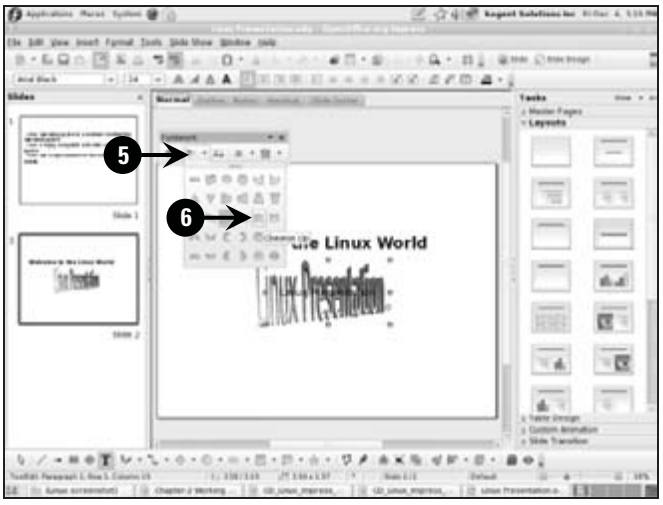


Fig.Impress-2.27

The shape of the selected fontwork object gets changed, as shown in Fig.Impress-2.28:



Fig.Impress-2.28

After learning to use Fontwork Toolbar, let's learn to move and resize the fontwork object.

Moving and Resizing the Fontwork Object

When you select a fontwork object, eight blue squares (known as handles) appear around the edge of the object. You can drag these handles to resize the object. A yellow dot, representing the edge of the object, also appears on the object. If you place the mouse pointer over this yellow dot, the pointer turns into a hand symbol. You can drag the dot in different directions to distort the object.

Let's perform the following steps to move and resize a fontwork object:

1. *Drag* the yellow dot of the selected object and resize the object, as shown in Fig.Impress-2.29:



Fig.Impress-2.29

The fontwork object shifts to a new location and gets resized, as shown in Fig.Impress-2.30:



Fig.Impress-2.30

After learning how to format the text, let's now learn how to insert objects in a slide.

Inserting Objects in a Slide

In OpenOffice.org Impress, you can insert various types of objects in a slide, such as movie and sound, Writer documents, Math formulas, and generic Object Linking and Embedding(OLE) objects.

Let's perform the following steps to insert a movie clip or sound in a slide:

1. *Select* the slide in which you want to insert objects. In our case, we have selected **Slide 1**. The slide 1 appears in the workspace (Fig.Impress-2.31).
2. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.31).
3. *Select* the **Movie and Sound** option from the drop-down menu, as shown in Fig.Impress-2.31:

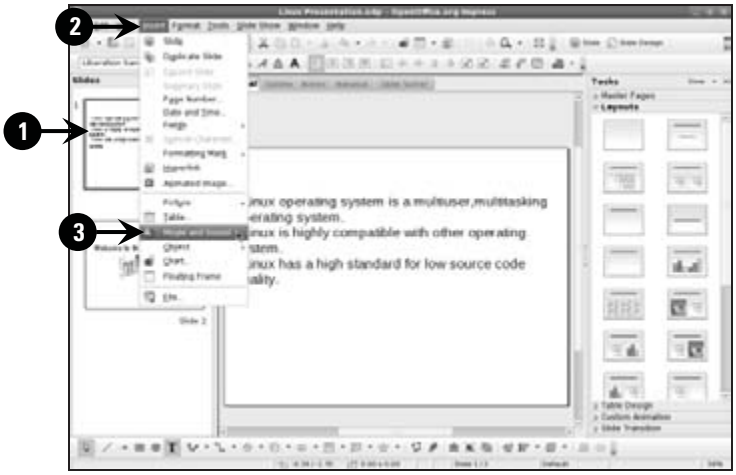


Fig.Impress-2.31

The **Insert Movies and Sound** dialog box appears (Fig.Impress-2.32).

4. *Select* the movie clip that you want to insert. In our case, we have selected the **lakh lakh** video song (Fig.Impress-2.32).
5. *Click* the **Open** button, as shown in Fig.Impress-2.32:



Fig.Impress-2.32

The video song icon appears in slide 1, as shown in Fig.Impress-2.33:

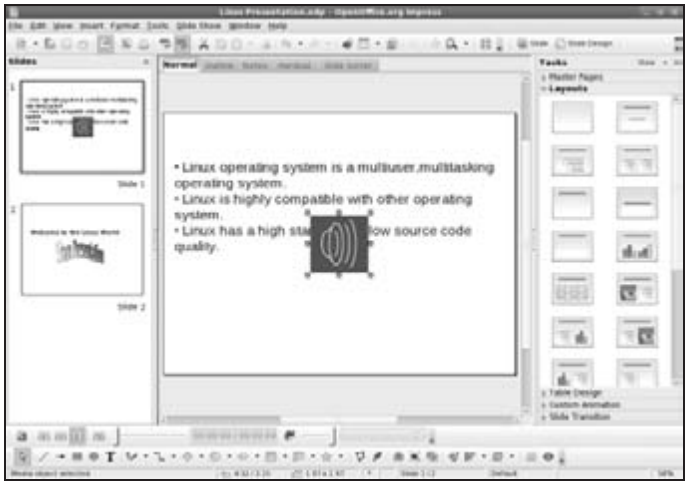


Fig.Impress-2.33

Let's now learn to insert the OLE object.

Inserting an OLE Object

OLE means inserting an object of an application in the other application. For example, using OLE you can insert a spreadsheet of a Calc program in a document created using Writer. The document in which the object is inserted is known as target document and the application whose object is inserted is known as source document. Whenever you need to make some changes to the object, the source application opens up where you can make necessary changes and object appears in the target document with recently changes.

Let's perform the following steps to learn how to insert an OLE object in a slide:

1. *Select* the slide in which you want to insert the OLE object. In our case, we have selected Slide 1 (Fig.Impress-2.34).
2. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.34)
3. *Select* the **Object** option from the drop-down menu. A sub-menu appears (Fig.Impress-2.34).
4. *Select* the **OLE Object** option from the sub-menu, as shown in Fig.Impress-2.34:

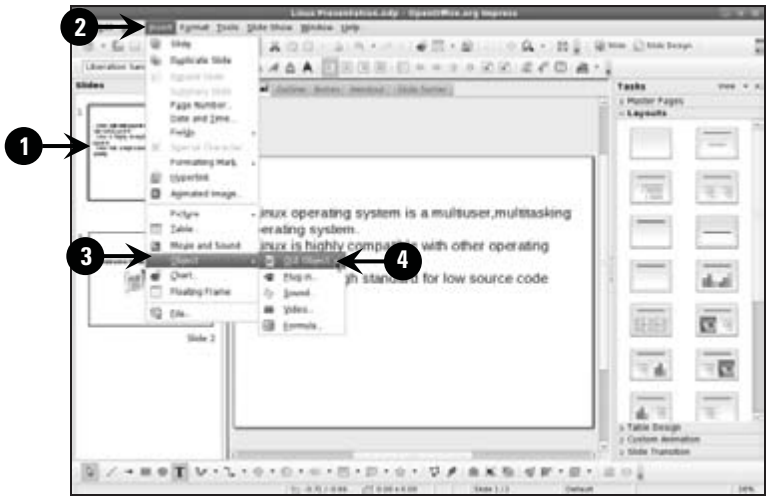


Fig.Impress-2.34

The **Insert OLE object** dialog box appears (Fig.Impress-2.35).

5. *Select* the desired radio button. In our case, the **Create new** radio button is selected by default (Fig.Impress-2.35).
6. *Select* the desired object type under the Object type section. In our case, we have selected the **OpenOffice.org 3.1 Spreadsheet** object type (Fig.Impress-2.35).
7. *Click* the **OK** button, as shown in Fig.Impress-2.35:

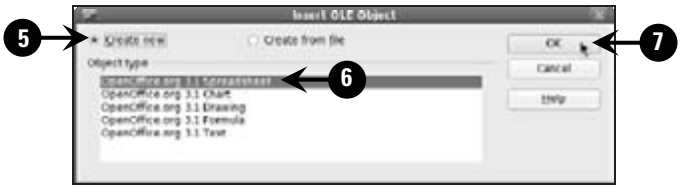


Fig.Impress-2.35

The **OpenOffice.org 3.1 Spreadsheet** OLE object is inserted in Slide 1 (Fig.Impress-2.36).

You can manually insert data in the newly created OLE object (Fig.Impress-2.37).

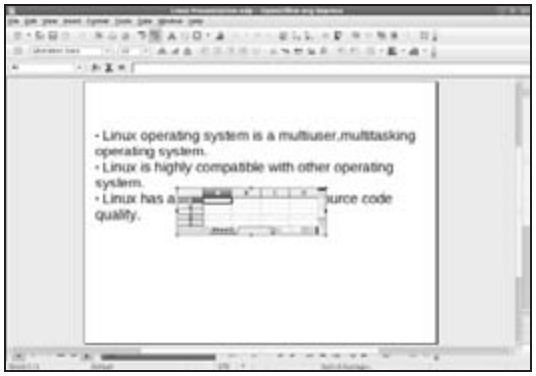


Fig.Impress-2.36

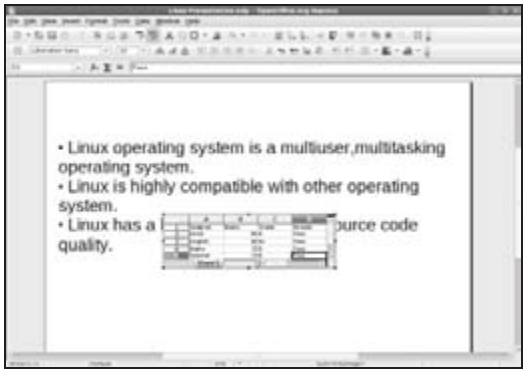


Fig.Impress-2.37

Let, now learn to insert pictures in a slide.

Inserting a Picture

In OpenOffice.org Impress, you can insert pictures in presentations as they quickly convey a large amount of information. The pictures also make the presentation more attractive.

Let's perform the following steps to insert pictures in the slide.

1. *Select* the slide in which you want to insert a picture. In our case, we have selected **Slide 2** (Fig.Impress-2.38).
2. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.38).
3. *Select* the **Picture** option from the drop-down menu. A sub-menu appears (Fig.Impress-2.38).
4. *Select* the **From File** option from the sub-menu, as shown in Fig.Impress-2.38:

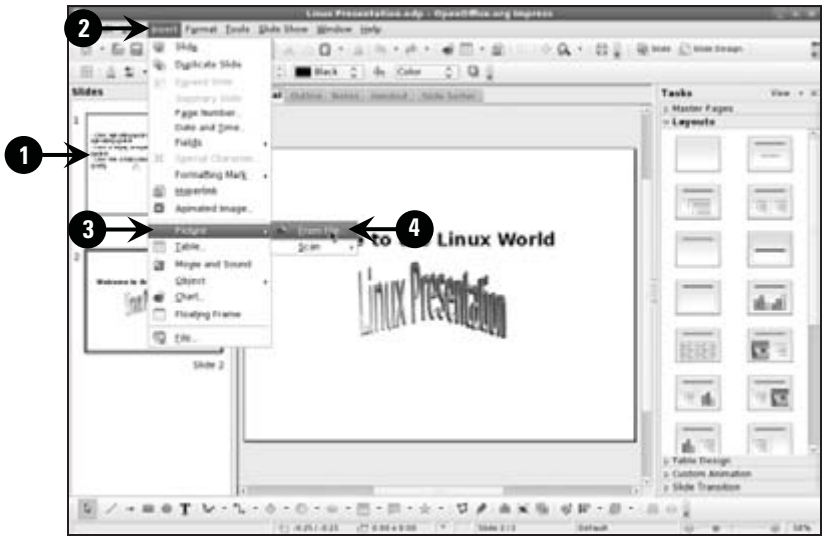


Fig.Impress-2.38

The **Insert Picture** dialog box appears (Fig.Impress-2.39).

5. *Select* the picture that you wish to insert. In our case, we have inserted the **1237271899.jpg** picture (Fig.Impress-2.39).
6. *Click* the **Open** button, as shown in Fig.Impress-2.39:

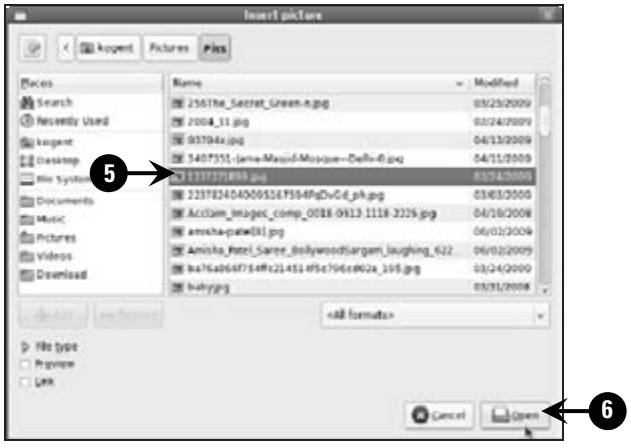


Fig.Impress-2.39

The selected picture gets inserted in slide 2, as shown in Fig.Impress-2.40:

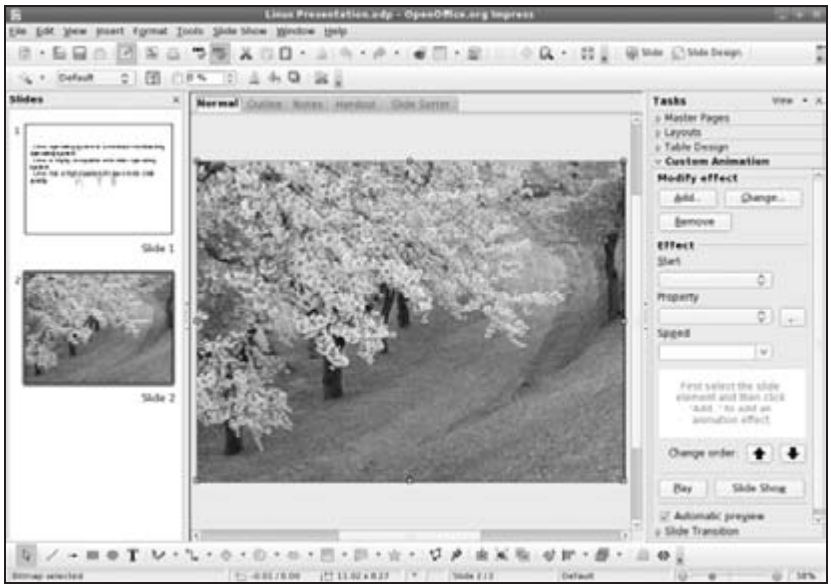


Fig.Impress-2.40

7. *Right-click* the inserted picture to insert the background text in it. A context menu appears (Fig.Impress-2.41).
8. *Select* the **Arrange** option from the context menu. A sub-menu appears (Fig.Impress-2.41).
9. *Select* the **Send to Back** option from the sub-menu, as shown in Fig.Impress-2.41:

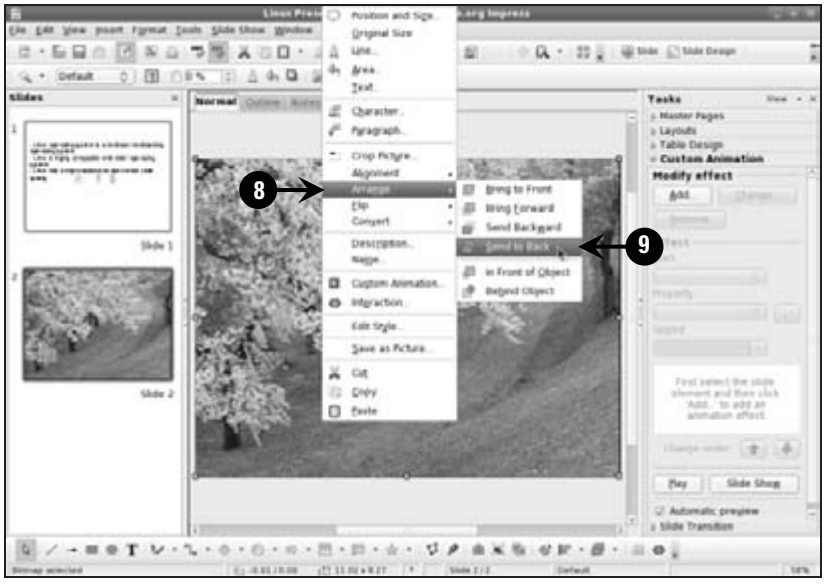


Fig.Impress-2.41

The text appears over the picture in the slide, as shown in Fig.Impress-2.42:

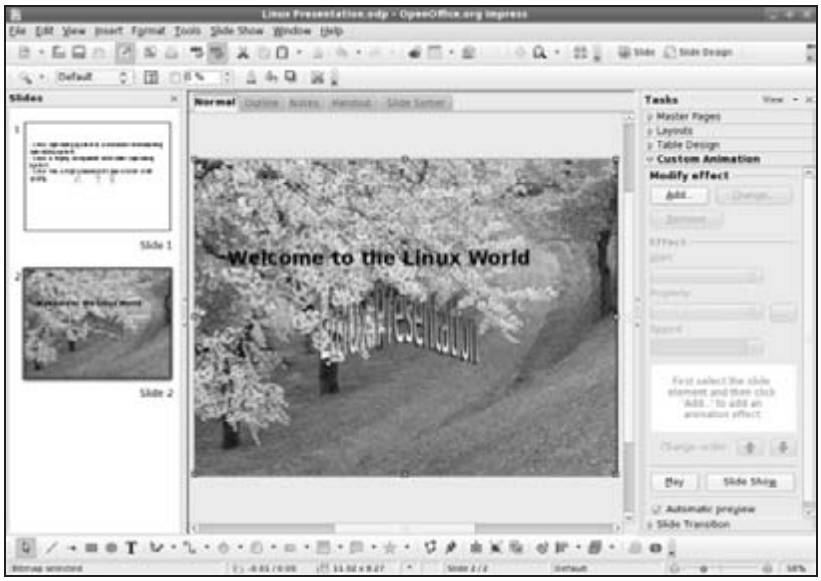


Fig.Impress-2.42

After learning to insert picture in the slide, let's now learn to insert a chart in your presentation.

Inserting a Chart

You can use the `Insert Chart` feature to add a chart in a slide. In our case, we are inserting a chart in the slide that we have selected in the preceding section. Let's perform the following steps to learn how to insert a chart in the slide:

1. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.43).
2. *Select* the **Chart** option from the drop-down list, as shown in Fig.Impress-2.43:

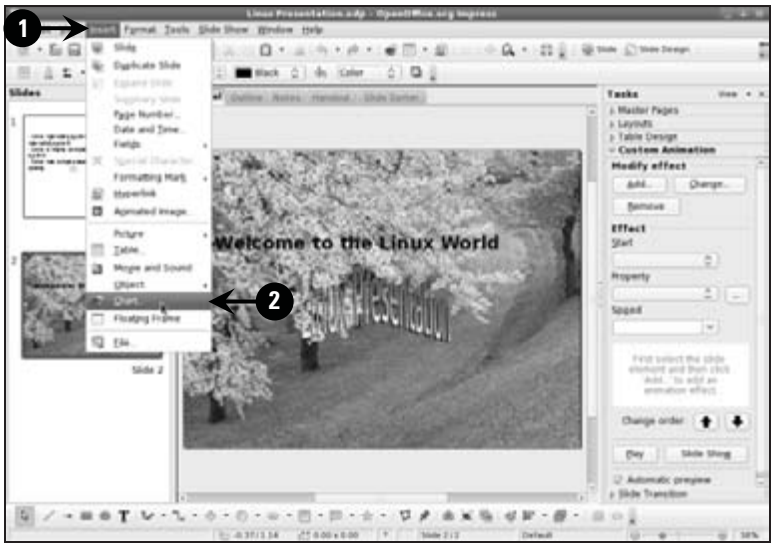


Fig.Impress-2.43

The chart gets inserted in the slide, as shown in Fig.Impress-2.44:



Fig.Impress-2.44



If you want to insert a full size chart, you can select the corresponding chart slide layout in the list of predefined layouts in the task pane.

After learning how to insert a chart in the slide, let's now learn to apply the slide animation effect to an individual element in a slide.

Applying the Slide Animation Effect

In Impress, you can create animated presentations by using the Animation feature. You can also control the animated objects by adding custom animation to them. The custom animation has the following two groups:

- **Modify effect:** Modifies the slide animation effect. The following are three buttons present in the Modify effect group:
  - **Add:** Enables you to add animation effects in a slide
  - **Change:** Enables you to change the existing slide animation effect
  - **Remove:** Enables you to remove the animation effect from a slide
- **Effects:** Enables you to apply the effects using the mouse click, direction, and the speed. The Effect group is divided in the following three sections:
  - **Start:** Enables you to start the presentation. The Start option has the following three categories:
    - **On click:** Stops the slide animation effect. If you want to start slide animation effect again, you need to click anywhere on the Impress window.
    - **With previous:** Runs the current animation simultaneously with the previous animation.
    - **After previous:** Runs the animation as soon as the previous animation ends.
- **Property:** Allows you to set the direction for slide animation effect.
- **Speed:** Enables you to set the speed for the slide.

Let's perform the following steps to apply the animation effect in a slide:

1. *Select* the slide you want to animate. In our case, we have selected Slide 2 (Fig.Impress-2.45).
2. *Select* the **Slide Show** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.45).
3. *Select* the **Custom Animation** option from the drop-down menu, as shown in Fig.Impress-2.45:

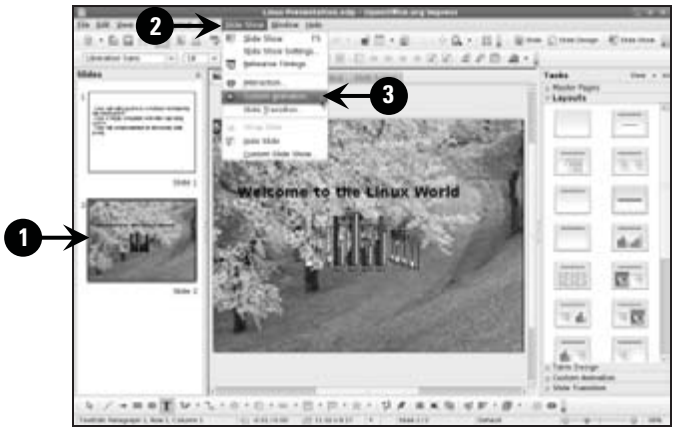


Fig.Impress-2.45

The Custom animation section appears in the Task pane (Fig.Impress-2.46).

4. *Click* the **Add** button under the **Modify effect** section, as shown in Fig.Impress-2.46:

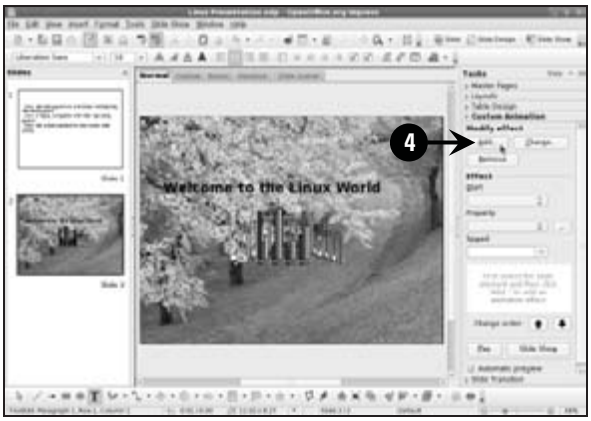


Fig.Impress-2.46

The Custom Animation dialog box appears (Fig.Impress-2.47).

5. *Select* an effect from the listed animation effects in the dialog box. In our case, we have selected the **Wedge** effect (Fig.Impress-2.48).
6. *Click* the down arrow button beside the Speed list box. A list of speed options appears (Fig.Impress-2.48).



Fig.Impress-2.47

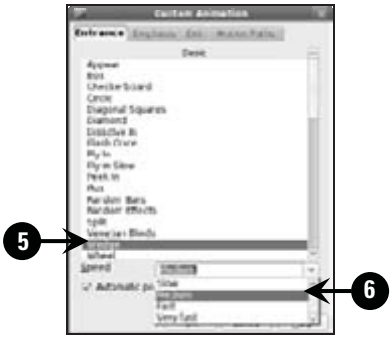


Fig.Impress-2.48

7. *Select* the speed for the slide animation effect. In our case, we have selected the Medium option (Fig.Impress-2.49).
8. *Select* the **Emphasis** tab in the Custom Animation dialog box to select an effect, such as a different font color or blinking text (Fig.Impress-2.50).

   The **Emphasis** tab opens. The Change Fill Color option is selected by default (Fig.Impress-2.50).



Fig.Impress-2.49



Fig.Impress-2.50

9. *Select* the desired option from the Emphasis tab. In our case, we have selected the **Transparency** option from the Basic section, as shown in Fig.Impress-2.51:

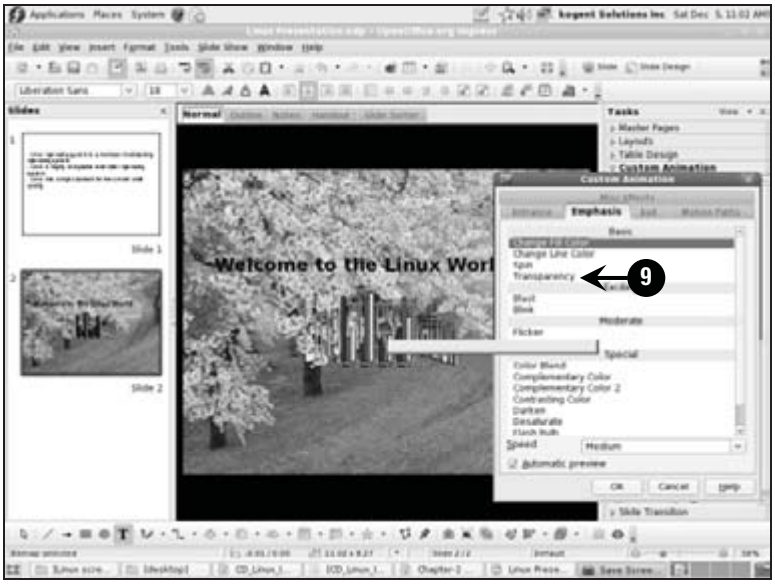


Fig.Impress-2.51

10. *Select* the **Exit** tab in the Custom Animation dialog box (Fig.Impress-2.52).
11. *Select* the desired effect under the **Basic** section. In our case, we have selected the **Diamond** effect, as shown in Fig.Impress-2.52:

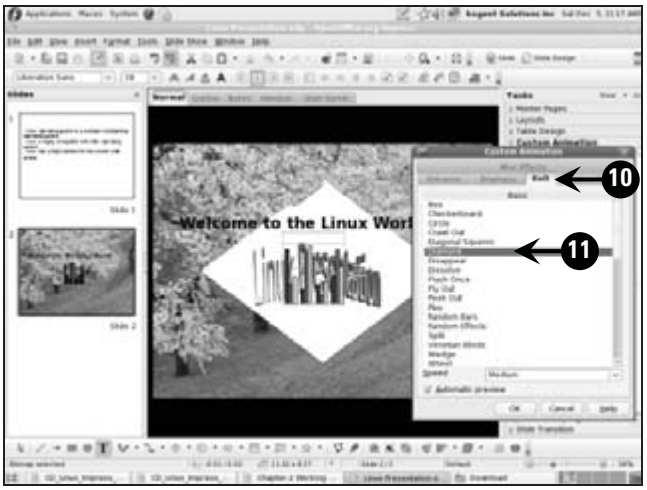


Fig.Impress-2.52

12. *Select* the **Motion Paths** tab in the Custom Animation dialog box. The Motion Paths tab opens (Fig.Impress-2.53).
13. *Select* the **Polygon** option under the **User paths** section in the Motion Paths tab (Fig.Impress-2.54).
14. *Click* the **OK** button (Fig.Impress-2.54).



Fig.Impress-2.53

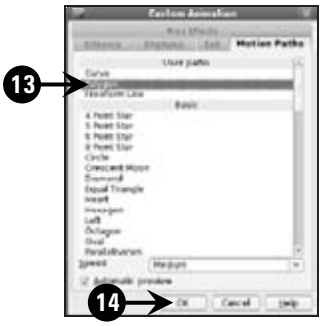


Fig.Impress-2.54

The presentation window appears, as shown in Fig.Impress-2.55:



Fig.Impress-2.55

15. *Click* the up-down arrow button beside the **Start** list box under the **Effect** section. A drop-down menu appears, as shown in Fig.Impress-2.56:



Fig.Impress-2.56

16. *Select* an option from the **Start** list box to resume the animation effect. In our case, we have selected the **On click** option, as shown in Fig.Impress-2.57:



Fig.Impress-2.57

17. *Click* the down arrow button under the **Speed** list box. The list of speed options appears, as shown in Fig.Impress-2.58:



Fig.Impress-2.58

18. *Select* the speed from the **Speed** list box for the selected slide animation effect. In our case, we have selected the **Medium** speed (which is the default speed) to display the desired effect that is **Wedge**, as shown in Fig.Impress-2.59:



Fig.Impress-2.59

The custom animation effect is applied to the selected slide, as shown in Fig.Impress-2.60:



Fig.Impress-2.60



You can change the order of the slides by clicking the up-down arrow buttons beside the Change Order option in the custom animation section.

Let's now learn how to remove animation effect.

Removing the Slide Animation Effects

You can also remove the applied animation effects from your slide.

Let's perform the following steps to remove the animation effects from the slide:

1. *Select* the slide from which you want to remove the animation effect. In our case, we have selected **Slide 2**, as shown in Fig.Impress-2.61:



Fig.Impress-2.61

2. *Right-click* the **Bitmap 1** effect from the Task pane. A drop-down list appears (Fig.Impress-2.62).
3. *Select* the **Remove** option from the drop-down list. The animation effect of the selected slide gets removed, as shown in Fig.Impress-2.62:



Fig.Impress-2.62

The slide animation effect applied in Slide 2 gets removed, as shown in Fig.Impress-2.63:



Fig. Impress2.63

Let's now learn to apply slide transition effects.

Applying the Slide Transition Effect

Slide transition refers to the movement of slides in which one slide appears after another. Many different slide transitions are available in programs, such as PowerPoint or OpenOffice.org Impress. Slide transitions are the effects that take place when one slide gives way to the next in a presentation, such as roll down from the top or fly in from the left. They add dynamic flair to a slide show by using the transition effects between slides. You can add transitions in the Slide Sorter or Normal view. To see the effect of a selection, you need to be in the Normal view and select the Automatic preview check box on the Slide Transition page of the Tasks pane. You can apply a single type of transition effect to all the slides in a presentation, different transition effects to a single slide, or different transition effects to different slides.

Let's perform the following steps to add slide transition:

1. *Select* the slide to which you want to apply the slide transition effect. In our case, we have selected **Slide 2** (Fig.Impress-2.64).
2. *Select* the **Slide Show** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.64).
3. *Select* the **Slide Transition** option from the drop-down menu, as shown in Fig.Impress-2.64:

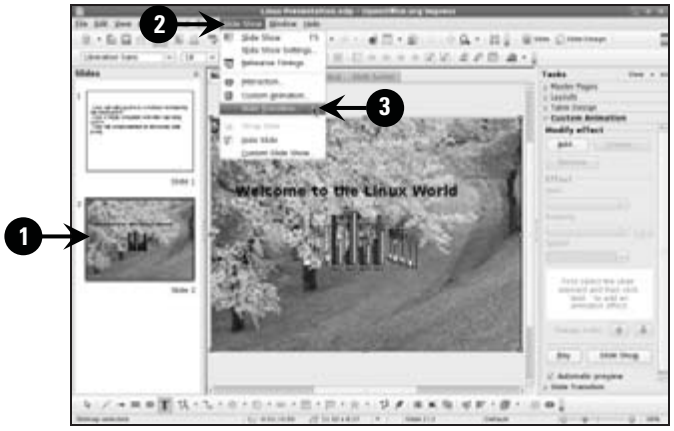


Fig.Impress-2.64

Different options for the slide transition appears in the Slide Transition drop-down list box. The No transition option is selected by default, as shown in Fig.Impress-2.65:



Fig.Impress-2.65

4. *Drag* the vertical scroll bar and select the desired slide transition. In our case, we have selected the **Wipe Left** slide transition option, as shown in Fig.Impress-2.66:



Fig.Impress-2.66

Now let's learn to modify a slide transition.

Modifying a Slide Transition

You can modify the selected transition by changing the speed or adding a sound in the Modify transition area.

Let's perform the following steps to learn to modify the slide transition by changing speed:

1. *Click* the up-down arrow button beside the **Speed** option. A list of option appears, as shown in Fig.Impress-2.67:



Fig.Impress-2.67

2. *Select* the desired option from the Speed list box. In our case, we have selected the **Fast** option, as shown in Fig.Impress-2.68:



Fig.Impress-2.68

This makes the slide transition fast.

Similarly, you can add different transition sounds in your presentation.

Let's perform the following steps to add sound while transitioning the slides in your presentation:

1. *Click* the up-down arrow button, beside the **Sound** list box. A list of sound options appears, as shown in Fig.Impress-2.69:



Fig.Impress-2.69

2. *Drag* the vertical scroll bar and select the desired sound from the **Sound** list box. In our case, we have selected the **applause** option, as shown in Fig.Impress-2.70:



Fig.Impress-2.70

A sound file is added in the presentation. Whenever the user advances to another slide, an applause sound will be heard by the audience.

Introducing Advance Slide

The Advance Slide option enables you to control the transition of slides. The two options available for this transition are the **Automatically after** and **On mouse click**. If you select the **Automatically after** option, you must specify an amount of time in seconds. For example, if you set the advance time to 10 seconds, Impress automatically advances the slide after 10 seconds. The **On mouse click** option lets you view each slide by clicking the left mouse button.

Let's perform the following steps to specify the time for the transition of slides:

1. *Select* the **Automatically after** radio button, as shown in Fig.Impress-2.71:



Fig.Impress-2.71

The time duration for slide transition is set to 1 sec, by default (Fig.Impress-2.71). However, you can manually specify the time duration for the slide transition.

2. *Click* the up-down arrow button to increase the slide transition effect. In our case, we have specified the time duration of **2 sec**, as shwon in Fig.Impress-2.72:

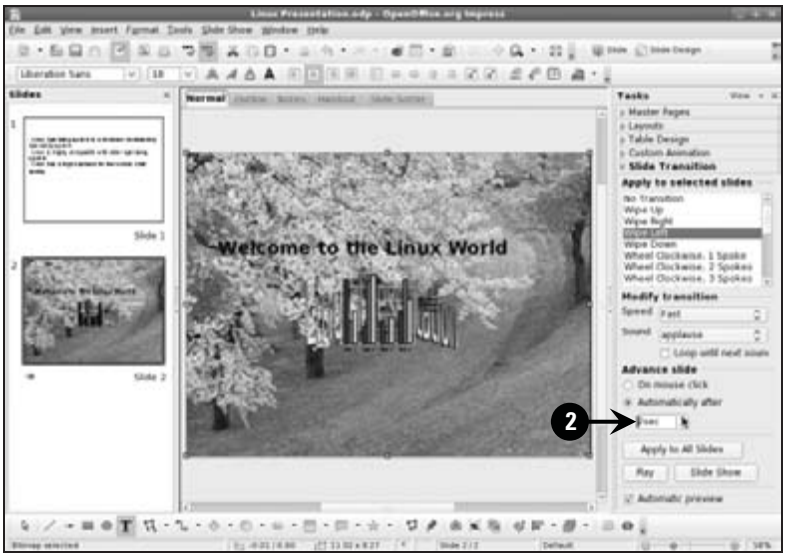


Fig.Impress-2.72



You can use the up arrow button to maximize the time amount for the slide transition and the down arrow button to minimize the time amount for the slide transition.

3. *Click* the **Apply to All Slides** button to apply the slide transition effects for all slides, as shown in Fig.Impress-2.73:



Fig.Impress-2.73

4. *Click* the **Play** button to preview the applied slide transition effects, as shown in Fig.Impress-2.74:



Fig.Impress-2.74

5. *Click* the **Slide Show** button to view the slide show from the current slide (so that you can view all the transitions), as shown in Fig.Impress-2.75:



Fig.Impress-2.75

Now, let's learn to remove the transition effect.

Removing the Slide Transition Effect

Let's perform the following steps to remove the slide transition effect:

1. *Select* the desired slide to remove the transition effect. In our case, we have selected **Slide 2**, as shown in Fig.Impress-2.76:



Fig.Impress-2.76

2. *Select* the No Transition transition effect from the Apply to selected slides list box, as shown in Fig.Impress-2.77:



Fig.Impress-2.77

The slide transition effect gets removed from the selected slide, as shown in Fig.Impress-2.78:



Fig.Impress-2.78

After learning to remove the transition effect, let's learn to run a slide show.

Running a Slide Show

After you have completed the designing and composing of your OpenOffice.org Impress presentation, you can run it by using the Slide show option. You can also run the slide show by pressing the F5 key.

Let's perform the following steps to learn how to run a slide show:

1. *Select* the **Slide Show** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.79).
2. *Select* the **Slide Show** option from the drop-down menu, as shown in Fig.Impress-2.79:



Fig.Impress-2.79

Let's now learn to set options for a slide show.

Setting Options for a Slide Show

OpenOffice.org Impress enables you to start the slide show and select the type of presentation and pointer options. These setting options are divided in the following four sections:

- **Range**: Selects the slides that you want to include in your slide show. The range is divided in the following three subsections:

- **All Slides**: Includes all slides except the hidden slide
- **From**: Starts the show from the slide other than the first
- **Custom Slide Show**: Shows the slide in a different sequence that you have previously set up

❑ **Type**: Enables you to select the display of slides. The type is divided in the following three subsections:

- **Default:** Shows the full screen slide show and exits the show after the last slide
- **Window:** Runs the slide show in the OpenOffice.org program window and exits the show after the last slide
- **Auto:** Restarts the slide show after the last slide. Press the Esc key to stop the show. There is a box under the Auto option, which enables you to specify the time before the show starts. If you enter zero, the show starts immediately without showing a pause slide. Select the check box beside the Show logo option to display the OpenOffice.org logo on the pause slide.

❑ **Options:** Provides description of the options

- **Change slides manually:** Prevents slides from changing automatically.
- **Mouse Pointer Visible:** Shows the mouse pointer during a slide show.
- **Mouse pointer as pen:** Enables you to write or draw on slides during the presentation. Anything you write with the pen is not saved when you exit the slide show. The color of the pen cannot be changed.
- **Navigator Visible:** Displays the navigator during slide show.
- **Animation allowed:** Displays all frames of animated Graphics Interchange Format (GIF) files during the slide show.
- **Change slides by clicking on background:** Lets you switch to the next slide when you click at the background of the slide.
- **Presentation always on top:** Prevents any other program window from appearing on top of the presentation.

❑ **Multiple Monitors:** Enables you to work with multiple monitors, so that you can look at something else while presenting your slides on a projector.

Let's perform the following steps to set options for a slide show:

1. *Select* the **Slide Show** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.80).
2. *Select* the **Slide Show Settings** option from the drop-down menu, as shown in Fig.Impress-2.80:



Fig.Impress-2.80

The Slide Show dialog box appears (Fig.Impress-2.81).

3. *Select* the **From** radio button to include all the slides in the presentation, excluding the hidden slide (Fig.Impress-2.82).

   The list box beside the From radio button gets enabled (Fig.Impress-2.82).



Fig.Impress-2.81



Fig.Impress-2.82

4. *Click* the up-down arrow button of the list box. The list of slides appears (Fig.Impress-2.83).
5. *Select* the slide from where you want to start the presentation. In our case, we have selected **Slide 2** to start the slide show (Fig.Impress-2.83).
6. *Select* the radio button beside the **Auto** option under the **Type** section to restart the slide show after the last slide (Fig.Impress-2.84).

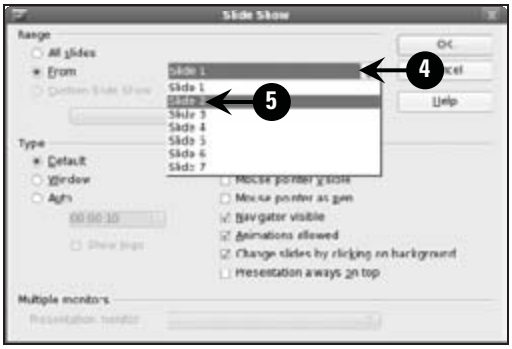


Fig.Impress-2.83



Fig.Impress-2.84

After learning about setting the slide options, let's now learn how to move and delete the slides.

Moving and Deleting the Slides

In this section, you learn to arrange the order of slides in the presentation and delete slides, which are no longer required in the presentation.

Let's begin with moving the slides in the presentation.

Moving the Slides

You can also change the position of slides to present them in a different order.

Let's perform the following steps to move the slides:

1. *Select* the desired slide from the slide pane. In our case, we have selected **slide 2**, as shown in Fig.Impress-2.85:

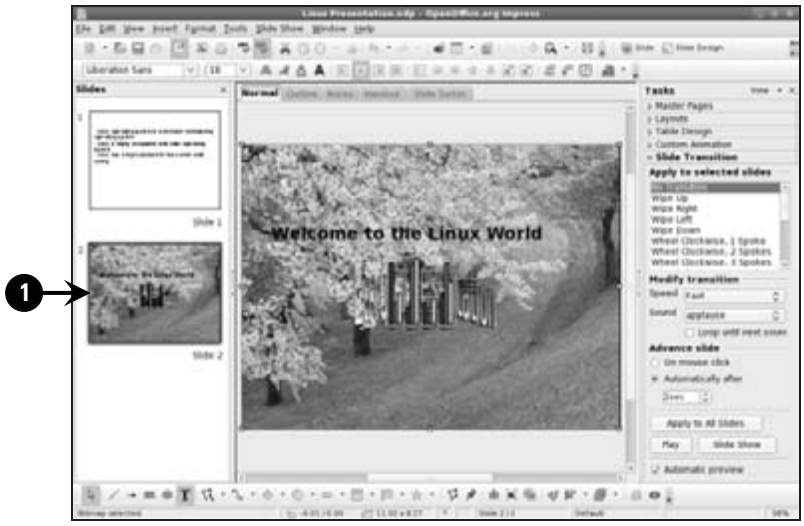


Fig.Impress-2.85

2. *Drag* the mouse to the slide that you want to reposition. The position of the slide has changed, as shown in Fig.Impress-2.86:

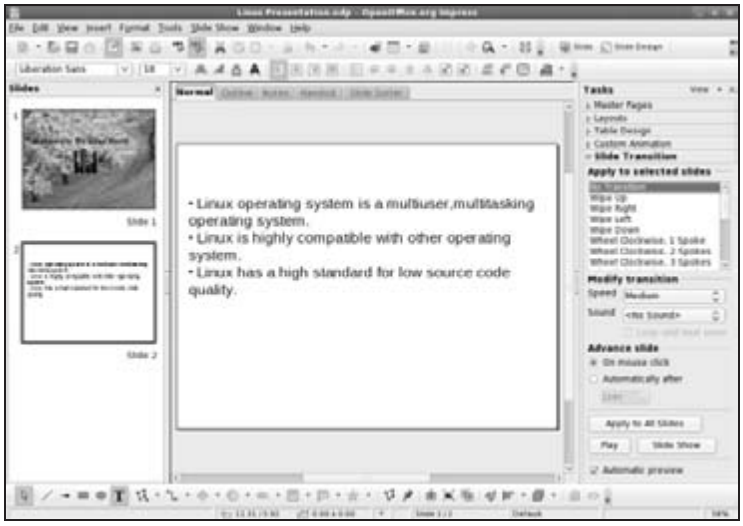


Fig.Impress-2.86

After learning the process of moving a slide, let's move towards the next section and learn to delete a slide.

Deleting the Slide

You can delete a slide from a presentation. You can also undo the slide deletion by pressing the CTRL+Z keys.

Let's perform the following steps to delete a slide:

1. *Select* the slide from the slide pane that you want to delete. In our case, we have selected **slide 2**, as shown in Fig.Impress-2.87:

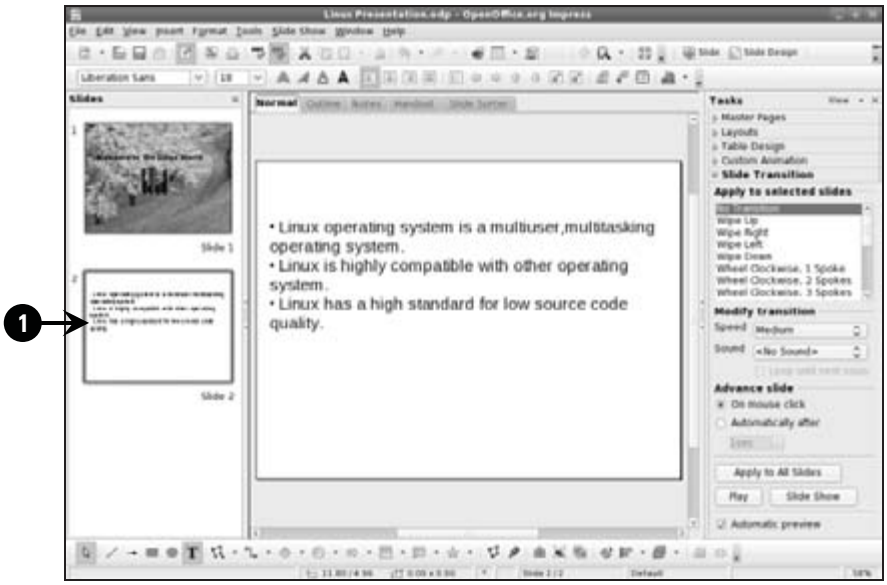


Fig.Impress-2.87

2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.88).
3. *Select* the **Delete slide** option form the drop-down menu, as shown in Fig.Impress-2.88:

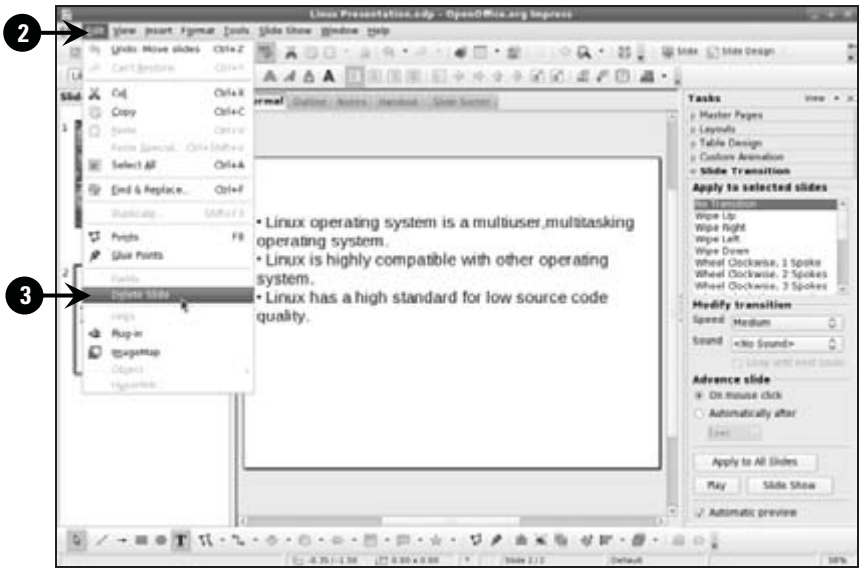


Fig.Impress-2.88

The selected slide gets deleted, as shown in Fig.Impress-2.89:



Fig.Impress-2.89

After learning about moving and deleting the slides, let's now learn to save the existing presentation.

Saving the Existing Presentation

After applying all the changes and performing all the operations in your presentation, you should save the presentation. The saving process in the Impress application is similar to saving other OpenOffice.org files.

Let's perform the following steps to save the changes made in the presentation:

1. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.90).
2. *Select* the **Save** option from the drop-down menu, as shown in Fig.Impress-2.90:

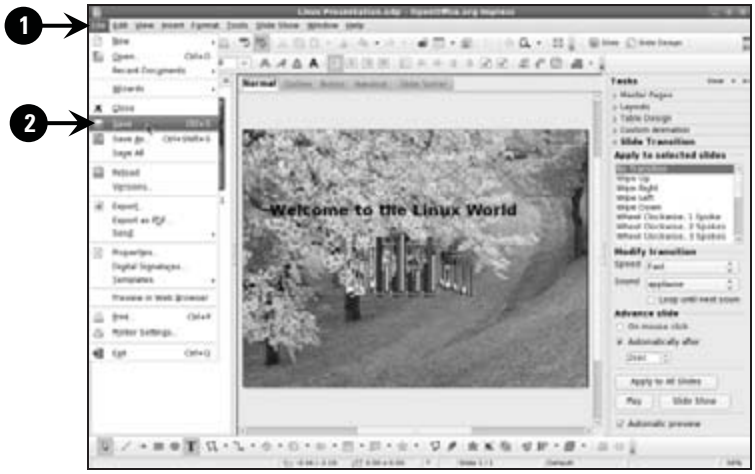


Fig.Impress-2.90

The changes are applied to the presentation.

Printing the Presentation

You can view your presentation in the print preview screen, before printing, to check whether it is correct or not. You need to set different printing settings before printing the presentation. The printer settings are divided into the following four sections.

- **Printer**: Lets you to select the printer name beside the Name list box. The printer name appears in the print dialog box.
- **Print content**: Provides the printing view, such as the Slides view and Handout view.
- **Print range**: Allows you to specify the number of pages that you want to print.
- **Copies:** Enables you to enter the number of copies that you want to print.

Let's perform the following steps to print a presentation.

1. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Impress-2.91).
2. *Select* the **Print** option from the drop-down menu, as shown in Fig.Impress-2.91:



Fig.Impress-2.91

The **Print** dialog box appears (Fig.Impress-2.92).

3. *Select* the printer from which you wish to print your presentation. In our case, we have selected the **Generic Printer** (Fig.Impress-2.92).
4. *Click* the up-down arrow of the **Content** list box under the **Print content** section. A drop-down list appears (Fig.Impress-2.93).
5. *Select* the desired print content. In our case, we have selected the **Handouts** option (Fig.Impress-2.93).



Fig.Impress-2.92

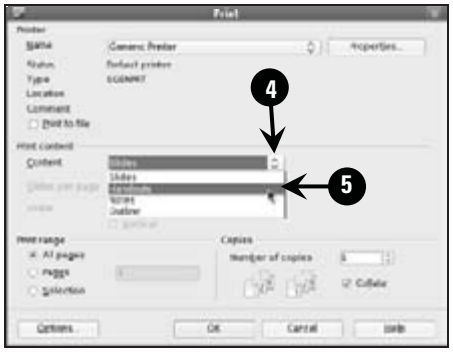


Fig.Impress-2.93

6. *Click* the up-down arrow button of the **Slide per page** list box. A list of slides pages appears (Fig.Impress-2.94).
7. *Select* the number of pages that you want to print. In our case, we have selected **1** (Fig.Impress-2.94).
8. *Select* the radio button beside the **Pages** option (Fig.Impress-2.95).

9. *Enter* the range of pages from where you wish to print the presentation. In our case, we have entered the range from 1-2 (Fig.Impress-2.95).

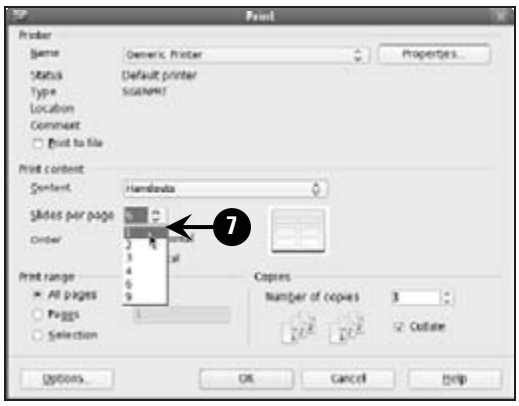


Fig.Impress-2.94

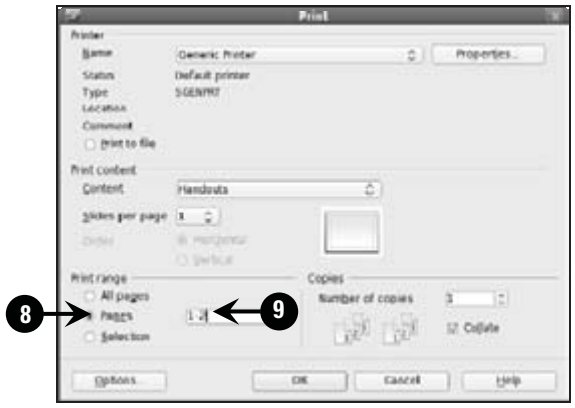


Fig.Impress-2.95

10. *Click* the up arrow button of the Number of copies list box to select the number of copies that you want to print.
11. *Click* the **OK** button, as shown in Fig.Impress-2.96:

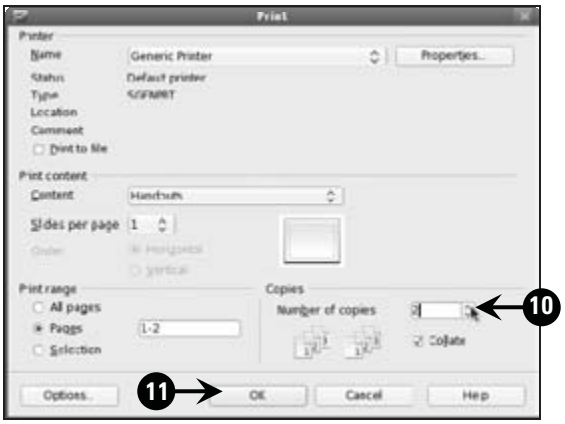


Fig.Impress-2.96

Let's now recapitulate the main points covered in this chapter.

Summary

In this chapter, you have learned to open an existing presentation. Next, you have learned to format the text, such as changing the font size and font color. Further, you have learned to apply text effects in your presentation, such as creating, editing, moving, and resizing the fontwork object. You have also learned to insert objects in a slide. Further, you have learned to run a slide show. Next, you have learned how to set options for the slide show as well as move and delete the slides. In the end, you have learned to save the existing presentation and print the presentation.

CALC

CHAPTER

1

Getting Started with OpenOffice.org Calc

In this Chapter:

- Starting OpenOffice.org Calc
- Exploring the Calc Interface
- Entering Data in a Cell
- Defining Ways to Select Cells
- Making Changes to Data
- Undoing the Last Changes
- Saving the Spreadsheet
- Closing the Spreadsheet and Quitting the OpenOffice.org Calc

OpenOffice.org Calc is an electronic spreadsheet application, similar to Microsoft Excel. A component of the OpenOffice.org suite, the OpenOffice.org Calc application is used to enter and modify data, as well as perform calculations (for example, calculating the sum, averages, or differences between values). In addition to this, you can use the OpenOffice.org Calc application to perform various tasks, such as creating a database of records or storing data in a tabular form. Data entered in the cells of the spreadsheet can be either text or numerical. OpenOffice.org Calc spreadsheets can also be opened and saved in the Microsoft Excel format, as well as convert directly in Portable Document Format (PDF). Though similar to the Microsoft Excel application, the Calc application provides certain unique features as well, such as defining series for graphic, from a given data.

A spreadsheet in the OpenOffice.org Calc application refers to a single page or sheet. It is also referred as a worksheet and a collection of worksheets constitutes a workbook. By default, there are three spreadsheets in a workbook but you can add more spreadsheets as per your requirement. You can also switch between spreadsheets by clicking the tab of the desired spreadsheet.

This chapter begins by showing you how to start the OpenOffice.org Calc application. Then the chapter proceeds to explore the OpenOffice.org Calc interface. In addition, you learn to enter data in the cells of the spreadsheet. You also learn about different methods of selecting a cell and making changes to the data in the cell. After that, you find out how to undo the changes that are not required. Toward the end of the chapter, you learn to save spreadsheet in different file formats and close it.

Let's begin with, how to start the OpenOffice.org Calc application.

Starting OpenOffice.org Calc

Let's perform the following steps to start the OpenOffice.org Calc application of the OpenOffice.org suite:

1. *Select* the **Applications** option from the top panel appearing on the Linux desktop (Fig.Calc-1.1). A drop-down list appears (Fig.Calc-1.1).
2. *Place* the mouse-pointer on the **Office** option (Fig.Calc-1.1). A submenu appears (Fig.Calc-1.1).
3. *Select* the **OpenOffice.org Calc** option from the submenu, as shown in Fig.Calc-1.1:



Fig.Calc-1.1

The OpenOffice.org Calc application window appears, as shown in Fig.Calc-1.2:

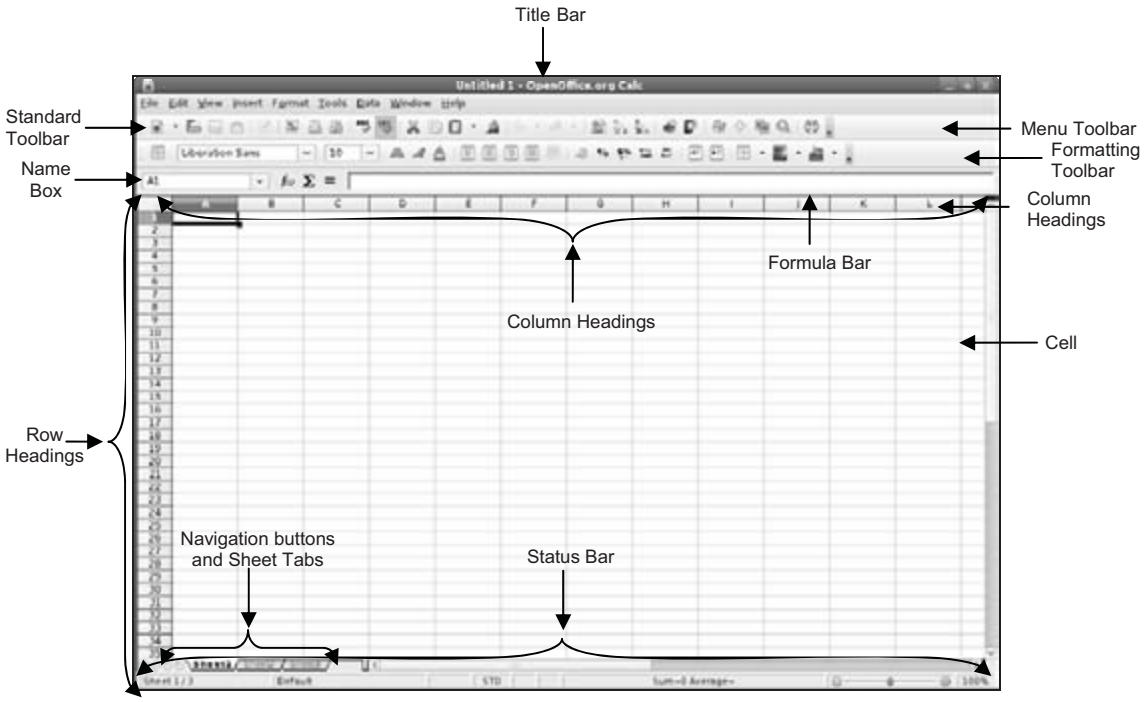


Fig.Calc-1.2

Now, let's briefly explore the interface of the OpenOffice.org Calc application.

Exploring the OpenOffice.org Calc Interface

When you start the OpenOffice.org Calc application for the first time, a blank document window appears by default. The Calc interface comprises the following components:

- **Title bar:** Displays the name of the currently opened document (Fig.Calc-1.2).
- **Menu bar:** Consists of menus, such as File, Edit, View, or Insert (Fig.Calc-1.2).
- **Standard toolbar:** Consists of tools (Fig.Calc-1.2) to perform the basic functions, such as open, save, copy, cut, or paste.
- **Formatting toolbar:** Consists of tools (Fig.Calc-1.2) for formatting the text.
- **Name Box:** Displays the address of the active cell or a range of selected cells (Fig.Calc-1.2).
- **Formula bar:** Contains the content of the selected cell or formula applied on the selected cell. (Fig.Calc-1.2).
- **Column headings:** Display the names of the columns (Fig.Calc-1.2). In the Calc application, each spreadsheet contains 1024 columns, which are represented by an alphabetic character or a collection of letters.
- **Row headings:** Display the name of the row (Fig.Calc-1.2). In the Calc application, each spreadsheet contains 65536 rows that are represented with numbers.
- **Cell:** Refers to the area of intersection of a row and a column (Fig.Calc-1.2).
- **Navigation buttons and Sheet tabs:** Allow you to navigate (Fig.Calc-1.2) from one spreadsheet to another in a workbook. Sheet tabs display names of worksheet present in a workbook. You can change the default name of worksheet by double-clicking the tab and typing your desired name. Sheet tabs are also alternate to navigation buttons.
- **Status bar:** Displays information about the current spreadsheet (Fig.Calc-1.2).

Now that you are familiar with the basic components of the CalcOpenOffice.org Calc interface, let's learn to enter data in a OpenOffice.org Calc spreadsheet.

Entering Data in a Cell

You usually begin working in a spreadsheet by entering some data in its cells. Any data you enter in a OpenOffice.org Calc spreadsheet is in the form of a number, formula, special character, or text. The data you enter is considered either as a label or a value by the application.

A label is any text entry that contains alphabet or non-numeric characters, such as #, &, or *. Examples of labels are Accounts, #4, or Monthly-expenses. On the other hand, a value represents a number, on which calculations are done, using formulas. Whenever an entry starts with the +, -, or . signs, the OpenOffice.org Calc application considers that entry as a value. Entries containing an alphabet or a character, even if they start with a number, are called text entries. For example, 24 Downrange lane and 4th are text entries.

Let's begin with learning to enter text.

Entering a Label (Text)

Perform the following steps to enter data in a cell of the spreadsheet:

1. *Open* the **OpenOffice.org Calc** application. A blank document appears (Fig.Calc-1.2).
2. *Select* the cell in which you want to insert data. The selected cell becomes active (Fig.Calc-1.2).
3. *Double-click* the active cell. A cursor appears, as shown in Fig.Calc-1.3:

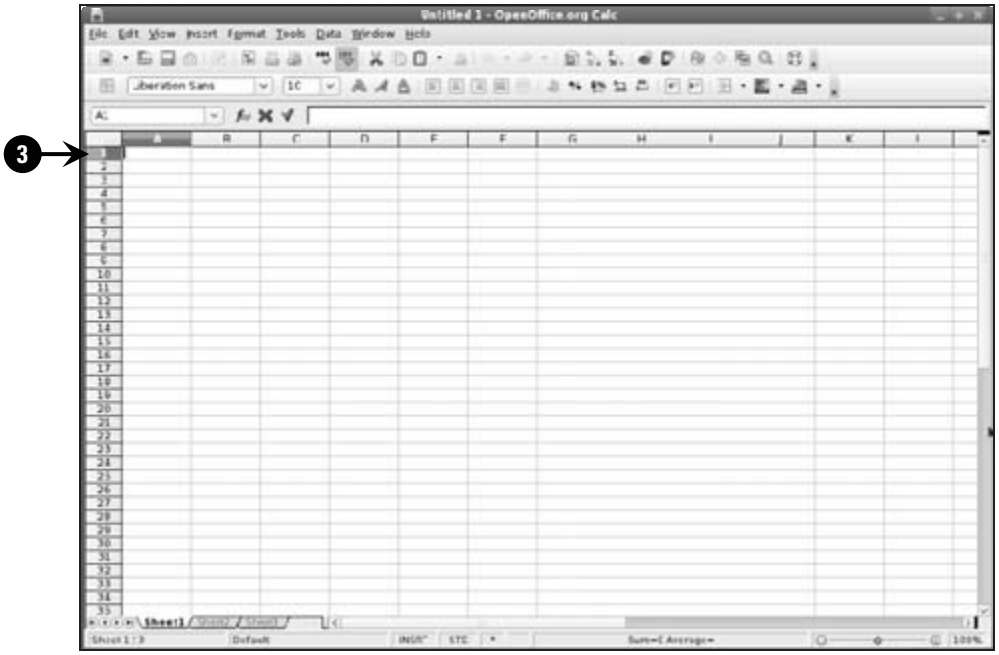


Fig.Calc-1.3

4. Type the text that you want to enter in the active cell. In our case, we have typed Subjects in the cell, as shown in Fig.Calc-1.4:

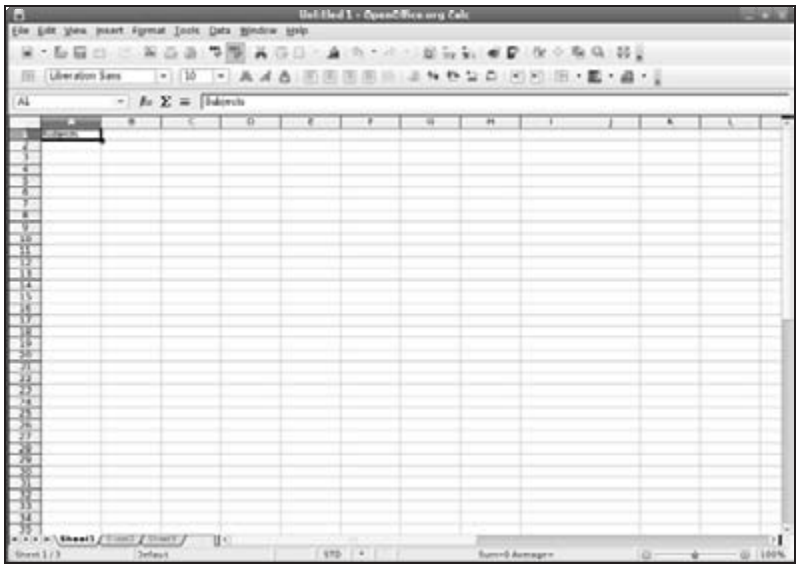


Fig.Calc-1.4

The text appears in the selected cell (Fig.Calc-1.4).

Let's now learn to enter a value in a cell.

Entering a Value/ Number

You can also add numerical values in your spreadsheets. Perform the following steps to insert a value or a number in a cell:

1. *Select* the cell in which you want to insert data. The selected cell becomes active, as shown in Fig.Calc-1.5:

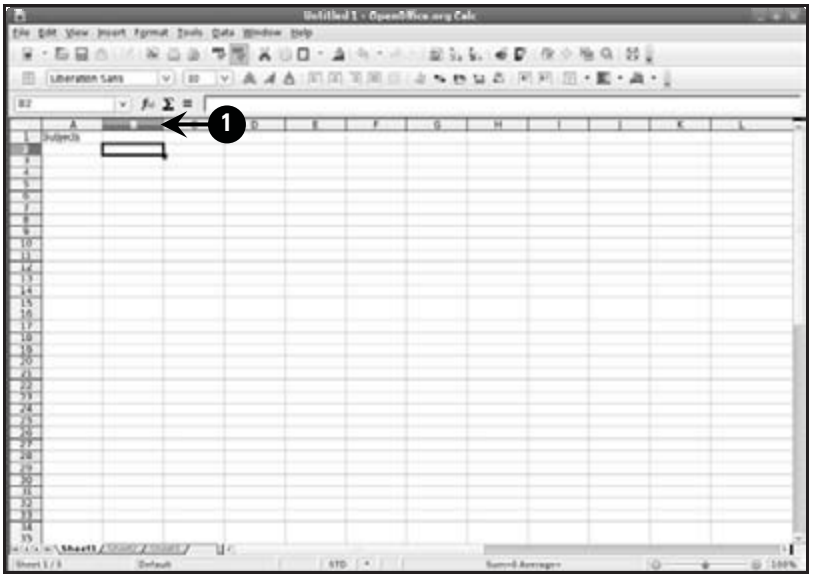


Fig.Calc-1.5

2. *Double-click* the active cell. A cursor appears, as shown in Fig.Calc-1.6:

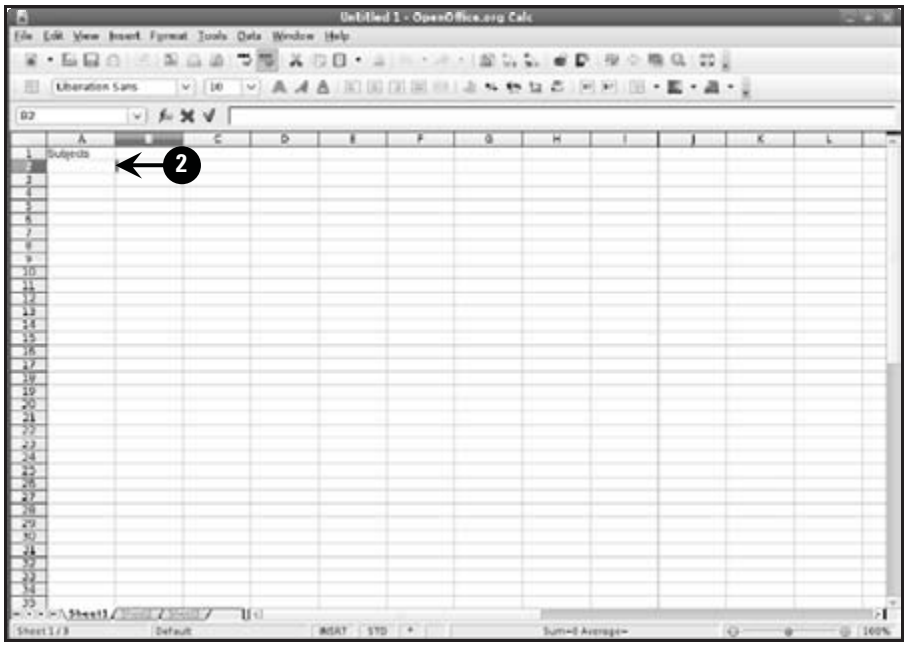


Fig.Calc-1.6

3. *Type* the value that you want to enter in the active cell. In our case, we have typed **89** in the cell, as shown in Fig.Calc-1.7:

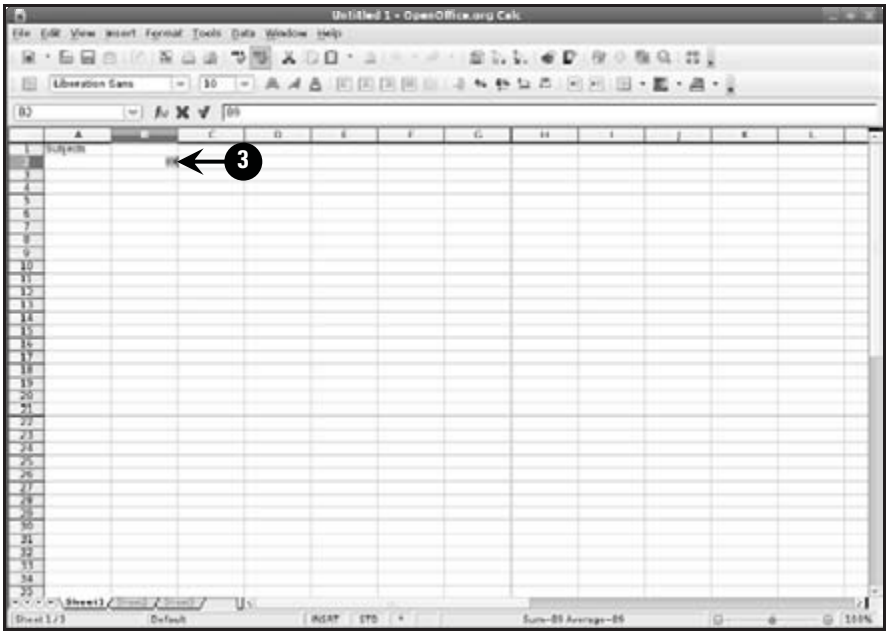


Fig.Calc-1.7

The value appears in the selected cell (Fig.Calc-1.7).

Now, let's learn the different ways to select existing data in a cell of the spreadsheet.

Defining Ways to Select Cells

When we talk about selecting cells either directly by clicking the desired cells or indirectly by using the Menu bar, we mean selecting a number, text, or an alphanumeric value present in the cell. In the OpenOffice.org Calc application, you can select a cell from the document window, Edit menu, and Name box. After selecting a row, column, or cell in a spreadsheet, you can delete the content of the selected cell or cell range, copy and paste the selection, or drag the selection to either within the spreadsheet or to another spreadsheet. The selected cells appear outlined in the spreadsheet. You can select a single cell by merely clicking it. However, for multiple cell selection, you need to press the mouse-button and drag it until the required cells are outlined. There are two methods to select cells, known as continuous and non-continuous. Let's briefly discuss these methods in the following sections.

Exploring Continuous Selection

Continuous selection refers to a selection of cells within a row, column, or the combination of both row and column, without leaving a single cell. An example of continuous selection of cell A2:B5 is shown in Fig.Calc-1.8:

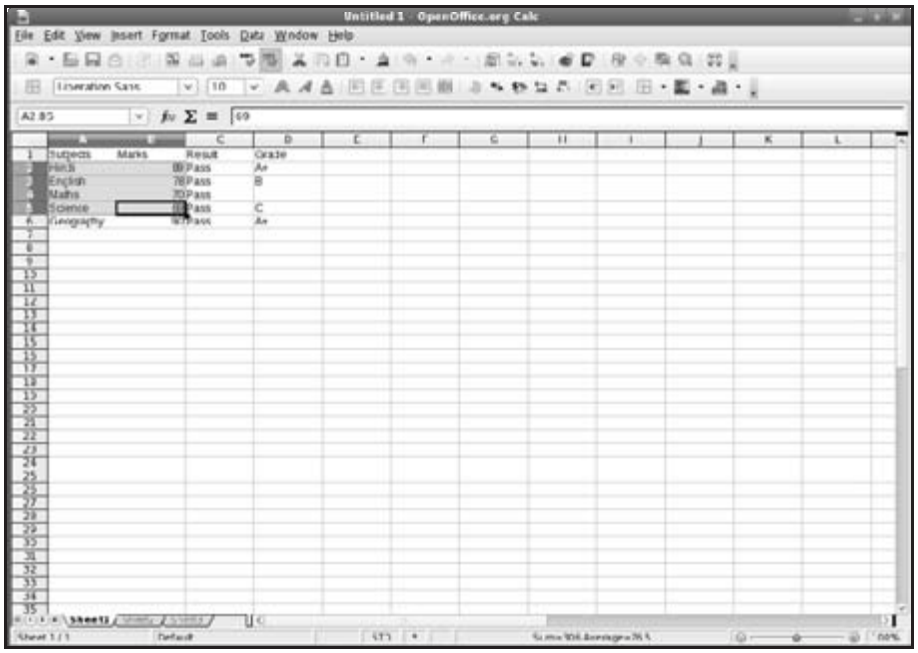


Fig.Calc-1.8

Next, let's discuss non-continuous selection.

Exploring Non-Continuous Selection

Non-continuous selection refers to the random selection of data present in the spreadsheet cells. While making a non-continuous selection, you have to either select random cells vertically within a column or horizontally across different columns within a single common row. You cannot select cells randomly across different columns. Therefore, for non-continuous selection, you have to restrict the selection within the limits of a single column or a common row stretching across different columns. An example of non-continuous selection is shown in Fig.Calc-1.9:

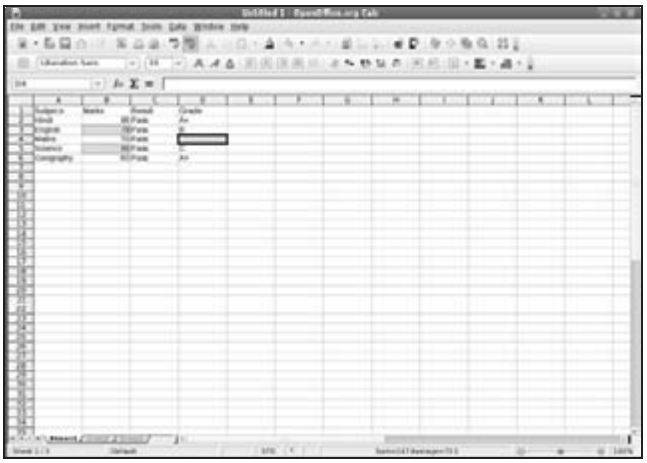


Fig.Calc-1.9

Let's now learn to modify data present in a cell.

Making Changes to Data

You cannot perform any calculations or other operations, such as cut or copy, without selecting cells. For example, if you want to find the sum of the values appearing in particular cells, you have to select the cells first. For example, if you want to find sum of cells ranging between B2 to B6 then first of all select cells from B2 to B6. The sum of selected cells appears on the Title bar.

You can also delete, replace, cut, copy, or paste data after selecting the required cells. In the following sections, you learn to delete and replace data in the cells of a spreadsheet.

Deleting the Data

Sometimes, you may find that the data you entered in a spreadsheet is not required. In such cases, you can delete the data as and when needed.

Perform the following steps to delete the data in a cell:

1. *Double-click* the cell in which you have to delete the data. A cursor appears (Fig.Calc-1.10).
2. *Place* the cursor before the character you want to delete, as shown in Fig.Calc-1.10:

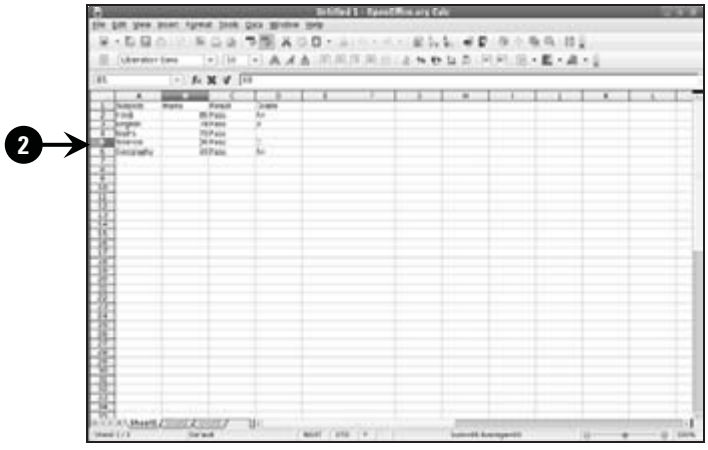


Fig.Calc-1.10

3. *Press* the **DELETE** key.

The character is deleted, as shown in Fig.Calc-1.11:

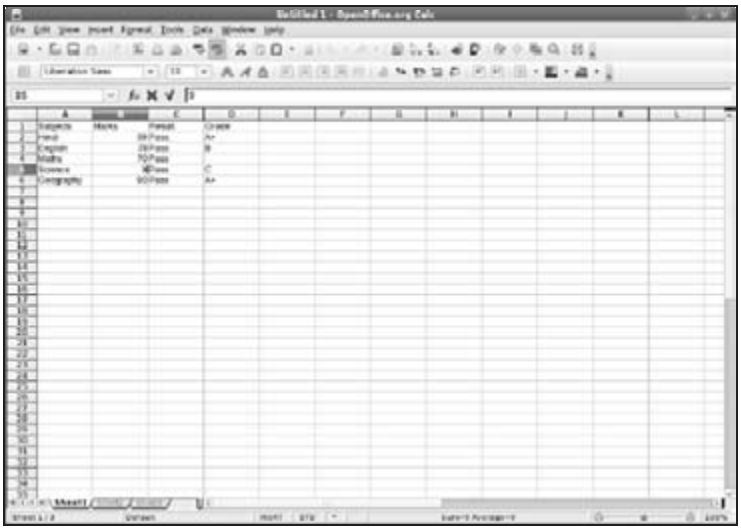


Fig.Calc-1.11

Now, let's learn to replace the data of a cell.

Replacing the Data

Working with data may require replacing the existing data with some other data. You can replace either a part of the existing data or complete data as per your requirement.

Perform the following steps to replace the existing data in a cell in spreadsheet:

1. *Select* the cell whose data you want to replace (Fig.Calc-1.12).
2. *Double-click* the selected cell. A cursor appears in the cell, as shown in Fig.Calc-1.12:

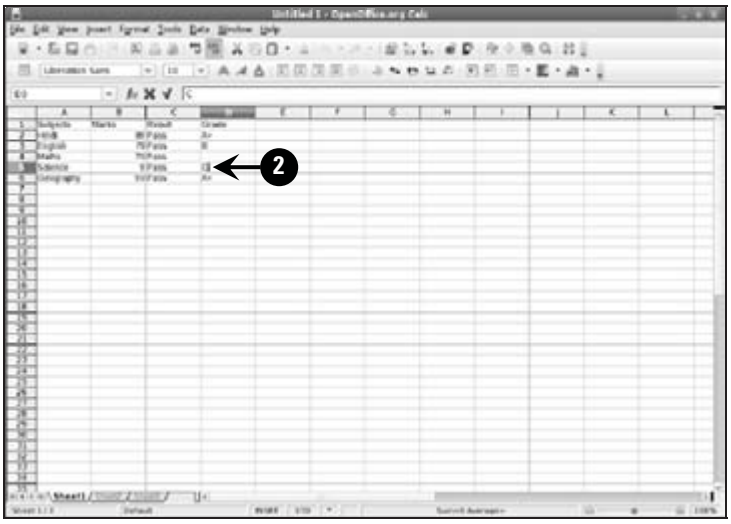


Fig.Calc-1.12

3. *Select* the data that you want to replace, as shown in Fig.Calc-1.13:

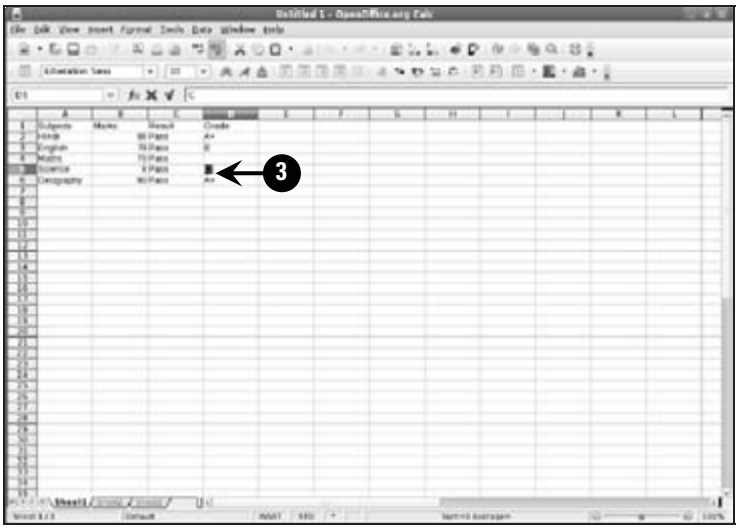


Fig.Calc-1.13

4. *Type* the new data. In our case, we have replaced the character C with F, as shown in Fig.Calc-1.14:

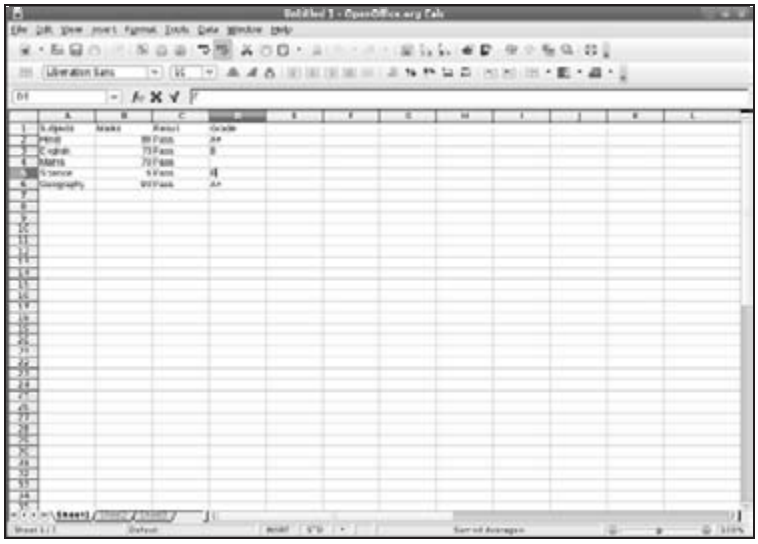


Fig.Calc-1.14

The new data appears in the selected cell (Fig.Calc-1.14).

Let's now learn to undo the changes.

Undoing the Last Changes

OpenOffice.org Calc provides Undo command which reverses the last changes carried by in the workbook. For example, by mistake you delete a value from the cell then you can bring back the value by selecting the Undo command. You can find Undo command under the Edit menu.

Perform the following steps to undo the changes in spreadsheet:

1. *Click* the **Edit** menu from the Menu bar. A drop-down list appears (Fig.Calc-1.15).
2. *Select* the **Undo: Input** option from the Menu bar, as shown in Fig.Calc-1.15:

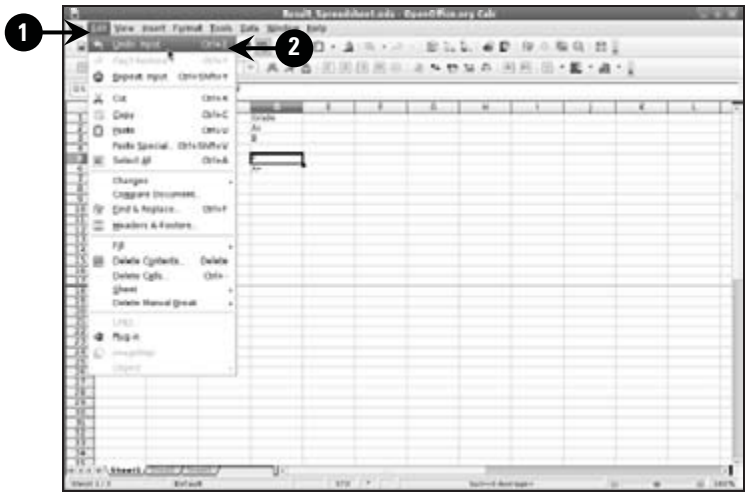


Fig.Calc-1.15

The change made in the preceding section is cancelled, as shown in Fig.Calc-1.16:

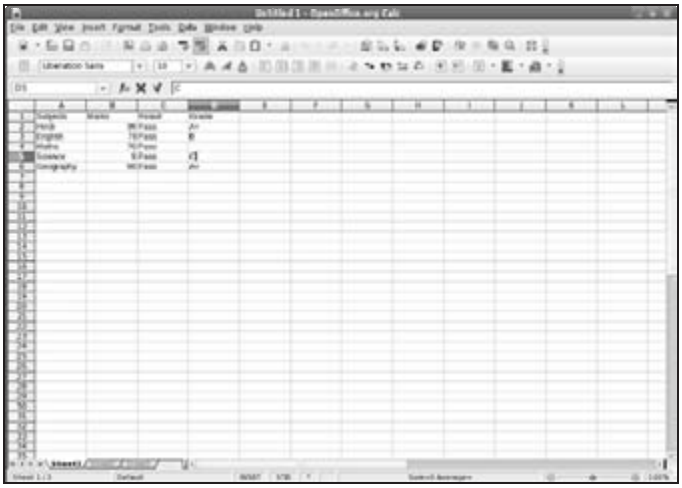


Fig.Calc-1.16

Now, let's learn how to save the spreadsheet.

Saving the Spreadsheet

After creating a spreadsheet, you should save it so that you can open, view, and modify it whenever required. Saving the spreadsheet allows you to give it a unique name to distinguish it from other spreadsheets. If it is not saved, the data is lost after the spreadsheet is closed. When a spreadsheet is saved for the first time or saved with an alternate name at some other location on the computer, the Save dialog box appears prompting you to specify and destination to save the workbook.

Perform the following steps to save the spreadsheet created in the preceding section:

1. *Click* the **File** menu from the Menu bar. A drop-down list appears (Fig.Calc-1.17).
2. *Select* the **Save** option from the **File** menu, as shown in Fig.Calc-1.17:

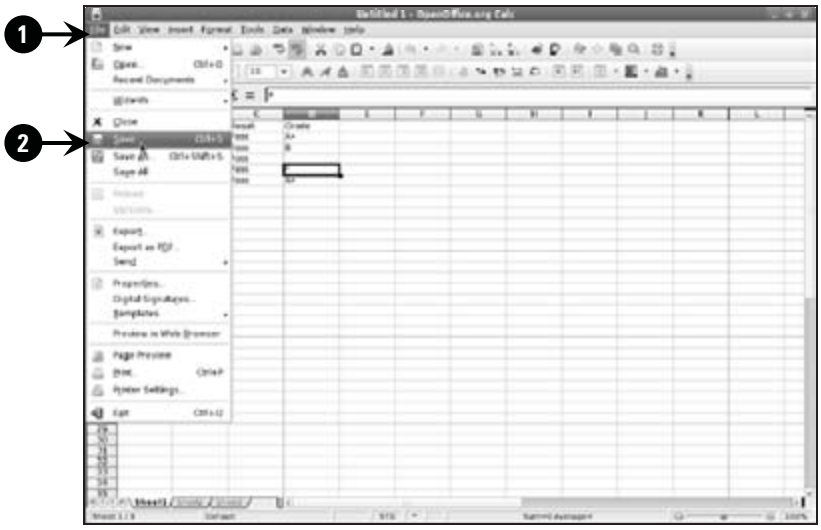


Fig.Calc-1.17

The **Save** dialog box appears (Fig.Calc-1.18).

3. *Type* the filename with which you want to save the spreadsheet, in the **Name** text box. In our case, we have typed **Result_Spreadsheet** (Fig.Calc-1.18).
4. *Browse* to the location where you want to save your file from the **Places** pane. In our case we have selected Desktop (Fig.Calc-1.18).
5. *Click* the **Save** button, as shown in Fig.Calc-1.18:

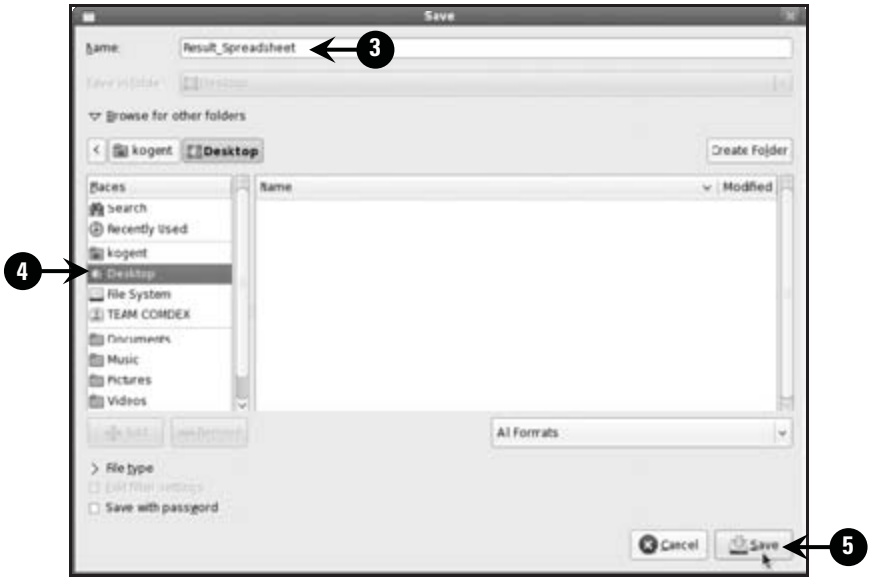


Fig.Calc-1.18

The file is saved with the specified name. The name of the file that is **Result_Spreadsheet.ods,** can be seen in the title bar, as shown in Fig.Calc-1.19:

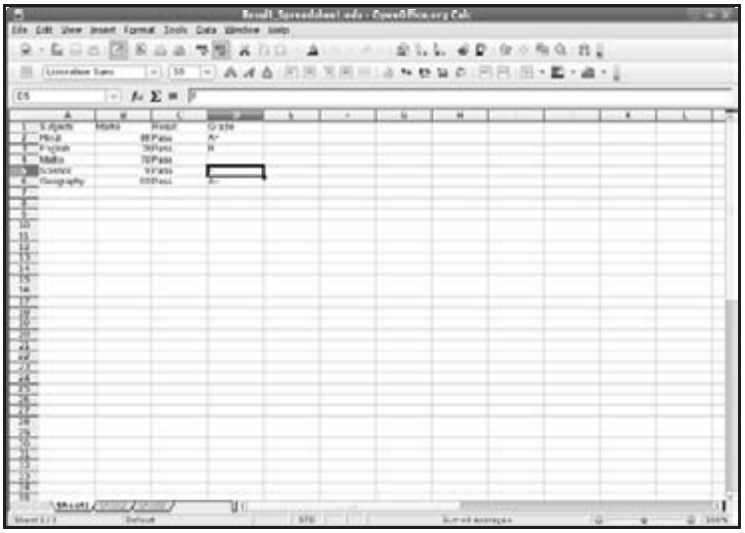


Fig.Calc-1.19

Most of the users opt for a multi-operating system environment these days. So it has become quite important that the document created in one environment can be easily accessed in another. You can also save a spreadsheet created in OpenOffice.org Calc in the windows compatible format so that they could be easily accessed in a Windows system.

Perform the following steps to save the spreadsheet in the Windows compatible format:

1. *Click* the **File** menu from the Menu bar. A drop-down list appears (Fig.Calc-1.20).
2. *Select* the Save As option from the **File** menu, as shown in Fig.Calc-1.20:

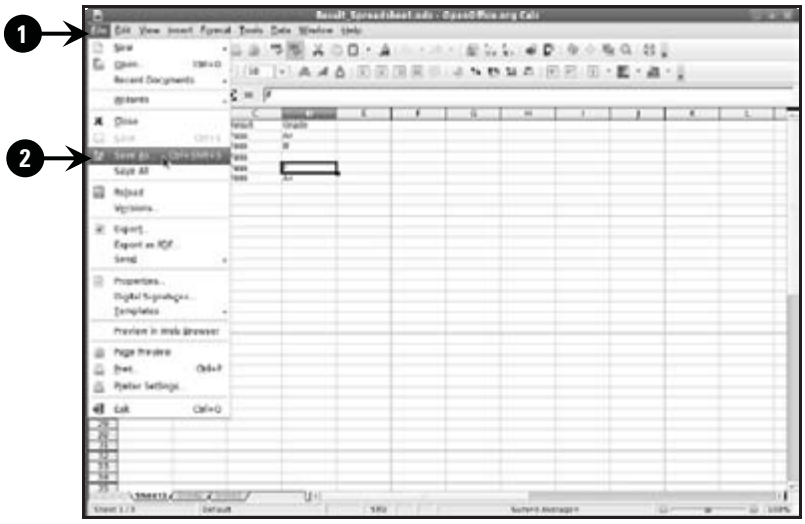


Fig.Calc-1.20

The **Save** dialog box appears (Fig.Calc-1.21).

3. *Click* the arrow besides the **File type** option, as shown in Fig.Calc-1.21:



Fig.Calc-1.21

A list of file formats appears (Fig.Calc-1.22).

4. *Drag* the scroll bar (Fig.Calc-1.22).
5. *Select* the required file format. In our case, we have selected, **Microsoft Excel 97/2000/XP** (Fig.Calc-1.22).
6. *Click* the **Save** button, as shown in Fig.Calc-1.22:

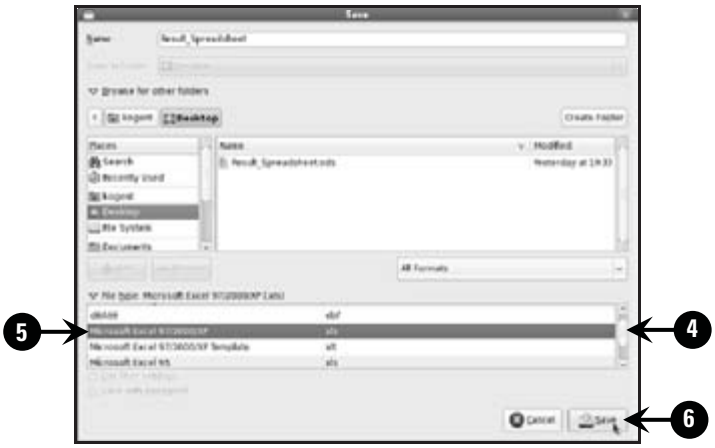


Fig.Calc-1.22

The **OpenOffice.org 3.1** dialog box appears (Fig.Calc-1.23).

7. *Click* the **Keep Current Format** button, as shown in Fig.Calc-1.23:

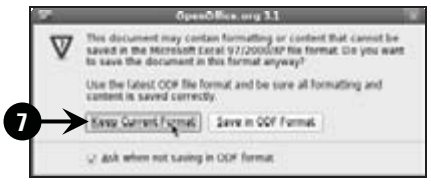


Fig.Calc-1.23

The spreadsheet is saved with the extension .xls, which is the Microsoft Office Excel compatible format. This extension can be seen in the Title bar, as shown in Fig.Calc-1.24:

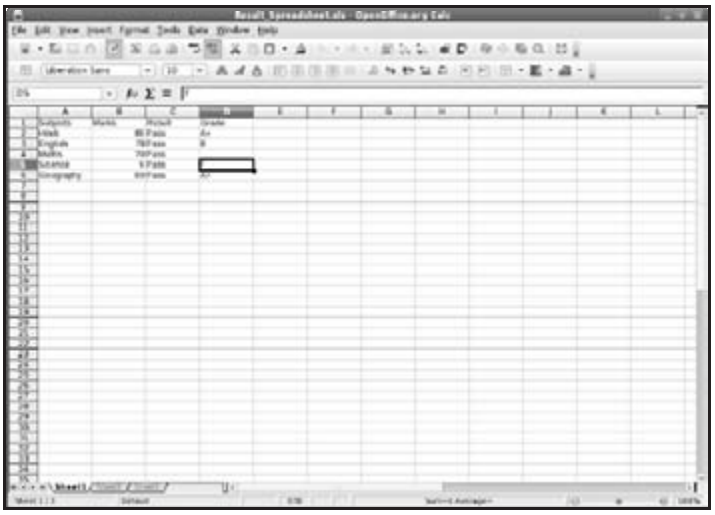


Fig.Calc-1.24

After saving the spreadsheet, it's time to close it.

Closing the Spreadsheet and Quitting the OpenOffice.org Calc

Till now, you learned how to create a spreadsheet in the OpenOffice.org Calc application. You also worked on the created spreadsheet. After completing your work and saving the spreadsheet, you can close OpenOffice.org Calc application. Before closing the application, make sure you save the changes carried out in the workbook.

Perform the following steps to close a spreadsheet:

1. *Click* the **File** menu from the menu bar (Fig.Calc-1.25). A drop-down list appears (Fig.Calc-1.25).
2. *Select* the **Close** option from the **File** menu, as shown in Fig.Calc-1.25:

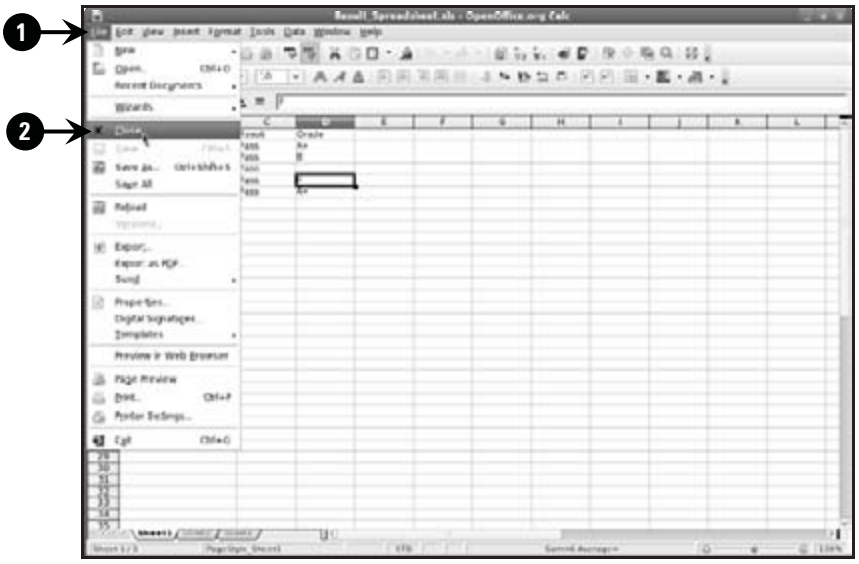


Fig.Calc-1.25

The workbook is closed, as shown in Fig.Calc-1.26:



Fig.Calc-1.26

Closing the spreadsheet is not enough to quit the OpenOffice.org Calc application. Perform the further steps to quit the OpenOffice.org Calc:

1. *Click* the **File** menu from the menu bar (Fig.Calc-1.27). A drop-down list appears (Fig.Calc-1.27).
2. *Select* the **Exit** option from the **File** menu, as shown in Fig.Calc-1.27:



Fig.Calc-1.27

The OpenOffice.org Calc application window is closed. Now, let's summarize the main points of this chapter.

Summary

In this chapter, you have learned to start the OpenOffice.org Calc application and explored various components of the OpenOffice.org Calc interface. It has shown you how to enter data, either text or a value, in a cell of the Calc spreadsheet. You also found out about the different cell selection methods. In addition, you have learned to modify data in the spreadsheet by deleting or replacing the data. You get acquainted with the method of undoing changes. In the end, you have learned to save the spreadsheet in different formats and close it.

CHAPTER

2

Working with Functions and Operators

In this Chapter:

- Using a Cell Range
- Working with the Date() and Time() Functions
- Exploring the Logical Functions
- Working with the Mathematical Functions
- Working with the Text Functions
- Working with the Spreadsheet Functions
- Applying a Function Automatically to Other Cells
- Working with Operators
- Introducing Relative Cell Addressing
- Introducing Absolute Cell Addressing

In OpenOffice.org Calc, you can perform calculations on values present in a spreadsheet using functions and operators.

OpenOffice.org Calc performs many functions to process numbers, date and time, or even text. A function may be as simple as adding two numbers together or finding the average of a list of numbers. On the other hand, it may be as complex as calculating the standard deviation of a sample or a hyperbolic tangent of a number. The arguments, contained in the round brackets, are used to specify the parameters of the function. For instance, the **Sum(2,8)** function returns the sum of numbers 2 and 8 as the output, which is 10.

Operators refer to symbols that are used to define the relationship between different values. For instance, in the **A1+B1** expression, the **plus** (+) operator is used to add the values contained in the A1 and B1 cells.

In this chapter, you learn about the cell range and its usage. You also learn about the commonly used functions and operators of OpenOffice.org Calc. In addition, you learn how to use the operators to perform various types of calculations. Toward the end of chapter, you get familiar with the relative and absolute cell addressing.

Let's start with defining a cell range.

Using a Cell Range

You can perform calculation on more than two values by providing cell range to a function. A cell range is a sequence of contiguous cell addresses. The syntax to define a cell range is as follows:

```
Address of the first cell: Address of the last cell
```

For example, the expression C1:C6 refers to cells from C1 through C6.

Working with the Date() and Time() Functions

The Date () and Time () functions are generally used to specify date and time of the system. Once entered, you can change the values of date and time to display them in the number format where the mathematical functions can be applied to them. For example, 01/01/2000 12:00 PM, when converted to the number format, gives 36526.5 as output. The value preceding the decimal point is date and the value after the decimal point is the number representation of time. Some of the commonly used functions to show date and time are as follows:

- Date()
- Now()
- Time()

Let's now discuss each of these functions in detail.

Using the Date() Function

The Date() function returns the date. The value return by the Date() function is internal date number (date number provided by the system) and appear as serial number. To convert serial or internal number into desirable date format, we need to convert the format of the cell from number to text.for a given date. The following is the syntax for the Date () function:

```
DATE (year; month; day)
```

In the preceding syntax:

- **year:** Refers to an integer indicating the year
- **month:** Refers to an integer indicating the month
- **day:** Refers to an integer indicating the day of the month

Perform the following steps to find the date number for a given date:

1. *Open* the existing spreadsheet to perform the Date () function. In our case, we have opened the **Sample_file.ods** spreadsheet (Fig.Calc-2.1).
2. *Click* the function wizard button on the Formula bar, as shown in Fig.Calc-2.1:

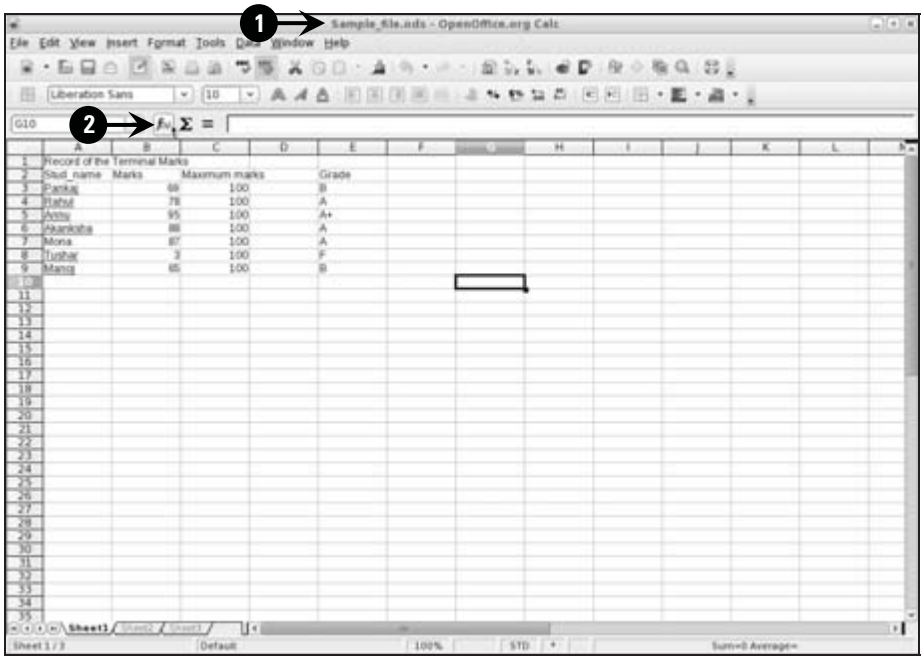


Fig.Calc-2.1

The Function Wizard appears (Fig.Calc-2.2).

3. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.2). A drop-down list appears.
4. *Select* the required category of function. In our case, we have selected the **Date&Time** category (Fig.Calc-2.2).

   The Date&Time category is displayed in the Category list box (Fig.Calc-2.3).
5. *Select* the required function from the **Function** list box. In our case, we have selected the **DATE** function (Fig.Calc-2.3).
6. *Click* the **Next** button (Fig.Calc-2.3).



Fig.Calc-2.2

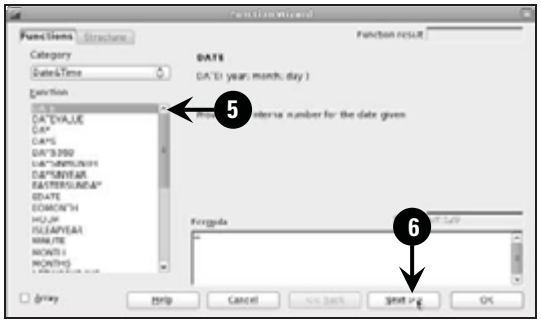


Fig.Calc-2.3

7. *Enter* a value for the year in the **year** text box. In our case, we have entered 1998 (Fig.Calc-2.4).
8. *Enter* a value for the month in the **month** text box. In our case, we have entered 05 (Fig.Calc-2.4).
9. *Enter* a value for the day in the **day** text box. In our case, we have entered 21 (Fig.Calc-2.4).
10. *Click* the **OK** button, as shown in Fig.Calc-2.4:

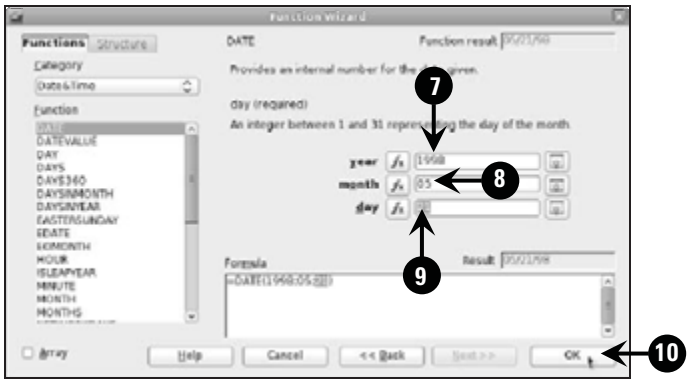


Fig.Calc-2.4

The serial number, **35936**, representing the date 05/21/98 appears in the cell. The serial number will not appear in desired date format unless we change the format of cell to text (Fig.Calc-2.5).

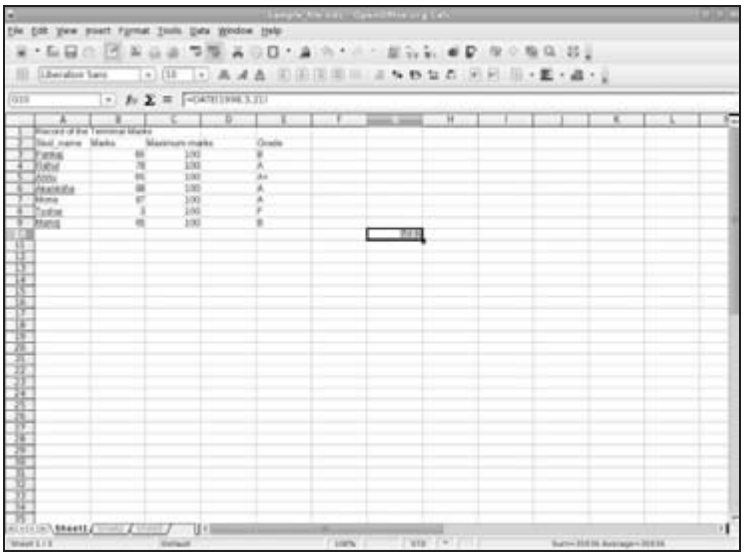


Fig.Calc-2.5

The number **35936** is also called the internal number of the date.

Let's learn how to use the Now function.

Using the Now() Function

The Now() function returns the current date and time of your computer. This function does not include any parameter. The following is the syntax for the Now() function:

```
NOW()
```

Perform the following steps to find the date and time of a computer:

1. *Click* the function wizard button on the Formula bar. The Function Wizard dialog box appears (Fig.Calc-2.2).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.2).
3. *Select* the required category of function (Fig.Calc-2.2). In our case, we have selected the **Date&Time** category. The Date&Time category is displayed in the **Category** list box (Fig.Calc-2.6).

4. *Select* the required function from the **Function** list box. In our case, we have double-clicked the **NOW** function (Fig.Calc-2.6).
5. *Click* the **OK** button, as shown in Fig.Calc-2.6:



Fig.Calc-2.6

The current date and time of the computer appears in the selected cell, as shown in Fig.Calc-2.7:

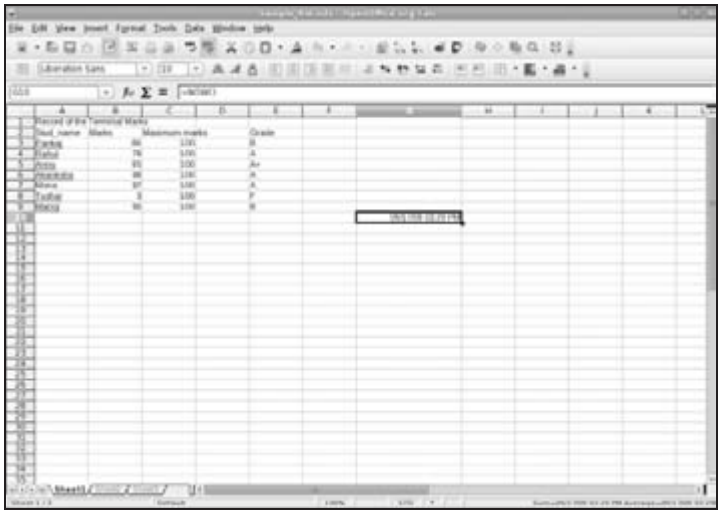


Fig.Calc-2.7

Let's now learn how to use the Time () function.

Using the Time() Function

The Time() function returns the current time value from the values of hours, minutes, and seconds. The following is the syntax for the Time() function:

```
TIME (Hour; Minute; Second)
```

Perform the following steps to find the customized time of the computer:

1. *Click* the function wizard button on the Formula bar. The Function Wizard dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.2).
3. *Select* the required category of function. In our case, we have selected the **Date&Time** category. The Date&Time category is displayed in the **Category** list box (Fig.Calc-2.8).

4. *Select* the required function from the **Function** list box. In our case, we have selected the **TIME** function (Fig.Calc-2.8).
5. *Click* the **Next** button (Fig.Calc-2.8).
6. *Enter* a value for the hour in the **hour** text box. In our case, we have entered 14 (Fig.Calc-2.9).
7. *Enter* a value for the minute in the **minute** text box. In our case, we have entered 25 (Fig.Calc-2.9).
8. *Enter* a value for the second in the **second** text box. In our case, we have entered 30 (Fig.Calc-2.9).
9. *Click* the **OK** button (Fig.Calc-2.9).

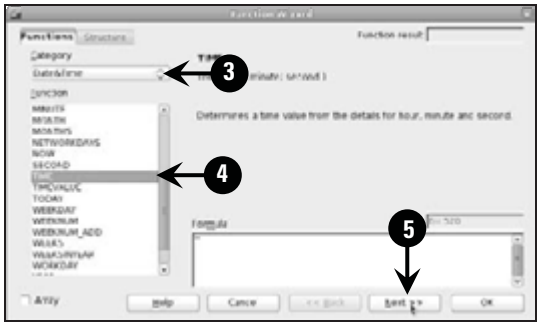


Fig.Calc-2.8

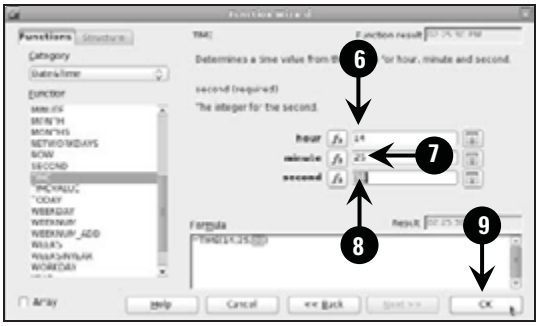


Fig.Calc-2.9

The time value appears in the selected cell, as shown in Fig.Calc-2.10:

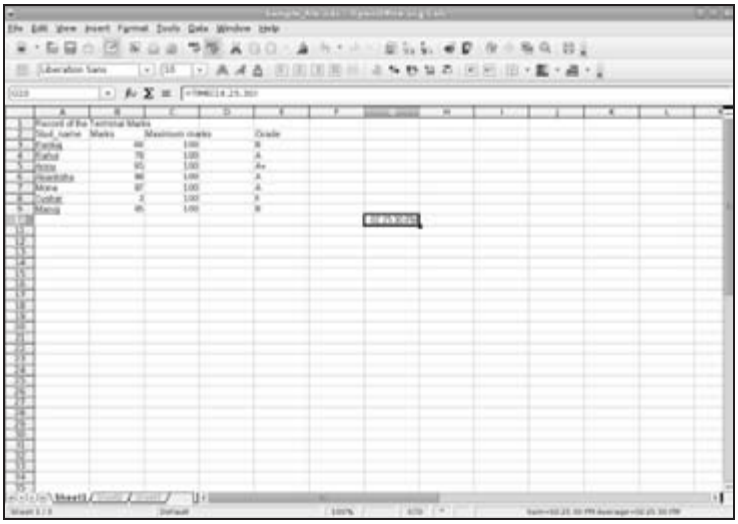


Fig.Calc-2.10

After learning how to display date and time of a computer, let's proceed to learn about the logical functions.

Exploring the Logical Functions

The logical functions are used to test values and produce results based on these values. In OpenOffice.org Calc, logical functions return boolean values 0 and 1, where 0 represents False and 1 represents True. In this section, you learn about various logical functions, such as AND, FALSE, and IF.

Table 2.1 lists the syntaxes of logical functions with their descriptions:

Table 2.1: Syntaxes of Logical Functions	
Syntax	**Description**
AND(LogicalValue1; LogicalValue2; ...LogicalValue30)	Returns TRUE only if all the arguments passed as a parameter to the function are TRUE. If any element is FALSE, this function returns the FALSE value. **Logical_value_1; logical_value_2; ...logical_value_30** are conditions to be chescked. All conditions can be either TRUE or FALSE. If a range is entered as a parameter, the function uses the value from the range that is in the current column or row.
FALSE ()	Sets the logical value to FALSE. The FALSE() function does not require any arguments.
IF(test;then_value; otherwise_value)	Lets you to perform a logical test. The test value can be either TRUE or FALSE.
NOT (Logical Value)	Reverses the logical value.
OR(LogicalValue1; LogicalValue2 ...LogicalValue30)	Returns TRUE if at least one of the argument is TRUE.
TRUE ()	Sets the logical value to TRUE. The TRUE function does not require any arguments.

Let's now learn how to use the Mathematical functions.

Working with the Mathematical Functions

The mathematical functions are the algebraic formulas that are stored in OpenOffice.org Calc. These functions are used to perform different mathematical calculations. Some of the basic functions used in OpenOffice.org Calc are as follows:

- **SUM():** Adds the values of the selected range of cells
- **COUNTBLANK():** Counts the number of empty cells in a specified range of cells
- **ABS():** Returns the absolute value

Now, let's discuss these functions in detail.

The SUM() Function

The SUM() function is one of the most basic functions used in OpenOffice.org Calc. It is used to add the content of various cells and the result is displayed in the active cell containing the formula.

The following is the syntax for the SUM() function:

```
SUM (Number1, Number2, ..., Number30)
```

In the preceding syntax:

number1, number2,.....number30 are the arguments to be added.

Perform the following steps to calculate the sum of given numbers:

1. *Click* the function wizard button on the Formula bar. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.11).
3. *Select* the required category of function. In our case, we have selected the **Mathematical** category (Fig.Calc-2.11).

   The Mathematical category is displayed in the **Category** list box (Fig.Calc-2.12).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **SUM** function (Fig.Calc-2.12).
5. *Click* the **Next** button (Fig.Calc-2.12).

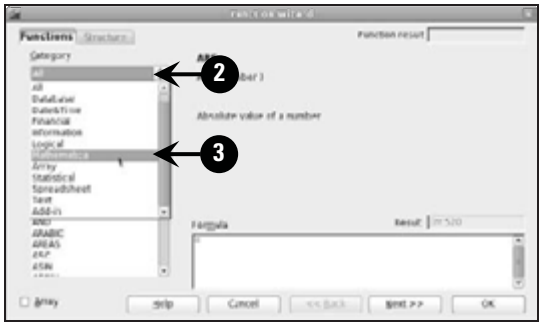


Fig.Calc-2.11

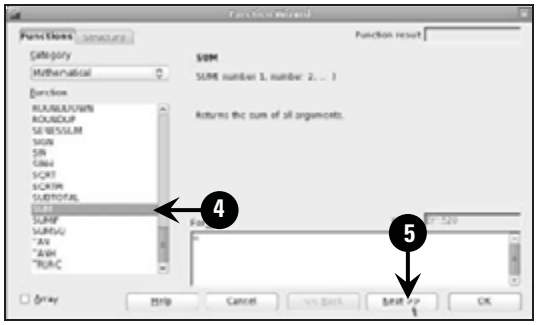


Fig.Calc-2.12

6. *Enter* the first number in the **number 1** text box. In our case, we have entered 10 (Fig.Calc-2.13).
7. *Enter* the second number in the **number 2** text box. In our case, we have entered 23 (Fig.Calc-2.13).
8. *Enter* the third number in the **number 3** text box. In our case, we have entered 73 (Fig.Calc-2.13).
9. *Enter* the fourth number in the **number 4** text box. In our case, we have entered 37 (Fig.Calc-2.13).
10. *Click* the **OK** button, as shown in Fig.Calc-2.13:

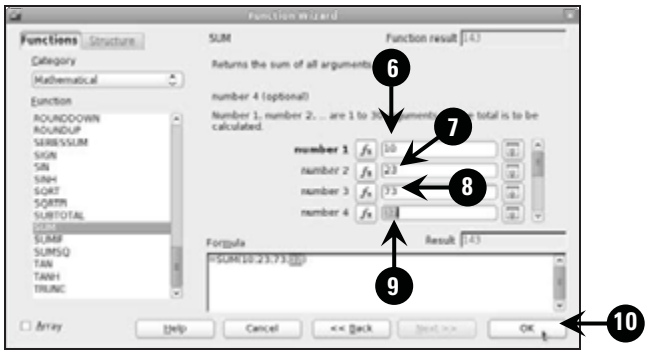


Fig.Calc-2.13

The sum of numbers appears in the selected cell, as shown in Fig.Calc-2.14:

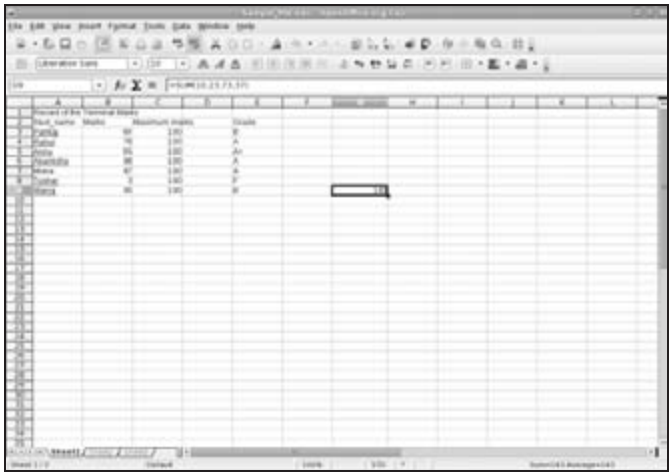


Fig.Calc-2.14

Let's now learn how to use the COUNTBLANK () function.

The COUNTBLANK() Function

The COUNTBLANK() function is used to count the number of empty cells that contains null values in a range or group of cells. The following is the syntax for the COUNTBLANK() function:

```
COUNTBLANK(Range)
```

In the preceding syntax, **Range** specifies the group of selected cells.

Perform the following steps to find the number of empty cells:

1. *Click* the function wizard button on the Formula bar. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.11).
3. *Select* the required category of function. In our case, we have selected the **Mathematical** category (Fig.Calc-2.11). The **Mathematical** category appears in the **Category** list box (Fig.Calc-2.15).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **COUNTBLANK** function (Fig.Calc-2.15).
5. *Click* the **Next** button (Fig.Calc-2.15).
6. *Enter* the range of cells in which you want to find total number of cells containing null values. In our case, we have entered the range **B3:B10** (Fig.Calc-2.16).
7. *Click* the **OK** button (Fig.Calc-2.16).



Fig.Calc-2.15

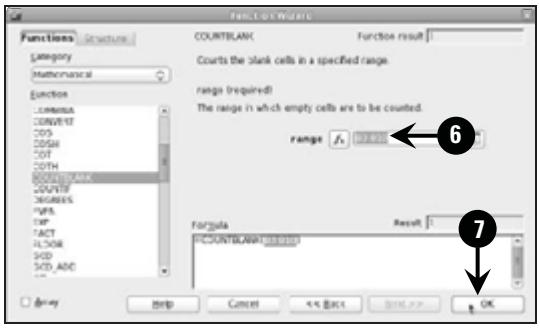


Fig.Calc-2.16

The number of cell containing null value appears, as shown in Fig.Calc-2.17:

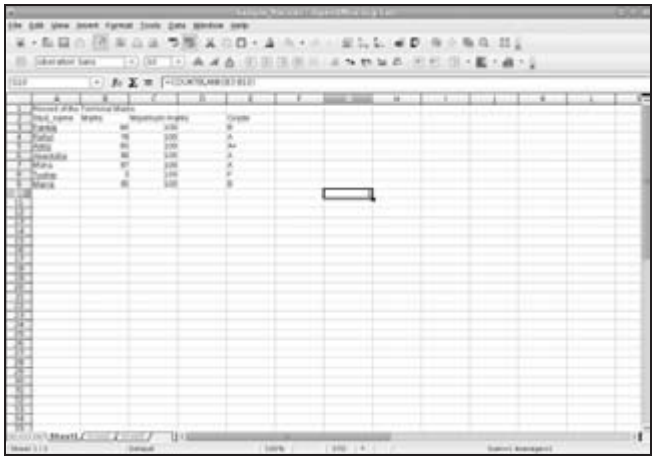


Fig.Calc-2.17

Let's now learn about the ABS() function.

The ABS() Function

The ABS() function returns the absolute value of a number. The absolute value of a number refers to its value without the +/- sign. The following is the syntax of the ABS() function:

```
ABS(Number)
```

In the preceding syntax, **Number** refers to the numeral whose absolute value is to be calculated.

Perform the following steps to find absolute value of a number:

1. *Click* the function wizard button on the **Formula bar**. A Function Wizard dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.11).
3. *Select* the required category of function. In our case, we have selected the **Mathematical** category (Fig.Calc-2.11). The Mathematical category is displayed in the **Category** list box (Fig.Calc-2.18).
4. *Select* the required function from the **Function** list box. In our case, we have selected the ABS function (Fig.Calc-2.18).
5. *Click* the **Next** button (Fig.Calc-2.18).
6. *Enter* the number of which you want to find the absolute value. In our case, we have entered the **-52** number (Fig.Calc-2.19).
7. *Click* the **OK** button (Fig.Calc-2.19).



Fig.Calc-2.18

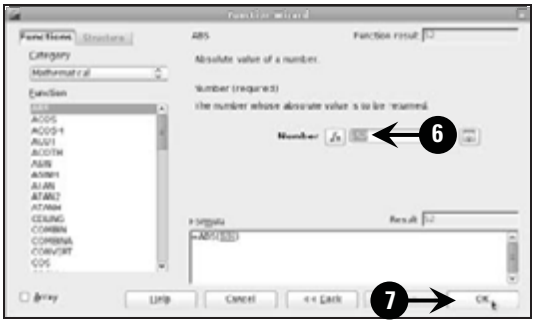


Fig.Calc-2.19

The selected cell in the spreadsheet shows the absolute value of the desired number, as shown in Fig.Calc-2.20:

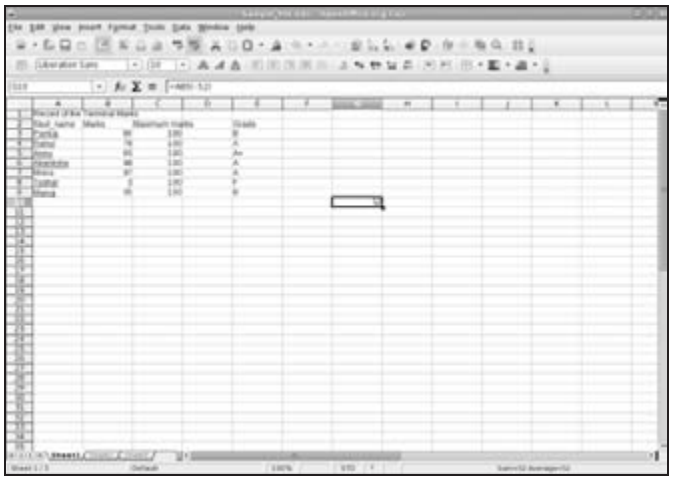


Fig.Calc-2.20

Let's now learn some commonly used text functions.

Working with the Text Functions

The text functions are used to convert the values in the cells to a prescribed text format. The following are some of the commonly used text functions:

- **CONCATENATE():** Joins specified text items into one
- **EXACT():** Checks if the two text values are identical
- **FIND():** Helps in finding text value within specified cell
- **REPLACE():** Replaces the character with existing text

Let's now discuss all these functions in detail.

The CONCATENATE() Function

The CONCATENATE() function is used to join two or more text strings into a single text string. The items to be joined could be text strings, numbers, or single-cell references. The following is the syntax for the CONCATENATE() function:

```
CONCATENATE("Text1"; ...; "Text30")
```

In the preceding syntax, text1, text2,... refer to text items that can be joined in a single text item. You can add a maximum number of values that a single spreadsheet contains is no. of rows * no. of columns.

Perform the following steps to combine different strings:

1. *Click* the function wizard button on the **Formula bar**. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.21).
3. *Select* the required category of function. In our case, we have selected the **Text** category (Fig.Calc-2.21).

   The **Text** category is displayed in the **Category** list box (Fig.Calc-2.22).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **CONCATENATE** function (Fig.Calc-2.22)
5. *Click* the **Next** button (Fig.Calc-2.22).

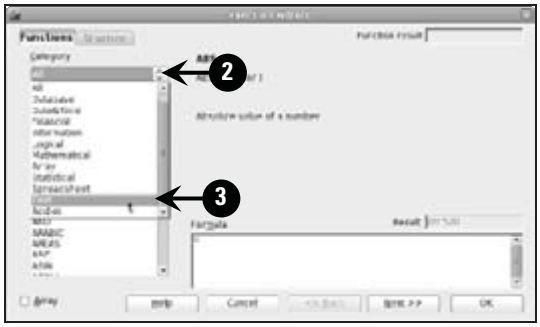


Fig.Calc-2.21

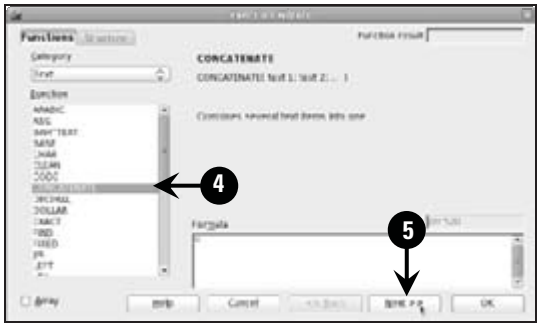


Fig.Calc-2.22

6. *Enter* the first string beside the **text 1** text box. In our case, the first string is **"sun"** (Fig.Calc-2.23).
7. *Enter* the second string beside the **text 2** text box. In our case, the second string is **"day"** (Fig.Calc-2.23).
8. *Click* the **OK** button, as shown in Fig.Calc-2.23:

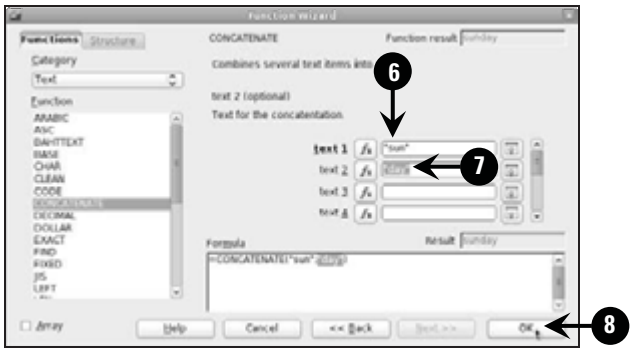


Fig.Calc-2.23

The different strings are concatenated, as shown in Fig.Calc-2.24:

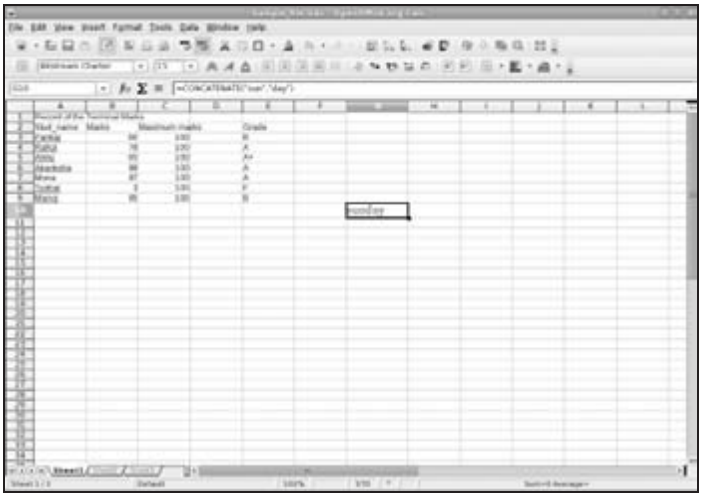


Fig.Calc-2.24

Let's now learn how to use the EXACT() function.

The EXACT() Function

The EXACT() function is used to check whether the two text strings are identical or not. If the two text strings are identical, then the function returns TRUE, otherwise it returns FALSE.

The arguments provided to EXACT() function are case-sensitive, which means that the text string **red** is not same as **rEd.** The following is the syntax for the EXACT function:

```
EXACT("Text1"; "Text2")
```

In the preceding syntax:

- **Text1:** Refers to the first text to compare
- **Text2:** Refers to the second text to compare

Perform the following steps to find whether strings are identical or not:

1. *Click* the function wizard button on the **Formula bar**. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.21).
3. Select the required category of function. In our case, we have selected the Text category. The Text category is displayed in the **Category** list box (Fig.Calc-2.25).

4. *Select* the required function from the **Function** list box. In our case, we have selected the **EXACT** function (Fig.Calc-2.25).
5. *Click* the **Next** button (Fig.Calc-2.25).
6. *Enter* the first text string in the **text_1 text box** option. In our case, the first string is "**red**" (Fig.Calc-2.26).
7. *Enter* the second text string in the **text_2 text box** option. In our case, the second string is "**rEd**" (Fig.Calc-2.26).
8. *Click* the **OK** button (Fig.Calc-2.26).

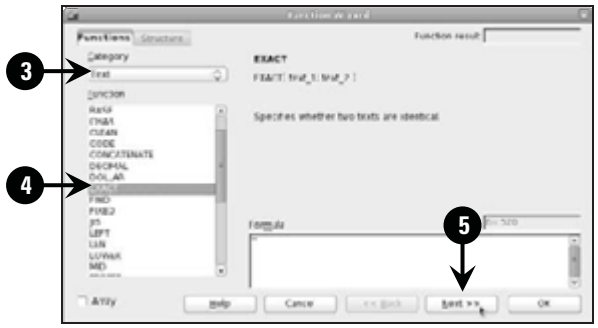


Fig.Calc-2.25

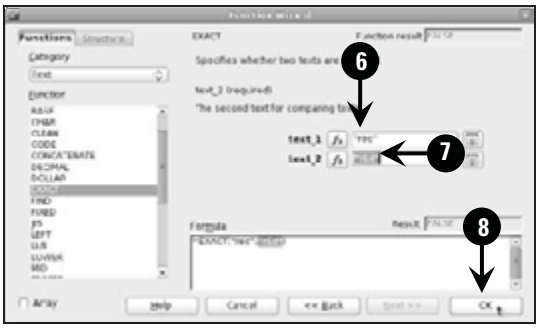


Fig.Calc-2.26

The result of the compared text strings is displayed in the selected cell. In our case, the result is FALSE, as shown in Fig.Calc-2.27:

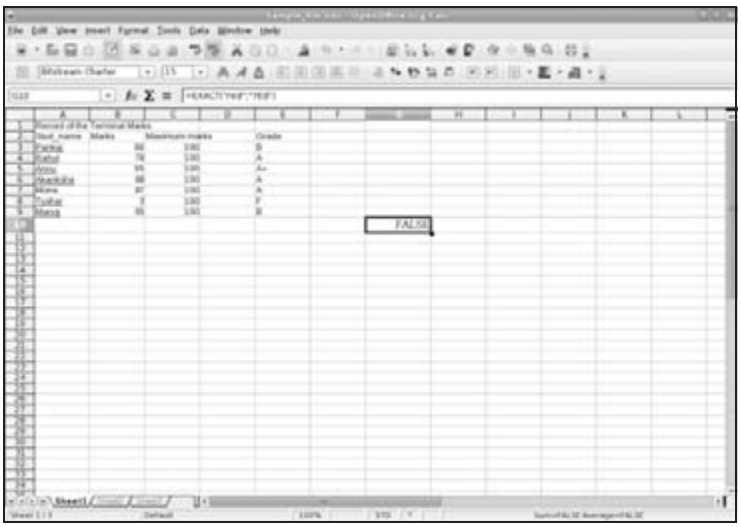


Fig.Calc-2.27

Let's now learn how to use the FIND() function.

The FIND() Function

The FIND() function is used to search value in spreadsheet. In this function, you can also define from where you want to begin the search. This case-sensitive function is intended to be used with a single-byte character set. The following is the syntax for the FIND() function:

```
FIND("FindText"; "Text"; Position)
```

In the preceding syntax:

- **FindText:** Refers to the text that is to be found.
- **Text:** Refers to the text for which the search takes place.
- **Position:** Refers to the position in the text from where the search starts. This parameter is optional.

Perform the following steps to learn how to locate a string from another string:

1. *Click* the function wizard button on the Formula bar. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.21).
3. *Select* the required category of function. In our case, we have selected the **Text** category displayed in the **Category** list box (Fig.Calc-2.28).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **FIND** function (Fig.Calc-2.28).
5. *Click* the **Next** button (Fig.Calc-2.28).
6. *Enter* the text that is to be found in the **find_text** text box. In our case, the text to be searched is **"or"** (Fig.Calc-2.29).
7. *Enter* the string from which to search text in the **text** text box. In our case, the string in which the search takes place is **"format"** (Fig.Calc-2.29).
8. *Click* the **OK** button (Fig.Calc-2.29).



Fig.Calc-2.28

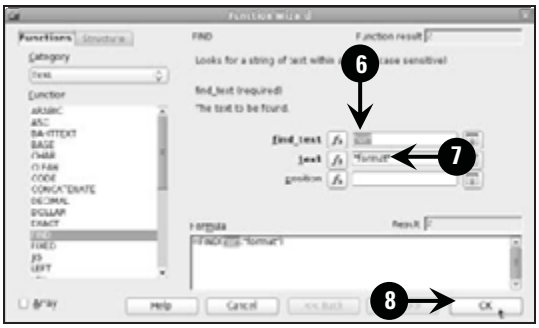


Fig.Calc-2.29

The starting position of the found string (in our case, it is **or**) appears in the selected cell, as shown in Fig.Calc-2.30:

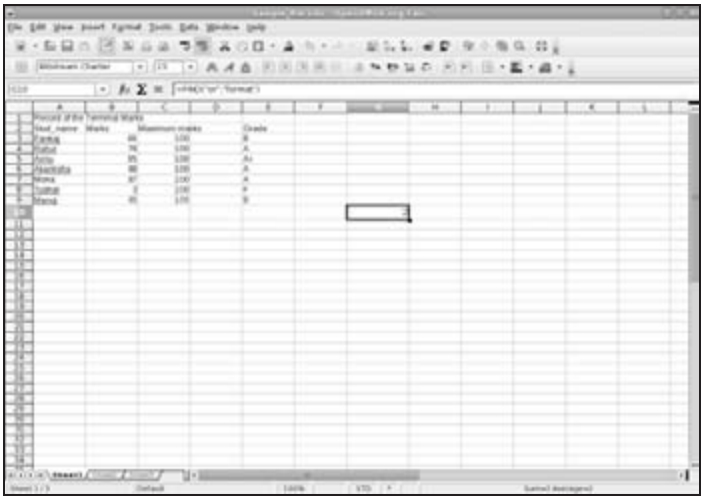


Fig.Calc-2.30

Let's now learn how to use the Replace() function.

The REPLACE()Function

The REPLACE() function replaces a part of the text string with a different text string. The text string is replaced on the basis of specified number of characters and bytes. The REPLACE() function always counts each character, whether single-byte or double-byte, as one, depending on the default language setting of your computer. The syntax for this function is as follows:

```
REPLACE("Text"; Position; Length; "NewText")
```

In the preceding syntax:

- **Text:** Refers to text of which a part will be replaced
- **Position:** Refers to the position within the text from where the replacement begins
- **Length:** Refers to the number of characters in the text to be replaced
- **NewText:** Refers to the text which replaces the existing text

Perform the following steps to replace the text:

1. *Click* the function wizard button on the Formula bar. The Function Wizard dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.21).
3. *Select* the required category of function. In our case, we have selected the **Text** category (Fig.Calc-2.21). The **Text** category is displayed in the **Category** list box (Fig.Calc-2.31).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **REPLACE** function (Fig.Calc-2.31).
5. *Click* the **Next** button, as shown in Fig.Calc-2.31:



Fig.Calc-2.31

6. *Enter* the text that is to be replaced in the **Text** text box. In our case, the text to be replaced is "**Pankaj**" (Fig.Calc-2.32).
7. *Enter* the position of text in the **position** text box. In our case, the position is **1** (Fig.Calc-2.32).
8. *Enter* the length of text in the **length** text box. In our case, the length of the text is **6** (Fig.Calc-2.32).
9. *Enter* the new text in the **new text** text box. In our case, the new text is "**Varun**" (Fig.Calc-2.32).
10. *Click* the **OK** button, as shown in Fig.Calc-2.32:

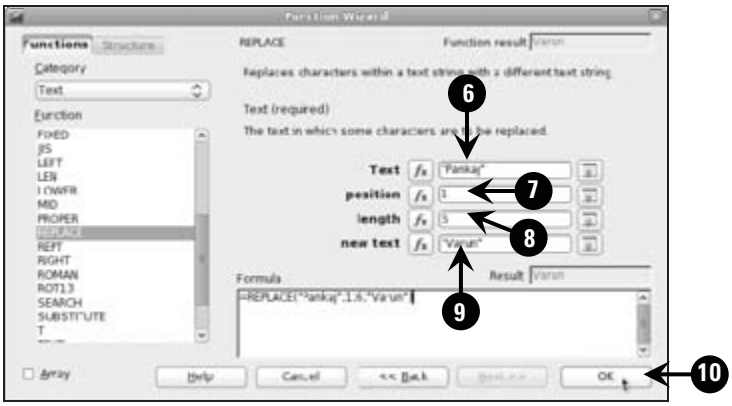


Fig.Calc-2.32

The text gets replaced with the new text, as shown in Fig.Calc-2.33:

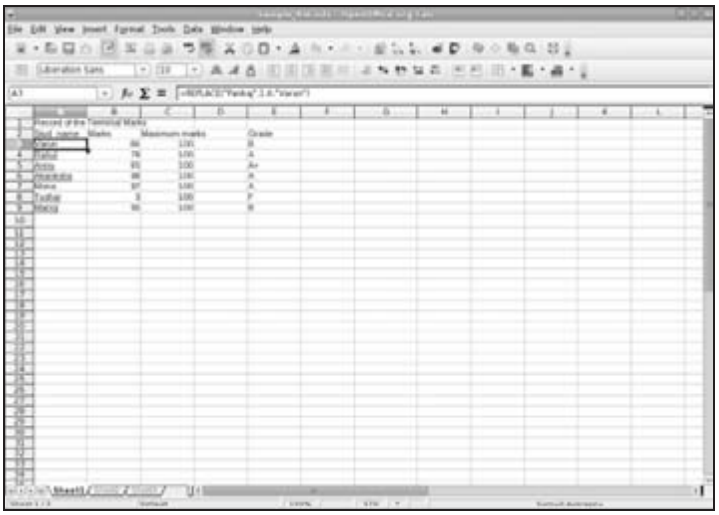


Fig.Calc-2.33

Let's now learn about common spreadsheet functions.

Working with the Spreadsheet Functions

A spreadsheet is a tabular representation of data. The data is arranged in rows and columns, making it easier to store, organize, and analyze the information. Openoffice.org Calc is a program that is specifically designed to process data in the tabular format. The data entered in the spreadsheet cells may be numerical or textual.. The spreadsheet supports the following functions:

- ADDRESS() function
- COLUMN() function
- ROW() function

Let's discuss each of these functions in detail.

The ADDRESS() Function

The ADDRESS() function returns a cell address (reference) as text, according to the specified row and column numbers. You can determine whether the address is interpreted as an absolute address (for

example, A1), relative address (as A1) or mixed form (A$1 or $A1). You can also specify the name of the sheet. The following is the syntax for the ADDRESS() function:

```
ADDRESS(Row; Column; Abs; "Sheet")
```

In the preceding syntax:

- **Row:** Represents the row number for the cell reference.
- **Column:** Represents the column number for the cell reference.
- **ABS:** Determines the type of reference.
- **Sheet:** Represents the name of the sheet. It must be placed in double quotes.

Perform the following steps to find the address of a cell:

1. *Click* the function wizard button on the Formula bar. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.34).
3. *Select* the required category of function. In our case, we have selected the **Spreadsheet** category (Fig.Calc-2.34).

   The Spreadsheet category is displayed in the **Category** list box (Fig.Calc-2.35).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **ADDRESS** function (Fig.Calc-2.35).
5. *Click* the **Next** button (Fig.Calc-2.35).



Fig.Calc-2.34

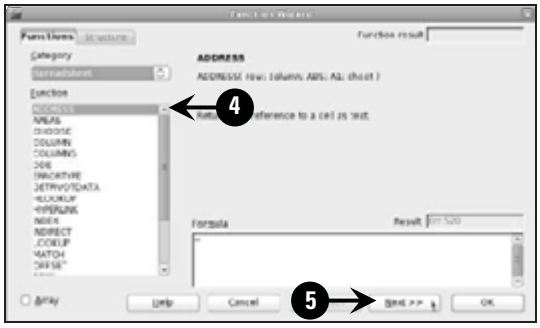


Fig.Calc-2.35

6. *Enter* the row number of the cell for which you want to find the address in the **row** text box. In our case, we have entered **3** (Fig.Calc-2.36).
7. *Enter* the column number of the cell for which you want to find the address in the **column** text box. In our case, we have entered **3** (Fig.Calc-2.36).
8. *Click* the **OK** button, as shown in Fig.Calc-2.36:

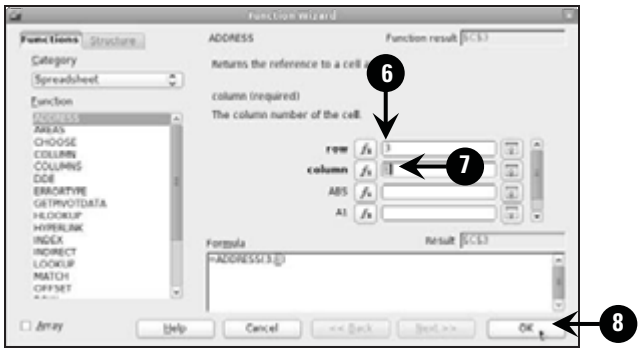


Fig.Calc-2.36



ABS and A1 are the optional parameters.

The address of the cell appears, as shown in Fig.Calc-2.37:

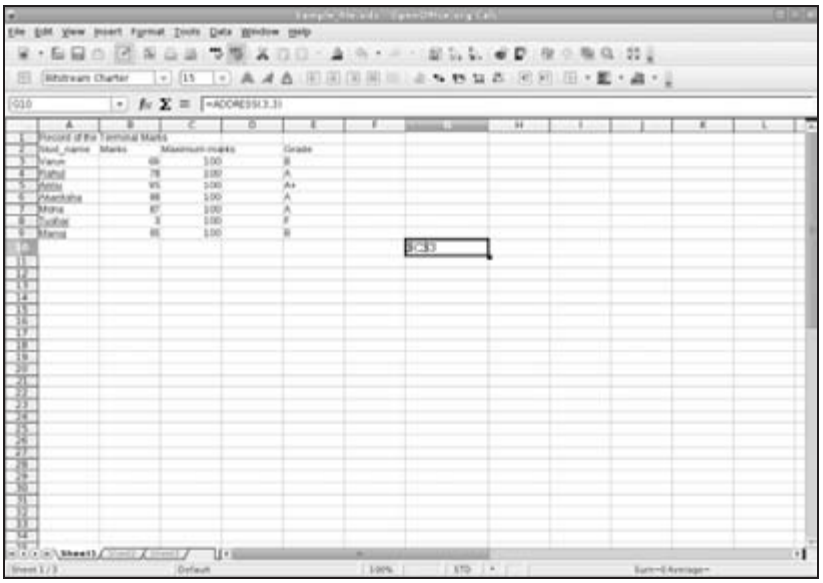


Fig.Calc-2.37

Let's now learn about the COLUMN() function.

The COLUMN() Function

The COLUMN() function provides you with the column number of the selected cell. The COLUMN() function has the following syntax:

```
COLUMN(Reference)
```

In the preceding syntax, **Reference** refers to a cell or cell area whose first column number is to be found.

If no reference is provided as an input, only the column number containing the formula is returned.

Perform the following steps to find the column number of a cell:

1. *Click* the function wizard button on the Formula bar. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box (Fig.Calc-2.34).
3. *Select* the required category of function. In our case, we have selected the **Spreadsheet** category displayed in the **Category** list box (Fig.Calc-2.38).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **COLUMN** function (Fig.Calc-2.38).
5. *Click* the **Next** button (Fig.Calc-2.38).
6. *Enter* the address of the cell besides the **reference** text box. In our case, we have entered **B6** (Fig.Calc-2.39).
7. *Click* the **OK** button (Fig.Calc-2.39).

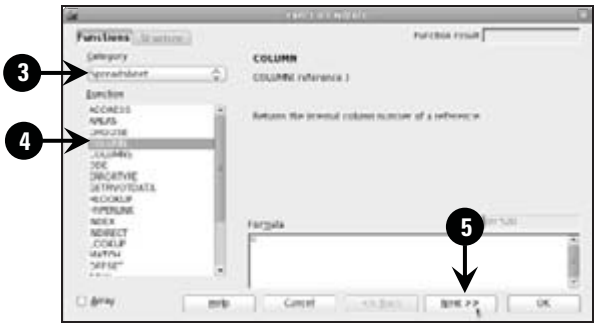


Fig.Calc-2.38

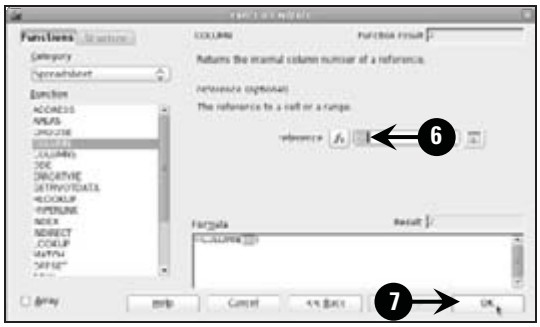


Fig.Calc-2.39

The column number appears. In our case, we have specified the **B6** cell. Therefore, the column number of the **B6** cell is **2,** as shown in Fig.Calc-2.40:

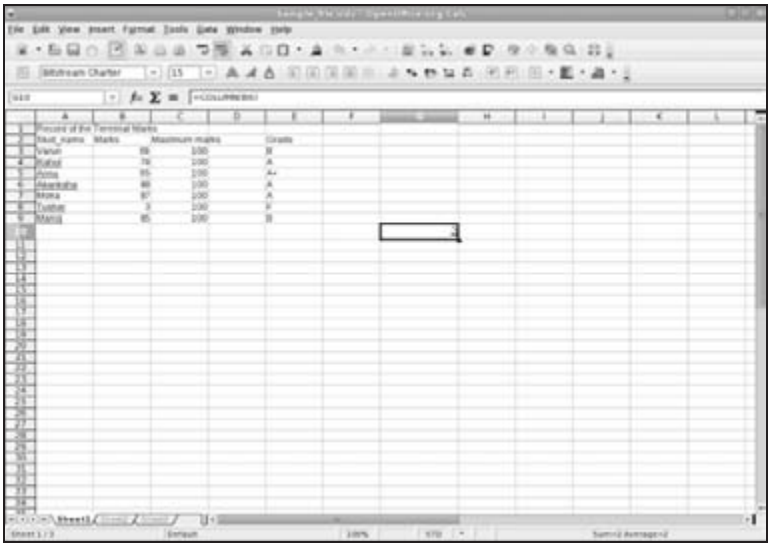


Fig.Calc-2.40

Let's now learn about the ROW() function.

The ROW() Function

The ROW() function returns the row number of a cell reference. If the reference is a cell, it returns the row number of the cell. The ROW function has the following syntax:

```
ROW(Reference)
```

In the preceding syntax, **Reference** refers to a cell. If no reference is provided as an input, only the row number containing the formula is returned.

Perform the following steps to find the row number:

1. *Click* the function wizard button on the Formula bar. The **Function Wizard** dialog box appears (Fig.Calc-2.1).
2. *Click* the up-down arrow on the **Category** list box.
3. *Select* the required category of function (Fig.Calc-2.34). In our case, we have selected the **Spreadsheet** category displayed in the **Category** list box (Fig.Calc-2.41).
4. *Select* the required function from the **Function** list box. In our case, we have selected the **ROW** function (Fig.Calc-2.41).

5. *Click* the **Next** button (Fig.Calc-2.41).
6. *Enter* the address of the cell in the **reference** text box. In our case, we have entered **C5** (Fig.Calc-2.42).
7. *Click* the **OK** button (Fig.Calc-2.42).

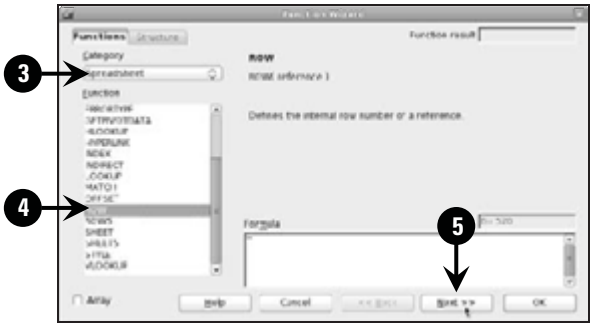


Fig.Calc-2.41

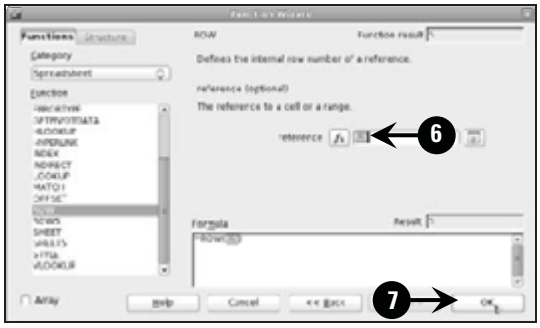


Fig.Calc-2.42

The row number appears. In our case, the number of row is 5, as shown in Fig.Calc-2.43:

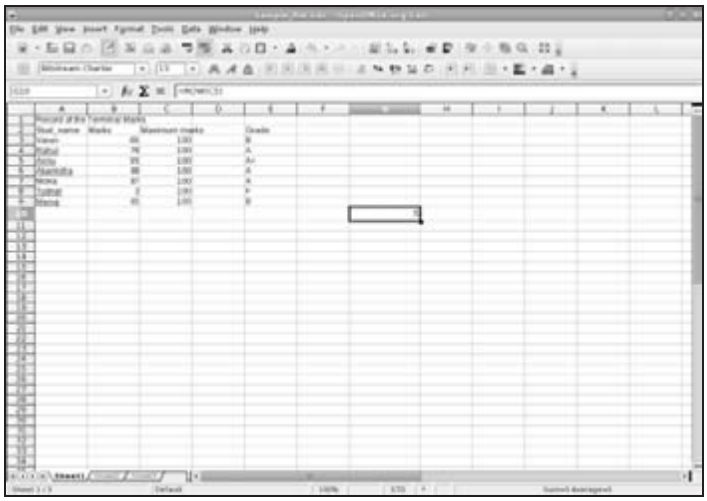


Fig.Calc-2.43

Let's now learn how to apply a function automatically to other cells.

Applying a Function Automatically to Other Cells

In OpenOffice.org Calc, you can avoid typing the same formula with different cell addresses again and again. OpenOffice.org Calc enables you to copy a formula from one cell to another and automatically computes the result based on the corresponding cell addresses for a record. For example, a formula that should calculate the values of cells C2 through C7 is typed in cell D8. When you copy this formula to C8, OpenOffice.org Calc automatically computes the total of values from C2 through C7. In our case, we have typed a formula in a cell B10 to calculate the values of cells B3 through B9, and we copy this formula to C10, which calculates the value of cells C3:C9.

Perform the following steps to copy a formula:

1. *Select* the cell that contains the formula. In our case, the selected cell is B10, as shown in Fig.Calc-2.44:

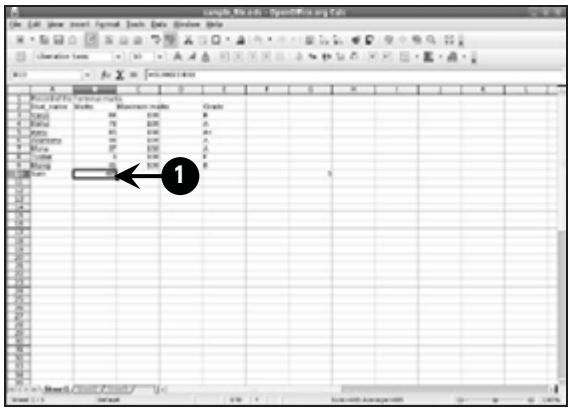


Fig.Calc-2.44

2. *Place* the mouse-pointer at the bottom-right of the active cell. The mouse-pointer changes to a crosshair cursor, as shown in Fig.Calc-2.45:

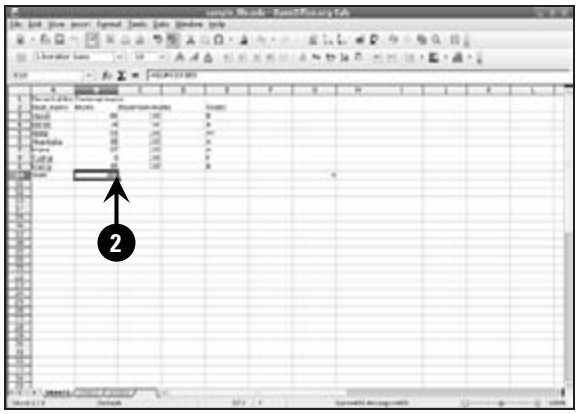


Fig.Calc-2.45

3. *Press* the mouse button (Fig.Calc-2.46).
4. *Drag* the mouse-pointer to the cell where you want to copy the formula, as shown in Fig.Calc-2.46:

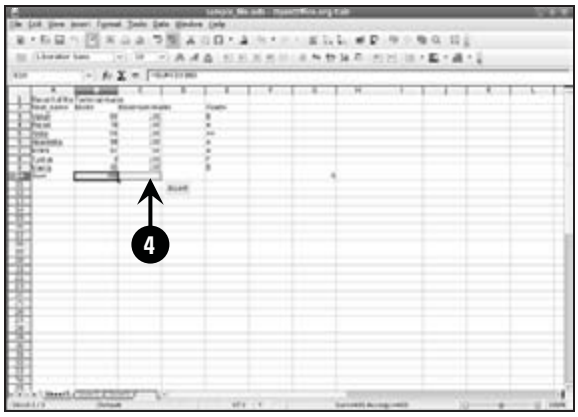


Fig.Calc-2.46

As soon as you release the mouse, the **Fill Series** dialog box appears (Fig.Calc-2.47).

5. *Select* the direction under the **Direction** section group (Fig.Calc-2.47). By default, the **Right** radio button is selected.
6. *Select* the **Formulas** radio button under the **Series type** section group (Fig.Calc-2.47).
7. *Click* the **OK** button, as shown in Fig.Calc-2.47:

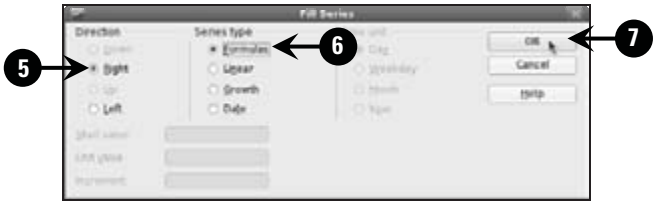


Fig.Calc-2.47

The formula is applied to the selected cell and it shows the computed result, as shown in Fig.Calc-2.48:

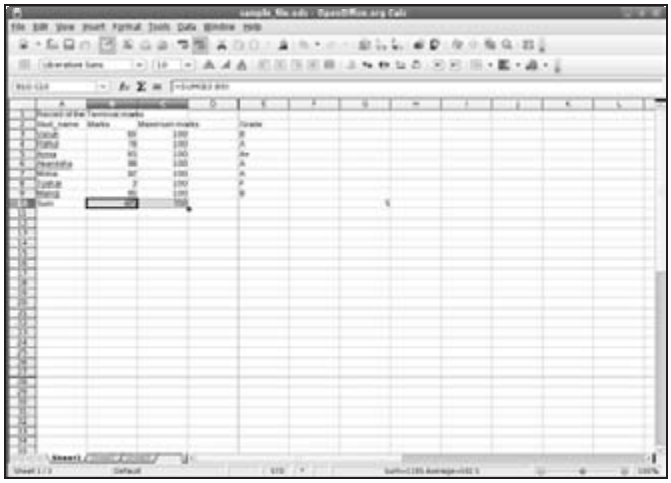


Fig.Calc-2.48

After exploring different categories of functions, let's get acquainted with operators.

Working with Operators

Operators refer to the symbols that are used in formulas. You can define a relationship and perform an action between two or more cell references and values by using an operator. Consider an example, **=A1+B1,** where **A1** and **B1** are two cell references and are used with the **+** operator**.** In this example, the values in the **A1** and **B1** cells are added.

In this case, the operator used is the plus sign. In addition to this operator, there are many different arithmetical, comparative, text, and reference operators used in OpenOffice.org Calc. Operators are briefly described in the following section. Let's begin with the arithmetical operators.

The Arithmetical Operators

The arithmetical operators are the operators used to perform the basic functions, such as addition, subtraction, multiplication, or division. The output of these functions is in the numeric format. Table 2.2 shows the commonly used arithmetical operators:

Table 2.2: List of Arithmetical Operators			
Operator	**Name**	**Description**	**Example**
+ (Plus)	Addition	Adds the values	3+2
- (Minus)	Subtraction	Gives the difference between the values	28-25
- (Minus)	Negation	Changes the sign of a value	-6
* (asterisk)	Multiplication	Gives the product of values	8*6
/ (Slash)	Division	Gives the resultant of values	88/4
% (Percent)	Percent	Gives the output as a percentage	15.00%

Let's now discuss comparative operators.

The Comparative Operators

The Comparative operators are used to compare two values or expressions. The output is returned as a logical value. These logical values are TRUE and FALSE. Table 2.3 lists some comparative operators:

Table 2.3: List of Comparative Operators			
Operator	**Name**	**Description**	**Example**
= (equal sign)	Equal	Returns true if A1 equals B1 and false if A1 is not equal to B1	A1=B1
> (Greater than)	Greater than	Returns true if A1 is greater than B1 and false if A1 is less than B1	A1>B1
< (Less than)	Less than	Returns true if A1 is less than B1 and false if A1 is greater than B1	A1<B1
>= (Greater than or equal to)	Greater than or equal to	Returns true if A1 is equal or greater than B1 or false if A1 is less than B1	A1>=B1
<= (Less than or equal to)	Less than or equal to	Returns true if A1 is equal or and less than B1 or false if A1 is greater than B1	A1<=B1
<> (Inequality)	Inequality	Returns true in the case when A1 is not equals to B1 and return false when A1 is equals to B1 and vice-versa	A1<>B1

Let's now discuss the text operator.

The Text Operator

The text operator is used in cases where you want to concatenate the text pieces, characters, and values. These text pieces can be present in different cells of a spreadsheet. The text operator used to combine the text is shown in Table 2.4:

Table 2.4: The Text Operator			
Operator	**Name**	**Description**	**Example**
& (And)	Text concatenation AND	Combines various individual text entries	"Sun" and "day" is "Sunday"

The Reference Operators

The Reference operators are used to merge different cell ranges. A range can also be a reference operator, which is referenced in formulas, functions, and logical operators. Table 2.5 shows commonly used reference operators:

Table 2.5: List of Reference Operators

Table 2.5: The Text Operator			
Operator	**Name**	**Description**	**Example**
: (Colon)	Range	Selects the cells defined by the range.	A1:C108
! (Exclamation point)	Intersection	Yields the values of cells in calculation that are intersecting in specified range.	SUM(A1:B6!B5:C12)
~ (Tilde)	Concatenation or union	Takes two references and returns a reference list, which is a concatenation of the left reference followed by the right reference. Double entries are referenced twice.	A1:B2~C3:D4

Let's briefly discuss relative cell addressing in the following section.

Introducing Relative Cell Addressing

Relative cell addressing refers to the addresses of the rows and columns at a particular distance from the formula cell. This way you can copy the formula from one cell to other and do calculations on the data of the corresponding cells.

In relative cell addressing, the calculations are done depending on the relative position of the cells containing the data from the formula cell. The cell in which you enter a formula is known as a formula cell. For example, formula to calculate the sum of values in B5, C5, and D5, is contained in E5. If this formula is moved to E6, then the sum of values in B6, C6, and D6 is computed.

Let's now describe absolute cell addressing.

Introducing Absolute Cell Addressing

When you refer to the value of a cell rather than the cell address, it is known as absolute cell addressing or absolute cell referencing. In case of absolute cell addressing, the value of a cell is kept constant. If you copy a formula containing a relative cell address, then the value of the corresponding cell is not taken in the formula. For example, a formula is entered in a cell F2 that calculates the sum of values in C2, D2, and E2. Now, if you copy the formula to cell F3, it calculates the sum of values present in the cells C3, D3, and E3. However, if we keep the value of C2 constant and copy the formula to cell F3, then the formula in the cell F3, calculates the sum of values present in C2, D3, and E3 cells.

Absolute cell addressing is applied by prefixing the a dollar sign ($) with the row and cell names of a cell ($). For example, to make the value in the cell C2 constant, type it as C2.

With this, we come to the end of this chapter. Let's recapitulate the main topics discussed in the chapter.

Summary

You began this chapter by describing the usage of a cell range. You have learned about various categories of commonly used functions, such as date and time, logical, mathematical, text, and spreadsheet, in OpenOffice.org Calc. The chapter also discussed different types of operators, such as text, arithmetic, comparative, and reference. Finally, you have explored relative and absolute cell addressing.

CHAPTER

3

Working with the OpenOffice.org Calc Layout

In this Chapter:

- Opening an Existing Calc Spreadsheet
- Inserting a New Spreadsheet
- Copying the Content of a Spreadsheet
- Moving the Data
- Moving the Spreadsheet
- Renaming the Spreadsheet
- Deleting a Spreadsheet
- Working with Rows and Columns
- Undoing an Action
- Inserting a Series
- Changing the Column Width
- Hiding a Column
- Changing the Row Height
- Aligning the Data
- Formatting the Data
- Applying Font Effects
- Applying a border to a Cell
- Exploring the AutoFormat Feature
- Working with Graphs

- Sorting the Data in a Spreadsheet
- Setting the AutoSave Feature
- Protecting a Spreadsheet
- Saving the Changes Made to a Spreadsheet
- Printing the Spreadsheet

OpenOffice.org Calc application helps you to organize and calculate the data, particularly the numerical data. In Calc, each file is called a spreadsheet. A spreadsheet is a large grid of rows and columns in which you can enter data, formulas, and other information. The intersection of rows and columns is known as a cell. A spreadsheet enables you to perform various tasks, such as keeping track of personal finances. It helps you to easily organize data in the form of graphs. It allows you to protect your spreadsheet by assigning a password to it, so that other users cannot access your spreadsheet.

In this chapter, you learn how to open an existing OpenOffice.org Calc spreadsheet and insert a new spreadsheet in the OpenOffice.org Calc workbook. Next, you learn to perform various operations, such as copying and moving the content or data inside the spreadsheet. You also learn how to move, rename, and delete a spreadsheet. Further, you learn to work with rows and columns. In addition, you learn to perform various tasks, such as undoing an action, inserting a series, changing the width of a column, hiding a column, changing the height of a row, aligning the data. You also learn how to format the data and apply various formatting styles, such as font effects and cell border, to the content of the spreadsheet. This chapter also describes the AutoFormat feature. You also learn about graphs. You also learn how to sort the data and set the AutoSave feature. You also learn how to protect a spreadsheet. In the end, you learn how to save and print the spreadsheet.

Let's begin with opening an existing OpenOffice.org Calc spreadsheet.

Opening an Existing OpenOffice.org Calc Spreadsheet

An existing spreadsheet can be opened to view it or work in it. You can open an existing spreadsheet either directly from its location by double-clicking it or from the File menu.

Let's perform the following steps to open an existing spreadsheet:

1. *Select* the **Applications** menu from the top panel of the Desktop. A drop-down menu appears (Fig.Calc-3.1).
2. *Select* the **Office** option from the drop-down menu. A sub-menu appears (Fig.Calc-3.1).
3. *Select* the **OpenOffice.org Calc** option from the sub-menu, as shown in Fig.Calc-3.1:



Fig.Calc-3.1

The **Untitled 1-OpenOffice.org Calc** window appears (Fig.Calc-3.2).

4. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.2).
5. *Select* the **Open** option from the drop-down menu, as shown in Fig.Calc-3.2:

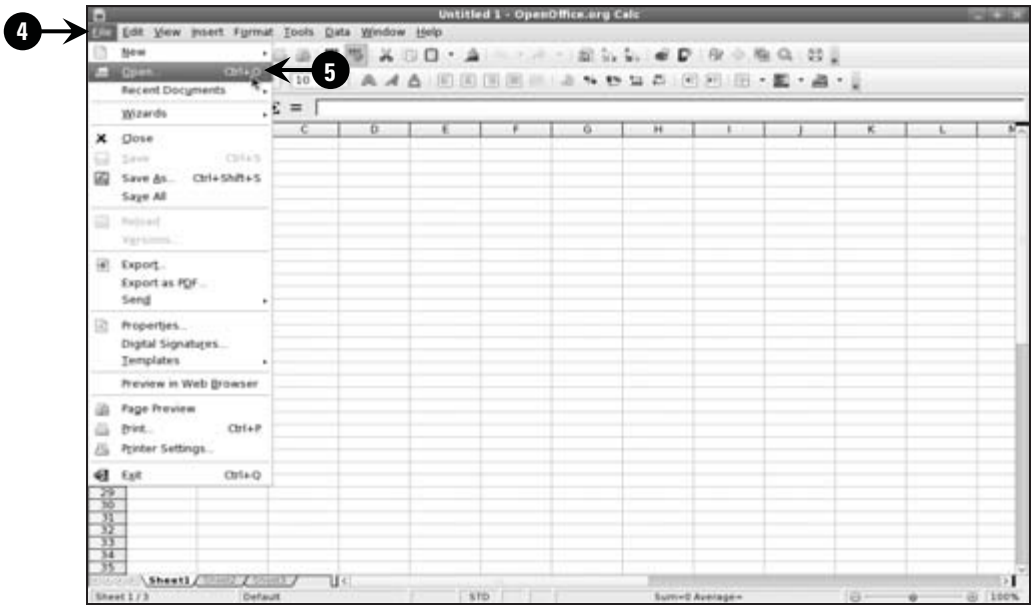


Fig.Calc-3.2

The **Open** dialog box appears (Fig.Calc-3.3).

6. *Select* the location from where you want to open an existing spreadsheet under the **Places** pane. In our case, we have selected the **Documents** location (Fig.Calc-3.3).
7. *Select* an existing OpenOffice.org Calc file from the **Documents** pane. In our case, we have selected the **Result_Spreadsheet.ods** file (Fig.Calc-3.3).
8. *Click* the **Open** button, as shown in Fig. Calc-3.3:

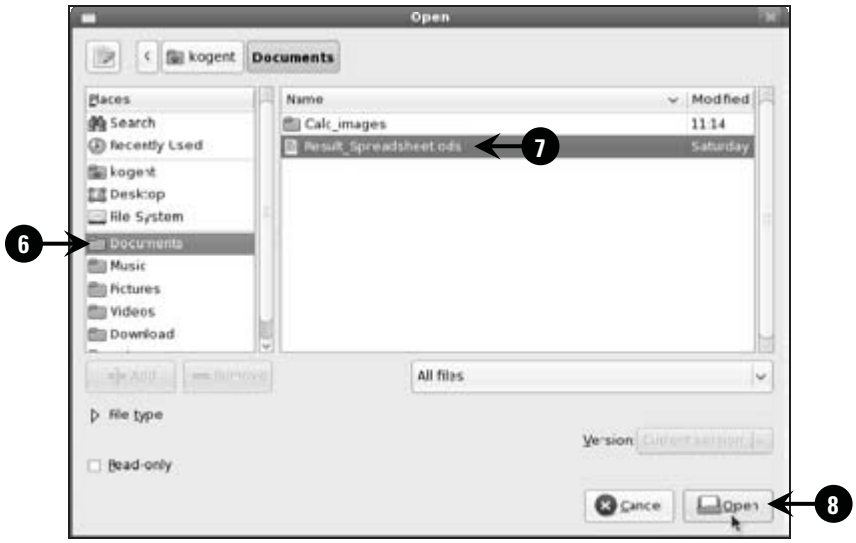


Fig.Calc-3.3

The Result_Spreadsheet.ods spreadsheet opens, as shown in Fig.Calc-3.4:

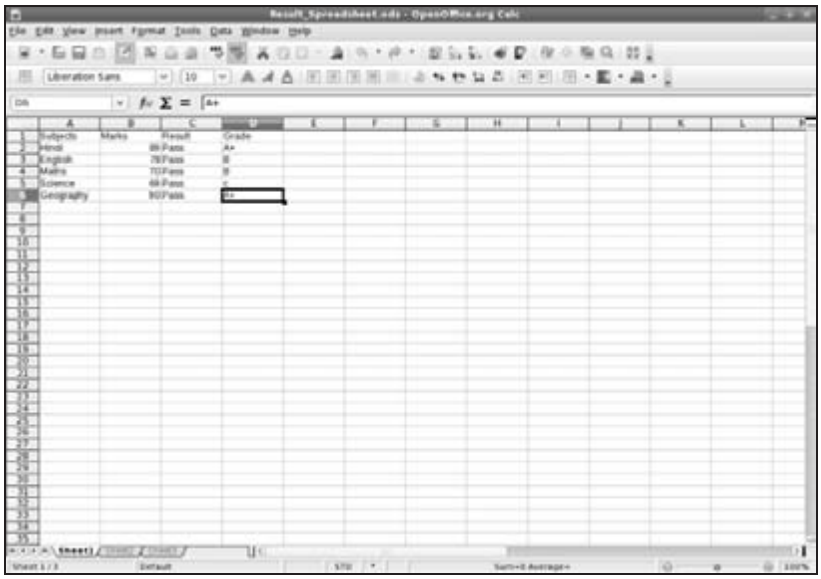


Fig.Calc-3.4

After learning to open the existing spreadsheet, let's learn how to insert a new spreadsheet in a workbook.

Inserting a New Spreadsheet

OpenOffice.org Calc provides three spreadsheets by default, named Sheet1, Sheet2, and Sheet3. However, you can insert more spreadsheets as per your requirement. You can insert the new sheet either before or after the current sheet.

Let's perform the following steps to insert a new spreadsheet:

1. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.5).
2. *Select* the **Sheet** option from the drop-down menu, as shown in Fig.Calc-3.5:

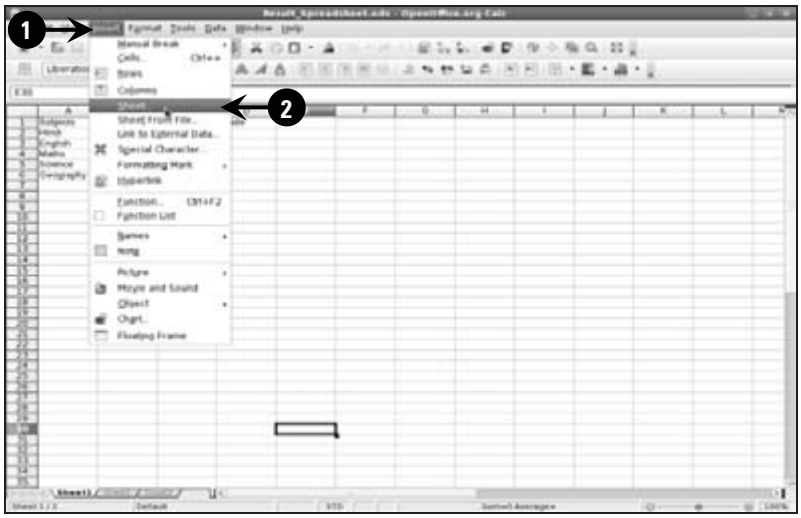


Fig.Calc-3.5

The **Insert Sheet** dialog box appears, as shown in Fig.Calc-3.6:

3. *Select* the required position under the **Position** category. By default, the **Before current sheet** radio button is selected. In our case, we have selected the **After current sheet** radio button (Fig.Calc-3.6).
4. *Click* the **OK** button, as shown in Fig.Calc-3.6:



Fig.Calc-3.6

A new spreadsheet named **Sheet4** is inserted after Sheet1 in the Result_Spreadsheet.ods spreadsheet, as shown in Fig.Calc-3.7:

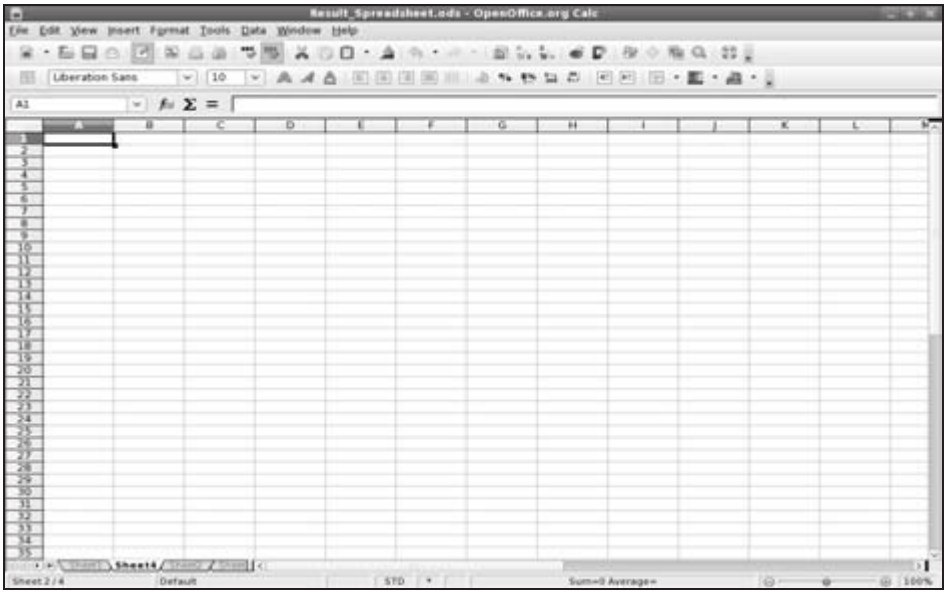


Fig.Calc-3.7

After learning to insert a new spreadsheet, let's learn to copy the content of a spreadsheet.

Copying the Content of a Spreadsheet

You can copy the content or attributes, such as formulas, formats, or comments, of a specific cell of a spreadsheet and paste it in another spreadsheet by using the Copy option of the Edit menu.

Let's perform the following steps to copy the content of a spreadsheet:

1. *Select* the content that you want to copy, as shown in Fig.Calc-3.8:

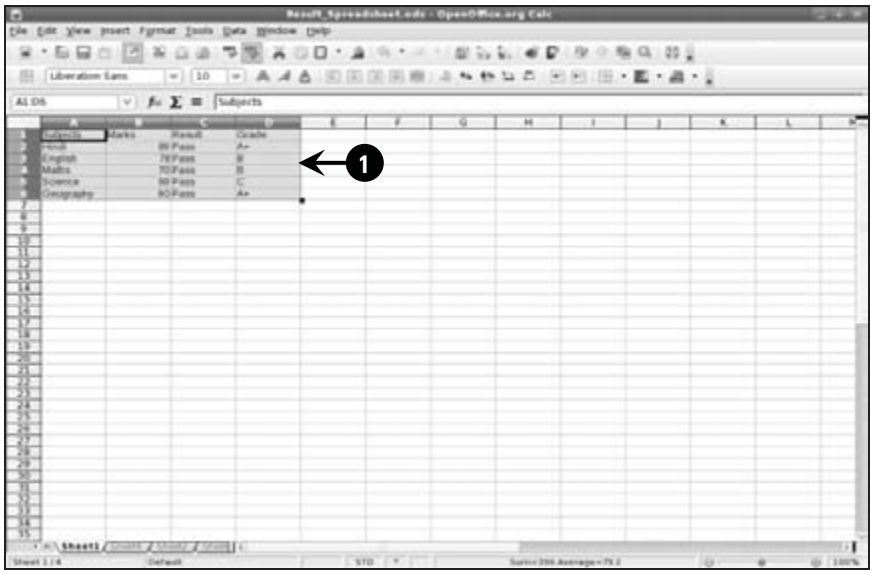


Fig.Calc-3.8

2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.9).
3. Select the **Copy** option, as shown in Fig.Calc-3.9:

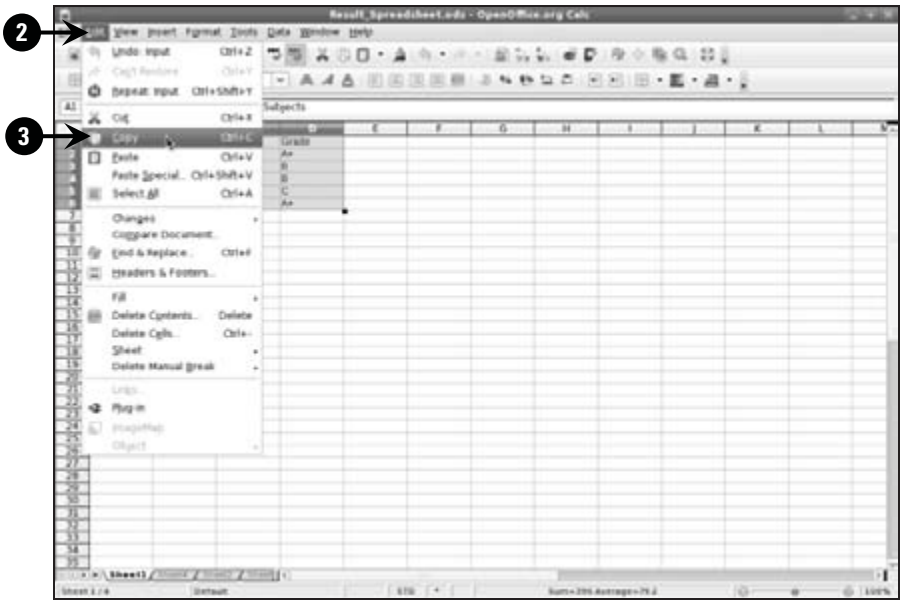


Fig.Calc-3.9

4. *Move* the mouse pointer to the required sheet and click it. In our case, we have selected **Sheet4**. The Sheet4 gets open (Fig.Calc-3.10).
5. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.10).
6. *Select* the **Paste** option, as shown in Fig.Calc-3.10:

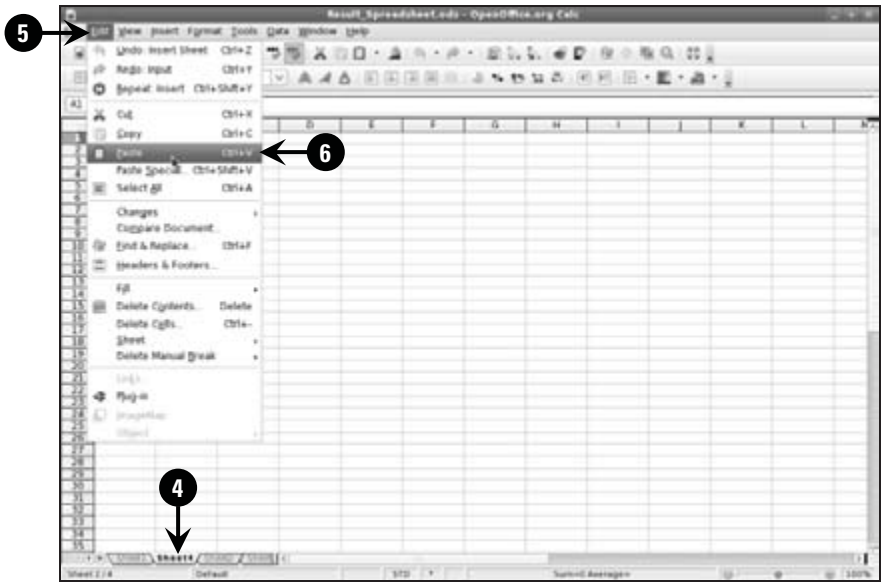


Fig.Calc-3.10

The data is copied into Sheet4, as shown in Fig.Calc-3.11:

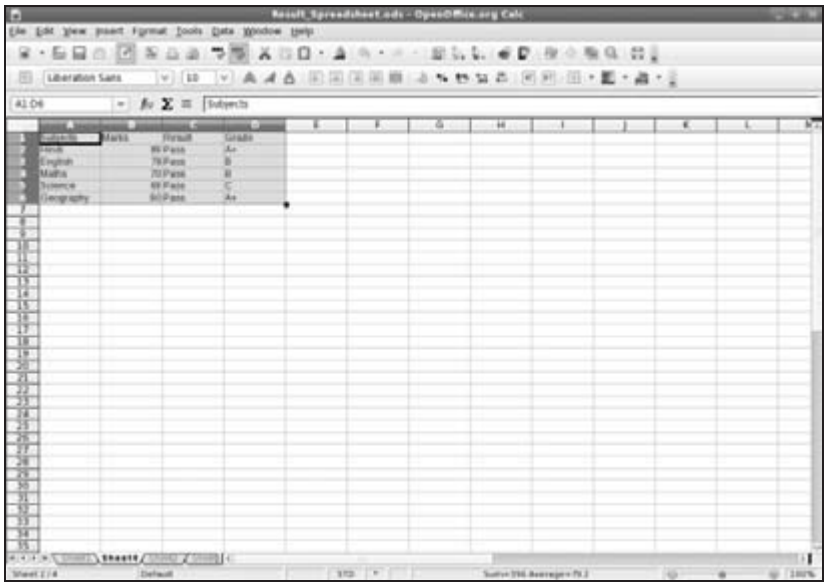


Fig.Calc-3.11

After learning about copying the content of the spreadsheet, let's learn how to move the data in the spreadsheet.

Moving the Data

When you copy some data from one location to the other, the copy of the data gets pasted at the destination location. This implies that when you copy the data, the copied data is present at both, the original and destination locations. However, when you move the data from one location to another, it is moved from its original location and placed at a new location.

Let's perform the following step to move the data in the spreadsheet:

1. *Select* the data that you want to move from the spreadsheet. In our case we have *select* the data present in the **B1** cell (Fig.Calc-3.12).
2. *Drag* the mouse pointer over the data that you want to move to select it, as shown in Fig.Calc-3.12:

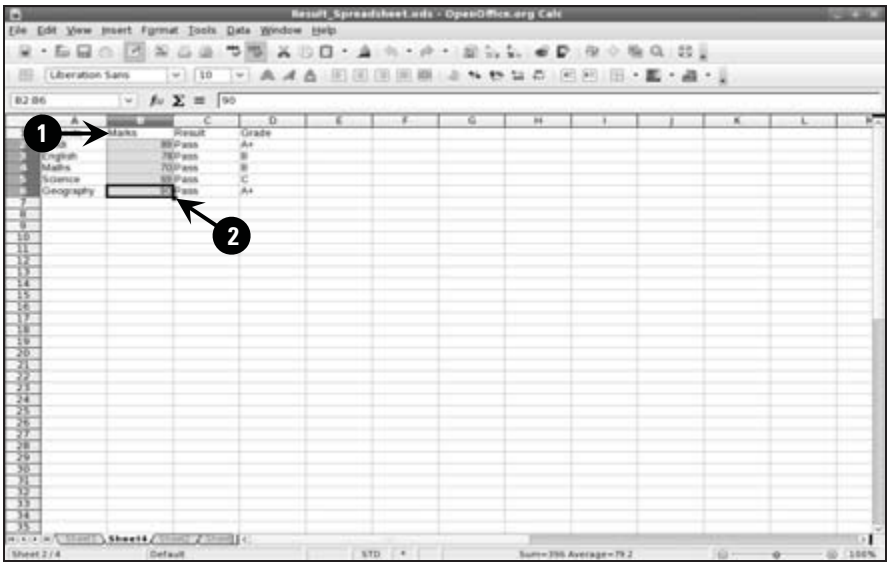


Fig.Calc-3.12

3. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc3.13).
4. *Select* the **Cut** option, as shown in Fig.Calc-3.13:

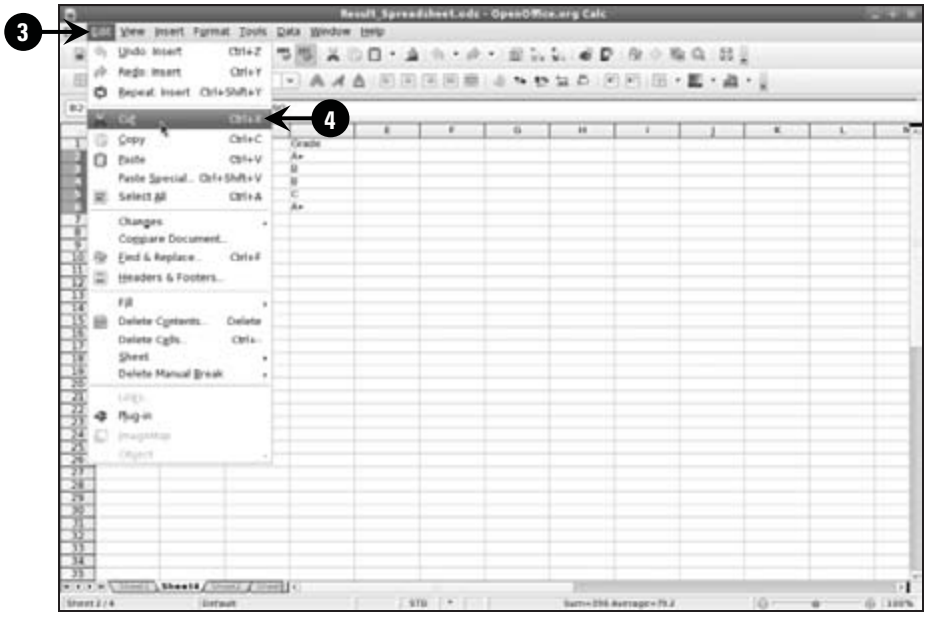


Fig.Calc-3.13

5. *Select* the cell where you want to paste the. In our case, we have selected cell E14 to paste the data (Fig.Calc-3.14).
6. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.14).
7. *Select* the **Paste** option from the drop-down menu, as shown in Fig.Calc-3.14:

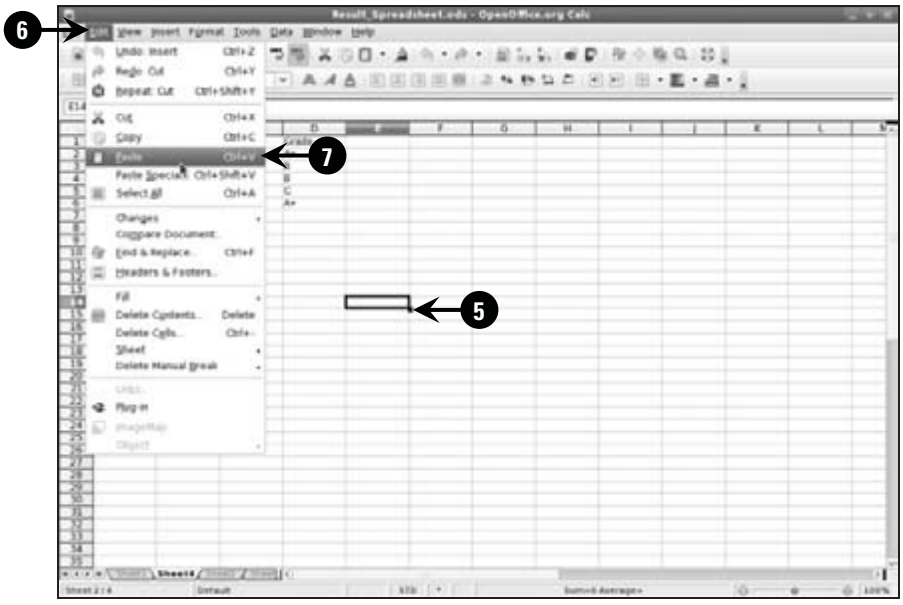


Fig.Calc-3.14

The data is moved to the selected location (in our case, **E14:E18 cell** range of Sheet4), as shown in Fig.Calc-3.15:

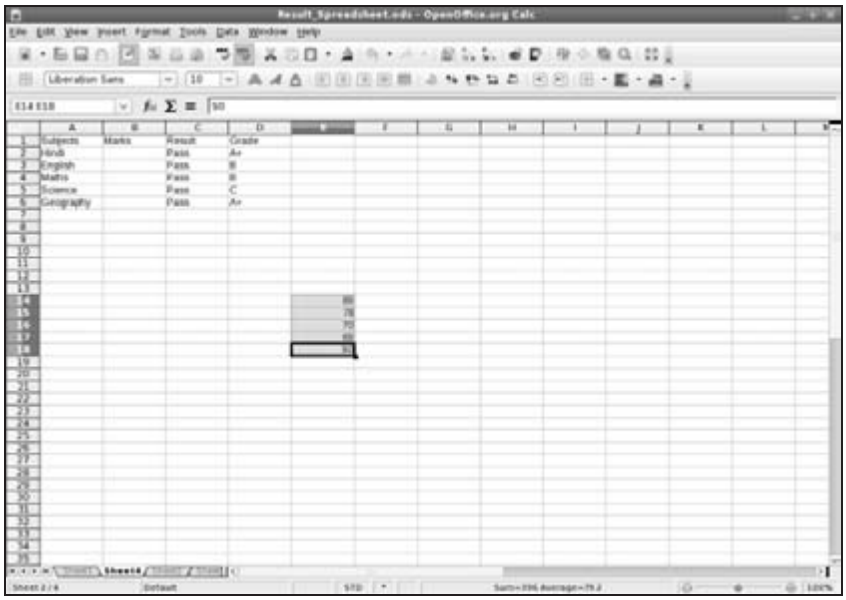


Fig.Calc-3.15

After learning about moving the data, let's now learn how to move the spreadsheet.

Moving the Spreadsheet

As discussed, the OpenOffice.org Calc application provides three spreadsheets by default. You can arrange these spreadsheets and also the newly inserted spreadsheets according to the importance of your data.

Let's perform the following step to move the spreadsheet:

1. *Select* the desired sheet that you want to move. In our case, we have selected Sheet4, as shown in Fig.Calc-3.16:

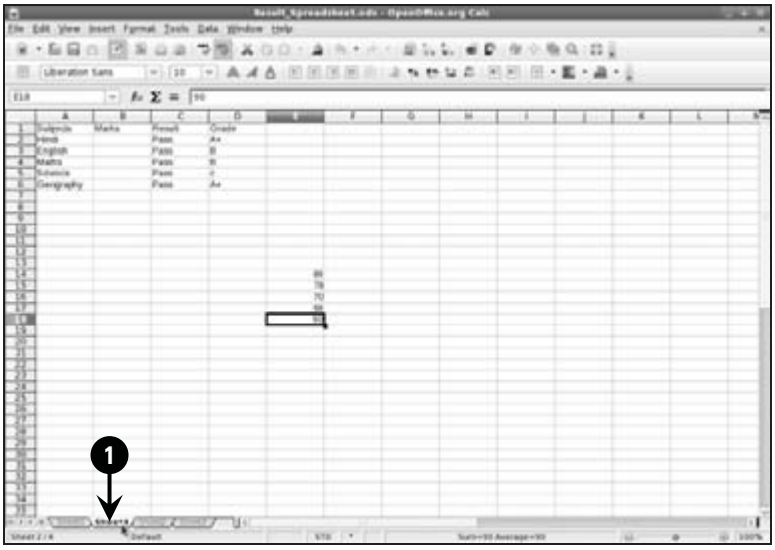


Fig.Calc-3.16

2. *Press* the left mouse button and *drag* Sheet4 before Sheet1.

   Sheet4 is moved and placed before **Sheet1**, as shown in Fig.Calc-3.17:

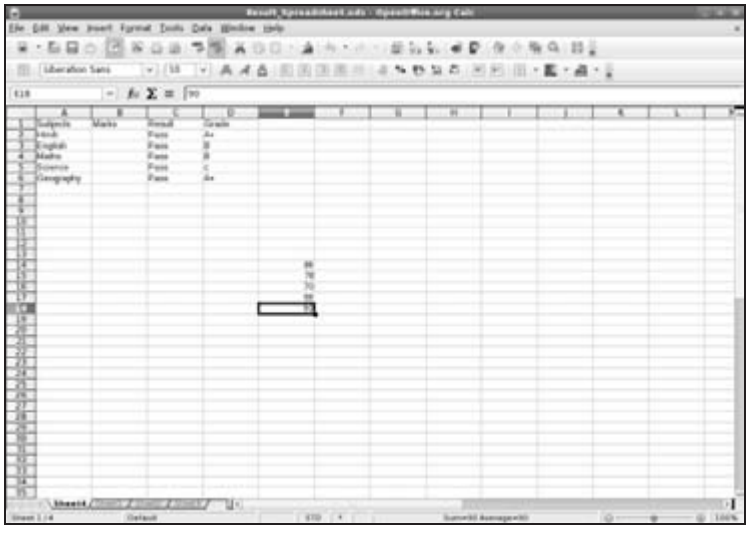


Fig.Calc-3.17

After learning about moving the spreadsheet, let's now learn about renaming the spreadsheet.

Renaming the Spreadsheet

The names of spreadsheets may cause confusion while working with larger or complex document. You can avoid such confusion by renaming these spreadsheets.

Let's perform the following steps to rename the spreadsheet:

1. *Select* the sheet that you want to rename. In our case, we have selected **Sheet4 (**Fig.Calc-3.18).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.18).
3. *Select* the **Sheet** option from the drop-down menu. A sub menu appears (Fig.Calc-3.18).
4. *Select* the **Rename** option from the sub menu, as shown in Fig.Calc-3.18:

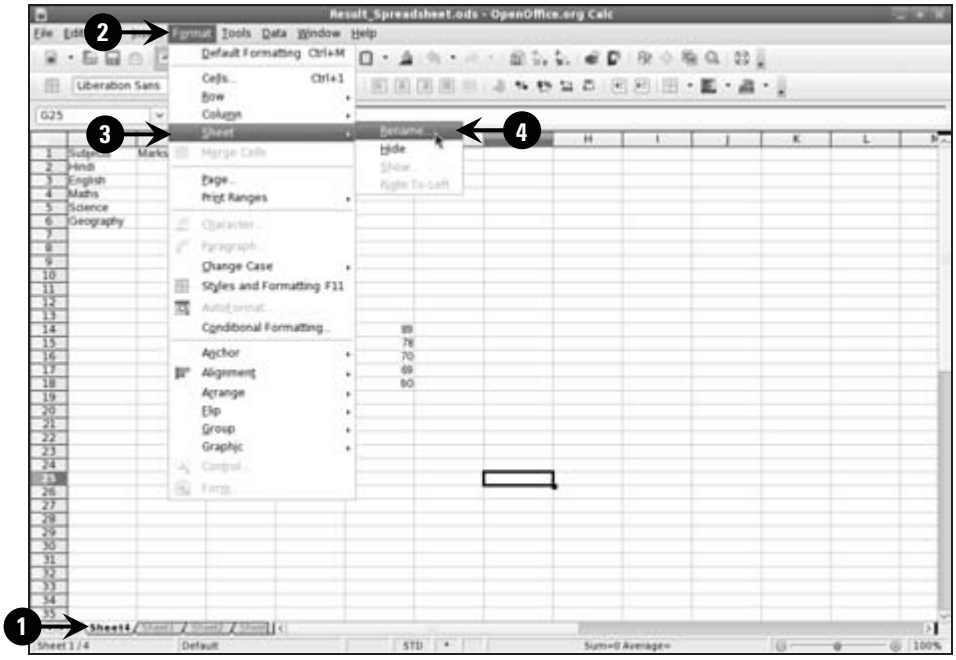


Fig.Calc-3.18

The **Rename Sheet** dialog box appears as shown in (Fig.Calc-3.19).

5. *Delete* the existing sheet name and *type* the new name in the **Name** text box. In our case, we have typed **Management** (Fig.Calc-3.19).
6. *Click* the **OK** button, as shown in Fig.Calc-3.19:

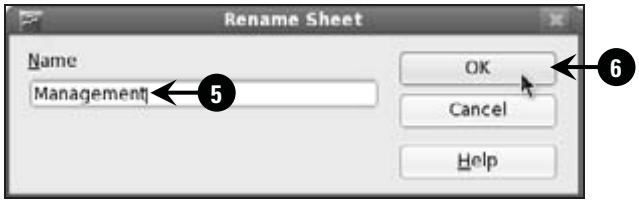


Fig.Calc-3.19

Sheet4 is renamed to Management, as shown in Fig.Calc-3.20:

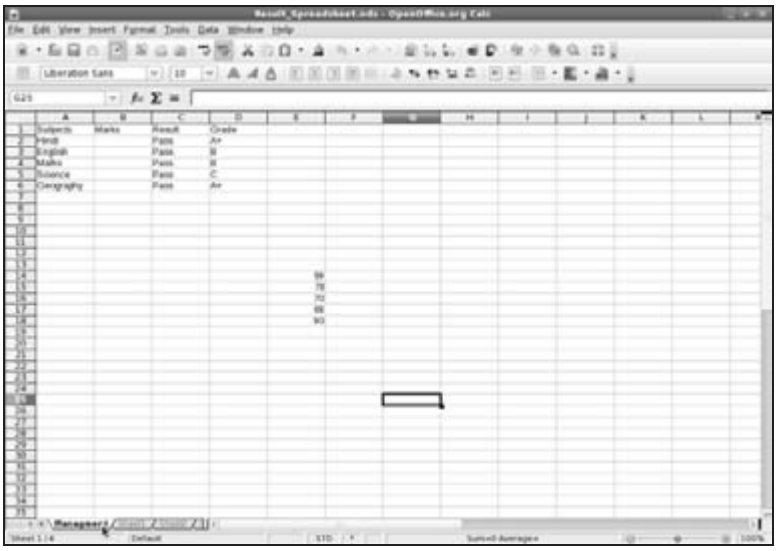


Fig.Calc-3.20

After learning how to rename a spreadsheet, let's now learn how to delete a spreadsheet.

Deleting a Spreadsheet

You can delete a spreadsheet in the OpenOffice.org Calc application when it is not required.

Let's perform the following steps to delete a spreadsheet:

1. *Select* a sheet that you want to delete from the Sheet tab. In our case, we have selected **Management** (Fig.Calc-3.21).
2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.21).
3. *Select* the **Sheet** option. A sub menu appears (Fig.Calc-3.21).
4. *Select* the **Delete** option, as shown in Fig.Calc-3.21:

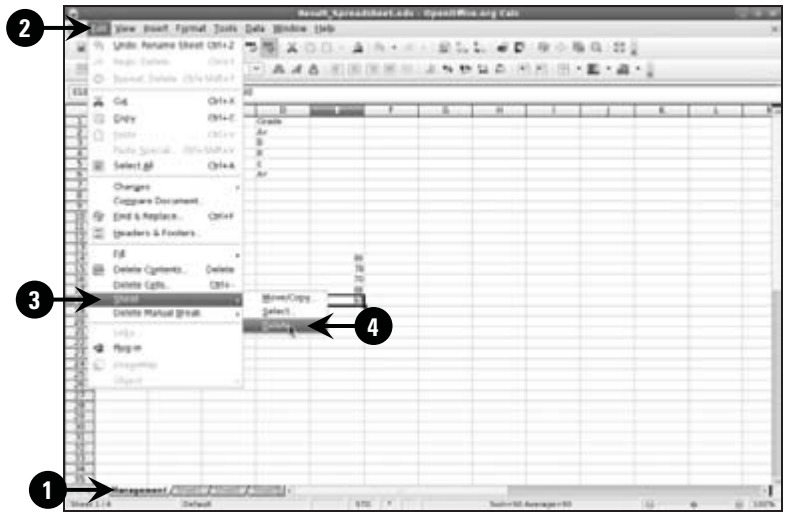


Fig.Calc-3.21

The Management sheet is deleted, as shown in Fig.Calc-3.22:

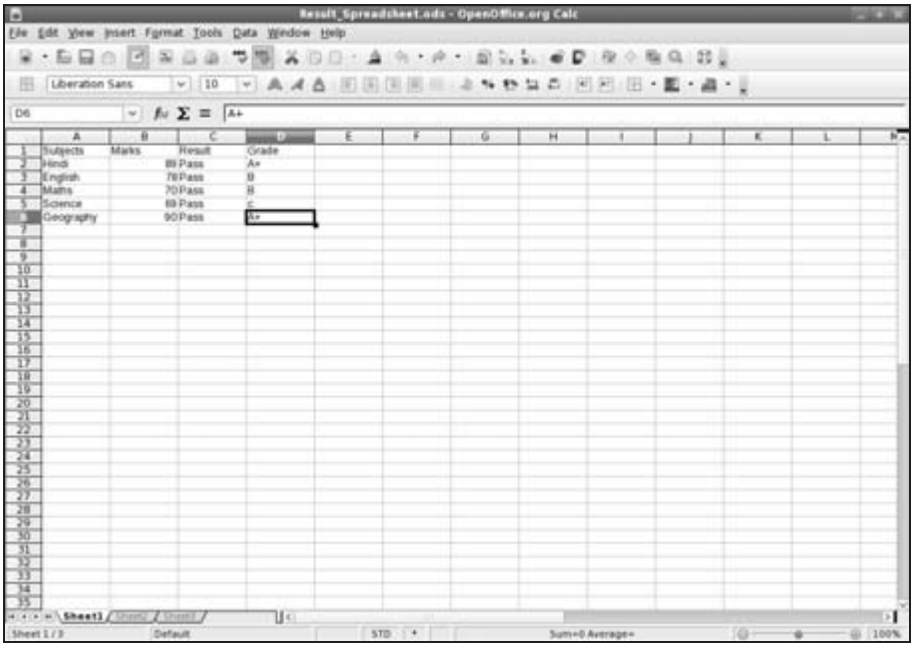


Fig.Calc-3.22

After learning to delete a spreadsheet, let's now learn to work with rows and columns in a spreadsheet.

Working with Rows and Columns

As discussed, a spreadsheet consists of rows and columns. By default, there are 65536 rows and 1024 columns in a spreadsheet. You can insert more rows and columns in your spreadsheet as per your requirement. If you do not require any row or column, you can delete it.

In this section, you learn to perform the following tasks:

- Insert a row
- Insert a column
- Delete a row
- Delete a column
- Deleting the content of a row
- Deleting the content of a column

Let's begin with inserting a row.

Inserting a Row

If you want to add the data between the rows, then you can insert the additional rows in the spreadsheet. Before inserting a row, you need to select the row above which you want to insert the new row.

Let's perform the following steps to insert a row:

1. Select any row in the spreadsheet. In our case, we have selected 2nd row, as shown in Fig.Calc-3.23:

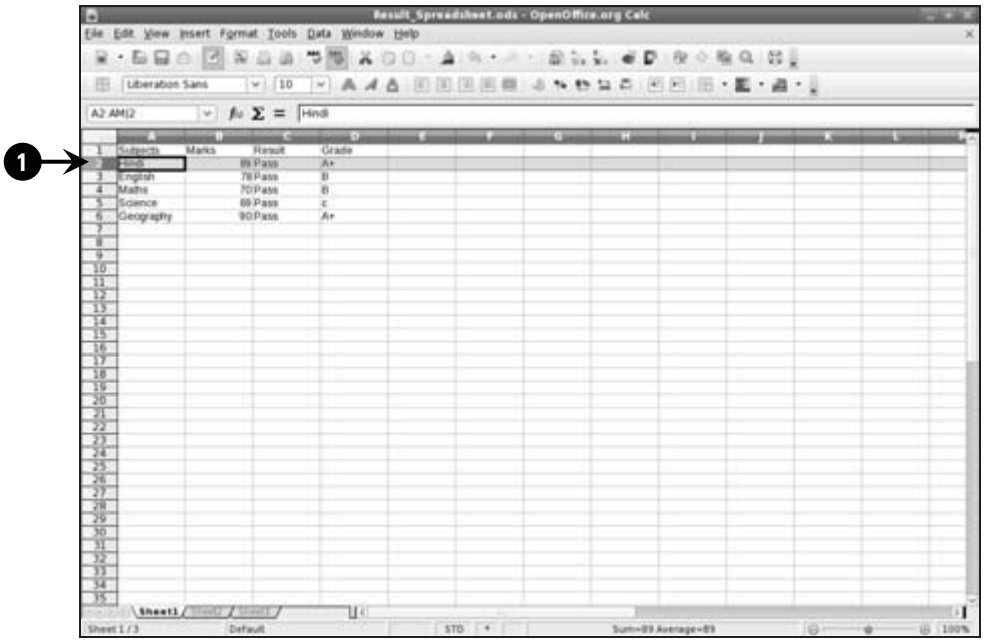


Fig.Calc-3.23

2. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.24).
3. *Select* the **Rows** option, as shown in Fig.Calc-3.24:

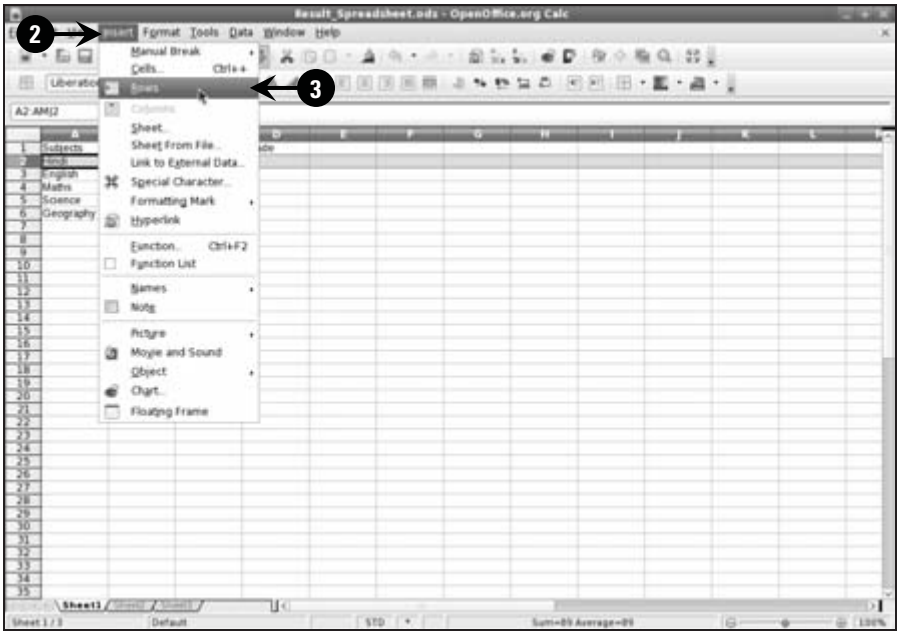


Fig.Calc-3.24

The new row is inserted above the selected row, as shown in Fig.Calc-3.25:

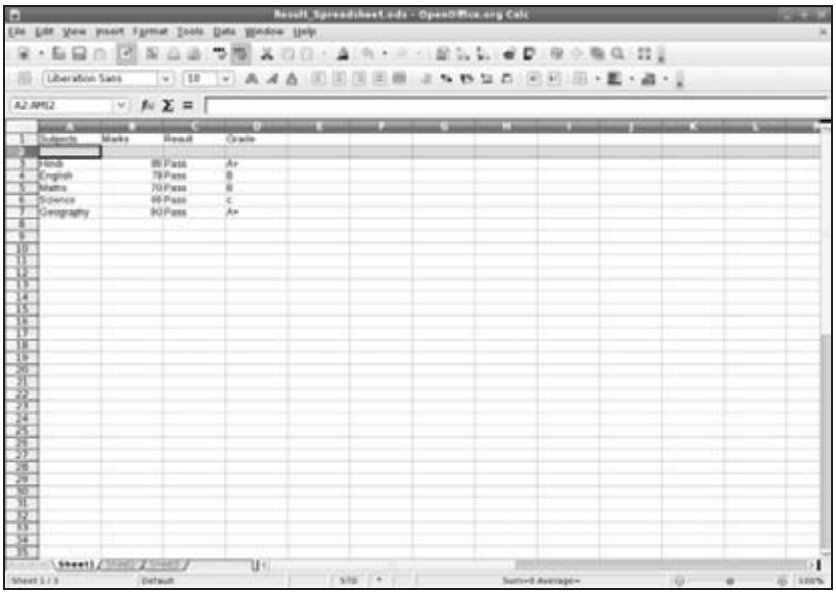


Fig.Calc-3.25

Let's now learn how to insert a column.

Inserting a Column

Similar to rows, you can also insert columns in a spreadsheet. When you insert a new column, the existing column shifts to the right side, by default. You can insert columns only to the left side of the active cells.

Let's perform the following steps to insert a column in a spreadsheet:

1. *Select* any column before which you want to insert a new column in the spreadsheet. In our case, we have selected the **B** column, as shown in Fig.Calc-3.26:

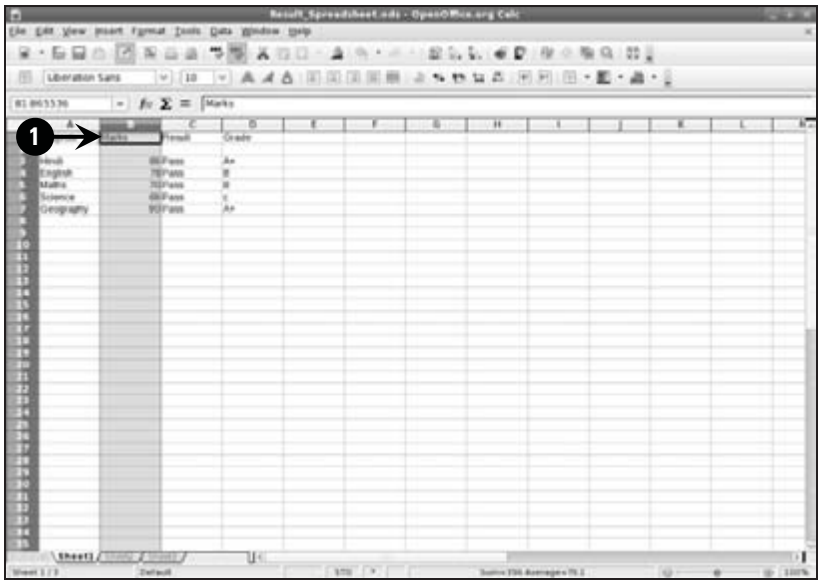


Fig.Calc-3.26

2. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.27).
3. *Select* the **Columns** option, as shown in Fig.Calc-3.27:

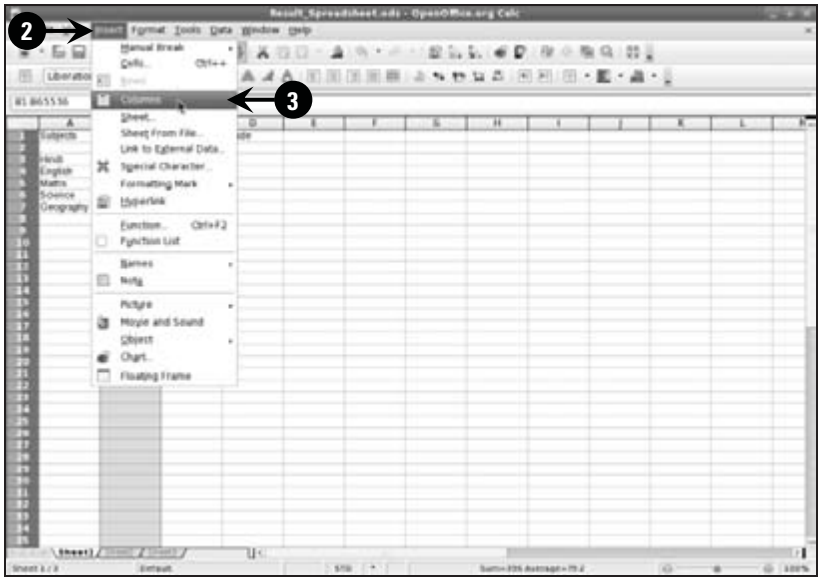


Fig.Calc-3.27

A new column is inserted on the left side of column B, as shown in Fig.Calc-3.28:

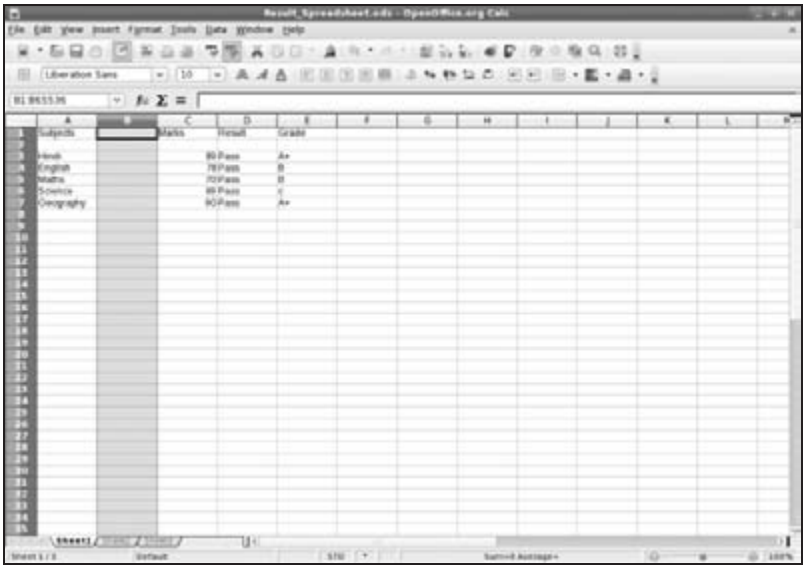


Fig.Calc-3.28

Let's now learn how to delete a row.

Deleting a Row

If you do not require a row, then you can delete it from a spreadsheet. Perform the following steps to delete a row from a spreadsheet:

1. *Select* any row that you want to delete. In our case, we have selected **2nd** row, as shown in Fig.Calc-3.29:

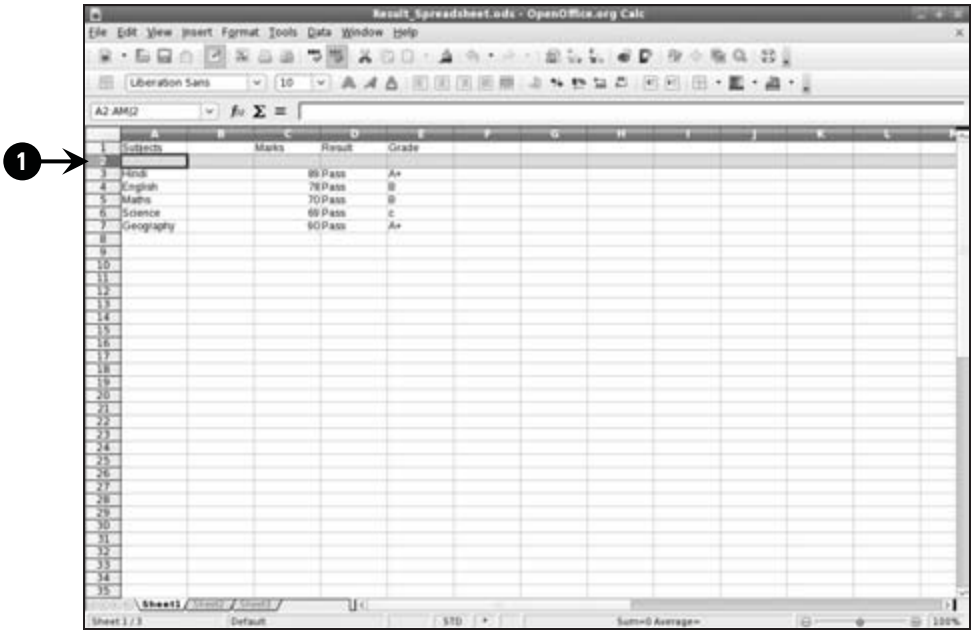


Fig.Calc-3.29

2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.30).
3. *Select* the **Delete Cells** option, as shown in Fig.Calc-3.30:

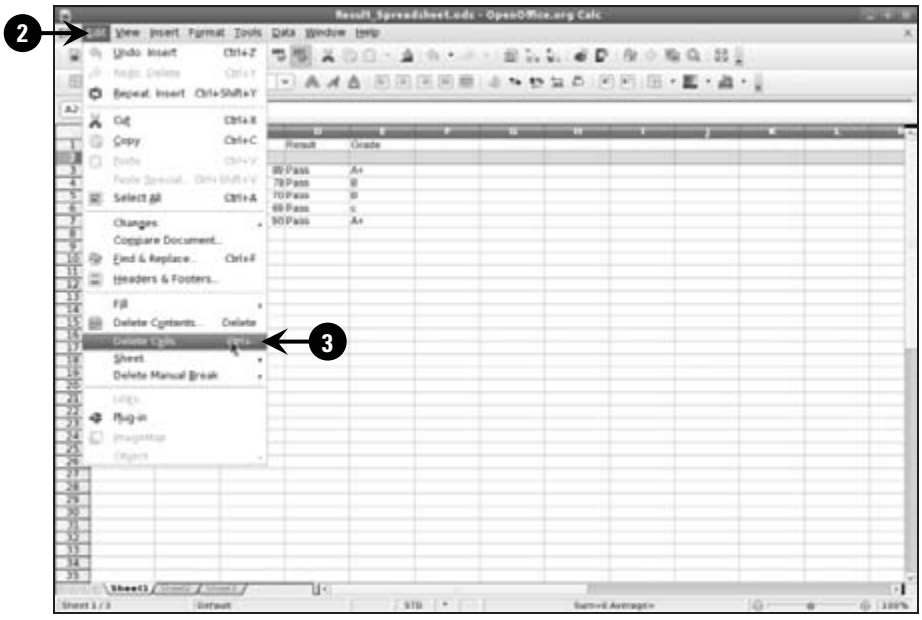


Fig.Calc-3.30

The **Delete Cells** dialog box appears (Fig.Calc-3.31).

4. *Select* the required radio button under the **Selection** category. By default, **Shift cells up** is selected. In our case, we have selected the **Delete entire row(s)** radio button (Fig.Calc-3.31).
5. *Click* the **OK** button, as shown in Fig.Calc-3.31:

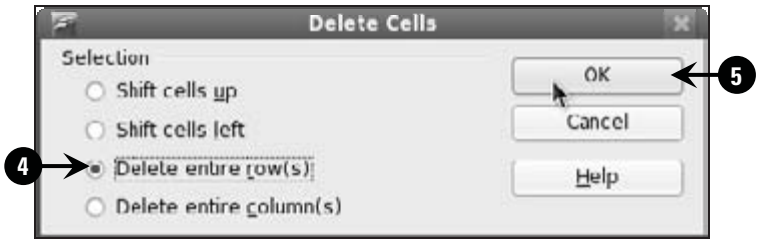


Fig.Calc-3.31

The selected row is deleted from the spreadsheet, as shown in Fig.Calc-3.32:

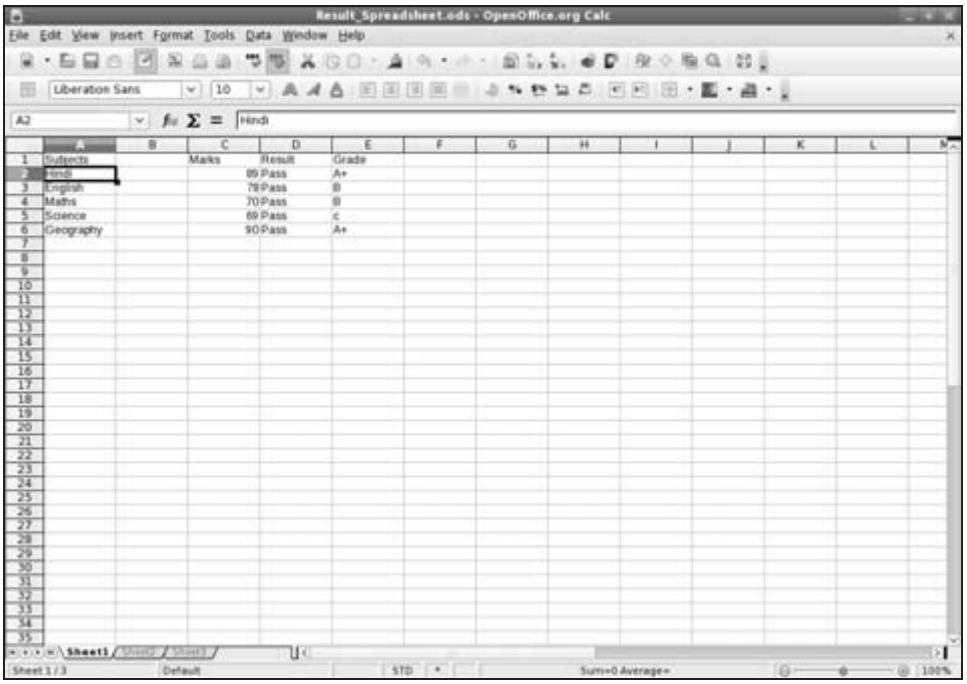


Fig.Calc-3.32

Let's now learn how to delete a column.

Deleting a Column

Similar to deleting a row, you can also delete a column from a spreadsheet, if you do not require it. Perform the following steps to delete a column:

1. *Select* the column that you want to delete. In our case, we have selected the **B** Column, as shown in Fig.calc-3.33:

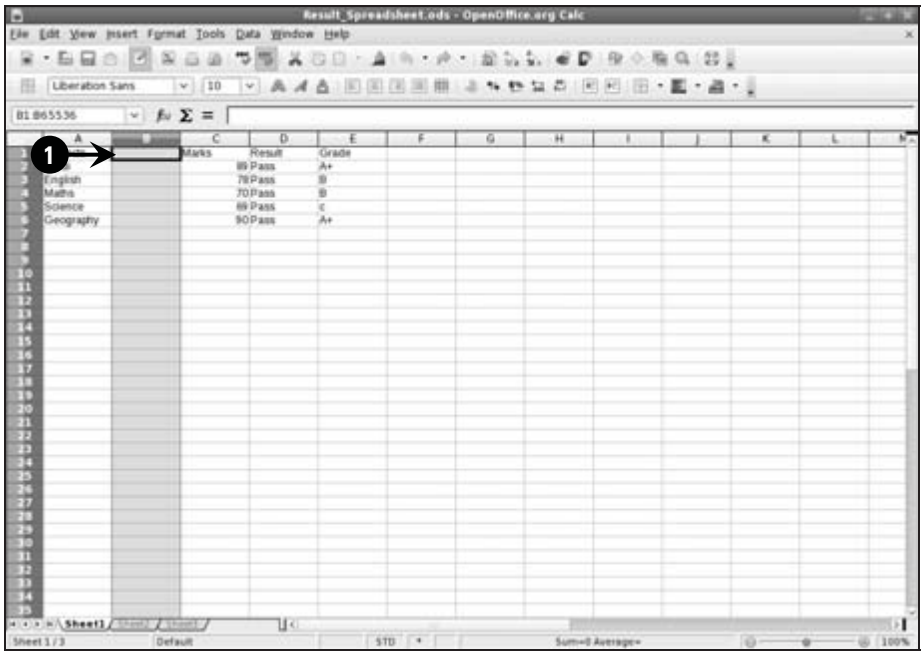


Fig.Calc-3.33

2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.34).
3. *Select* the **Delete** Cells option from the drop-down menu, as shown in Fig.Calc-3.34:

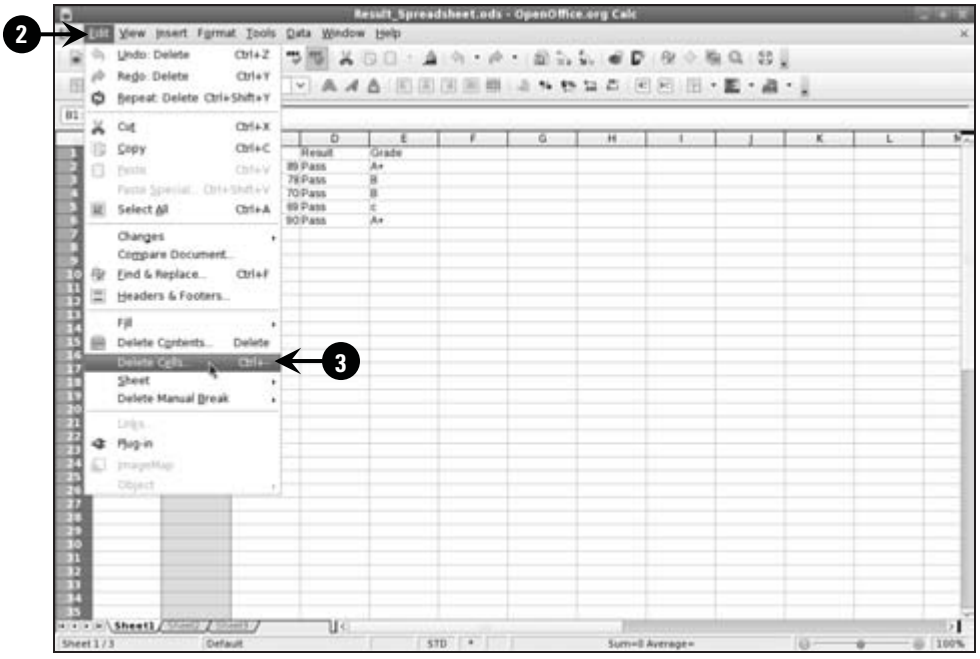


Fig.Calc-3.34

The **Delete Cells** dialog box appears (Fig.Calc-3.35).

4. *Select* the **Delete entire column(s)** radio button under the **Selection** category (Fig.Calc-3.35).
5. *Click* the **OK** button, as shown in Fig.Calc-3.35:

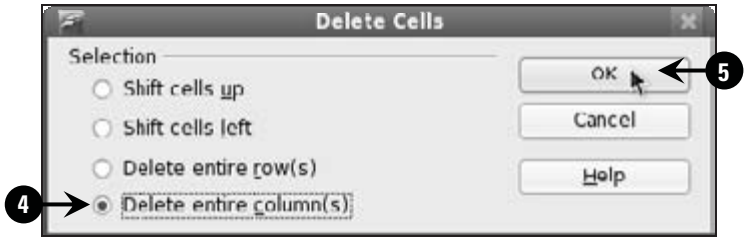


Fig.Calc-3.35

The selected column is deleted from the spreadsheet, as shown in Fig.Calc-3.36:

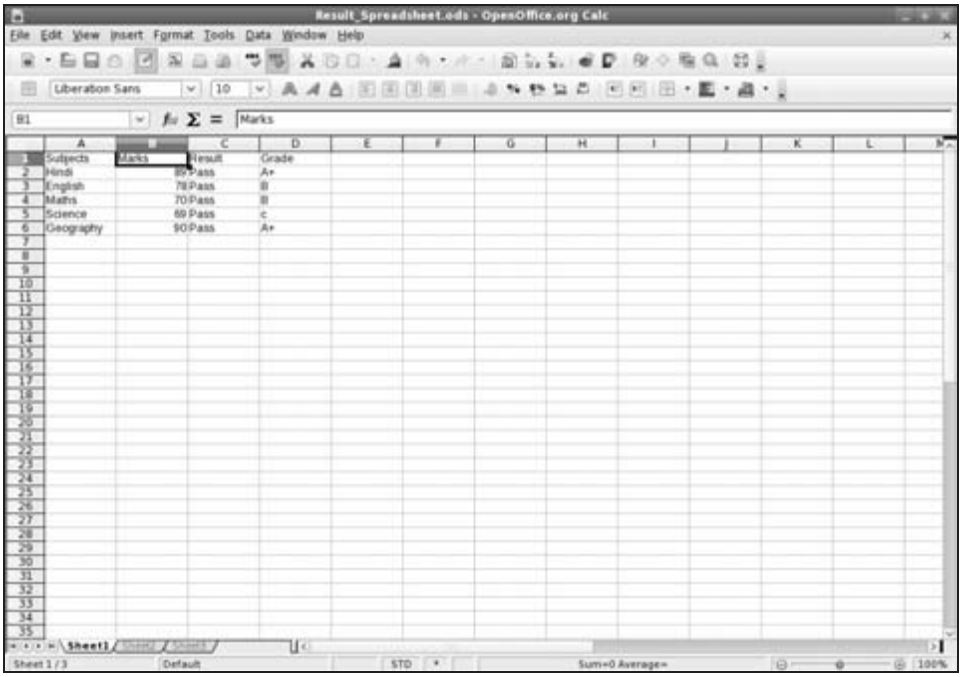


Fig.Calc-3.36

After deleting the column, let's now learn to delete the content of a row.

Deleting the Content of a Row

There are situations when you do not require the content present in the spreadsheet. Perform the following steps to delete the content of a row:

1. *Select* the content that you want to delete, as shown in Fig.Calc-3.37:

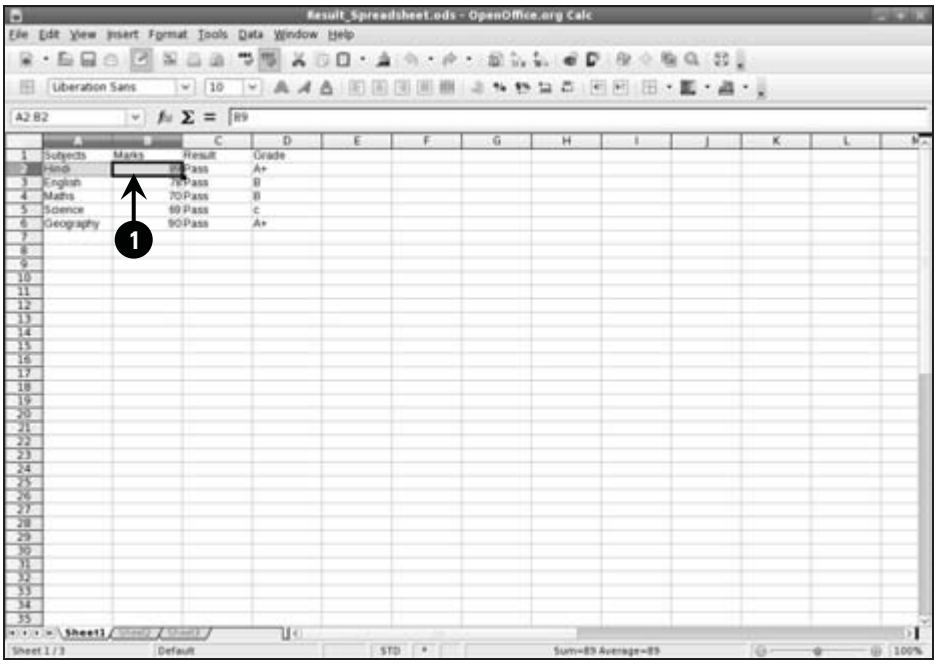


Fig.Calc-3.37

2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.38).
3. *Select* the **Delete Contents** option, as shown in Fig.Calc-3.38:

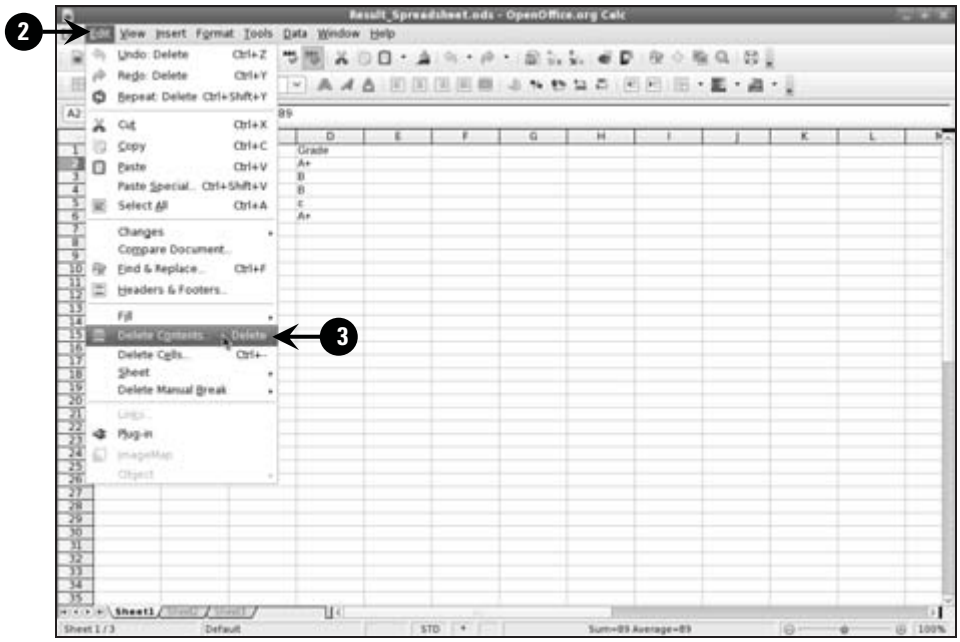


Fig.Calc-3.38

The **Delete Contents** dialog box appears (Fig.Calc-3.39).

4. *Select* the **Delete all** check box under the **Selection** group (Fig.Calc-3.39).
5. *Click* the **OK** button, as shown in Fig.Calc-3.39:



Fig.Calc-3.39

The selected content of the 2nd row has been deleted, as shown in Fig.Calc-3.40:

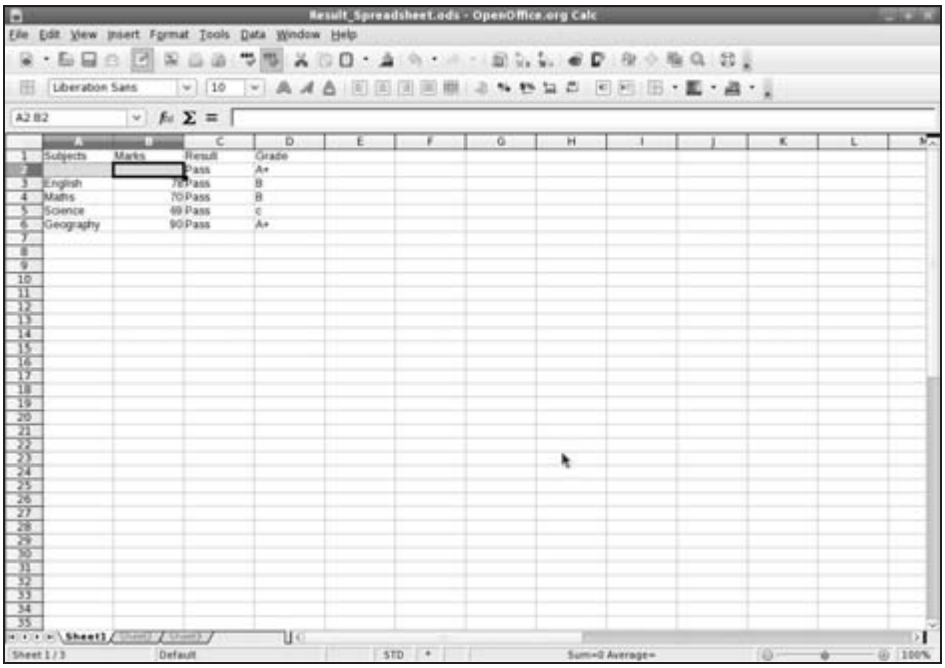


Fig.Calc-3.40

Let's now learn to delete the content of a column.

Deleting the content of a Column

Similar to deleting the content of a row, you can delete the content of a column. Perform the following steps to delete the content of a column:

1. *Select* the content that you want to delete from a column. In our case, we have selected the content from column **C**, as shown in Fig.Calc-3.41:

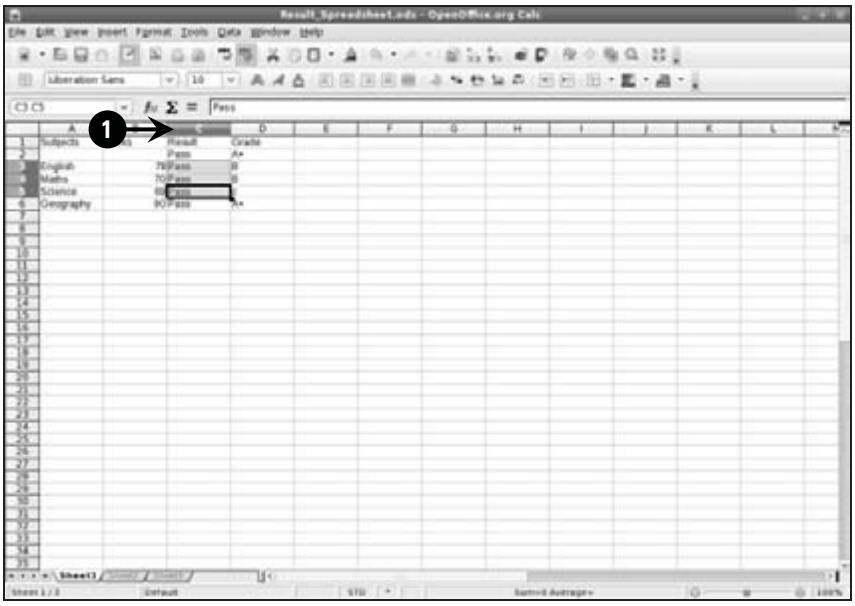


Fig.Calc-3.41

2. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.42).
3. *Select* the **Delete Contents** option from the drop-down menu, as shown in Fig.Calc-3.42:

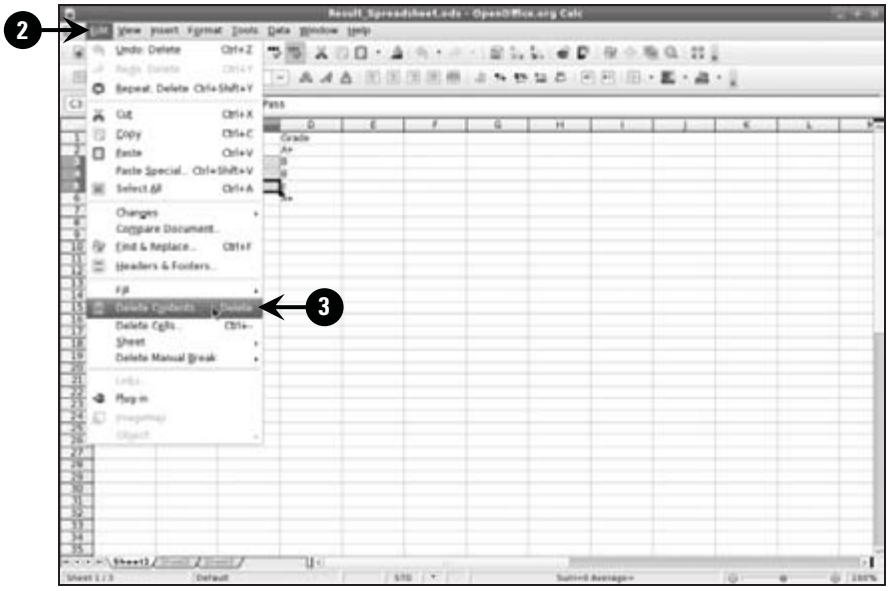


Fig.Calc-3.42

The **Delete Contents** dialog box appears (Fig.Calc-3.43).

4. *Select* the required check box under the **Selection** group. In our case, we have *selected* **Text**, **Numbers**, **Date & Time**, **Formulas**, and **Notes** cheek boxes, respectively (Fig.Calc-3.43).
5. *Click* the **OK** button, as shown in Fig.Calc-3.43:



Fig.Calc-3.43

The selected content of the C column has been deleted, as shown in Fig.Calc-3.44:

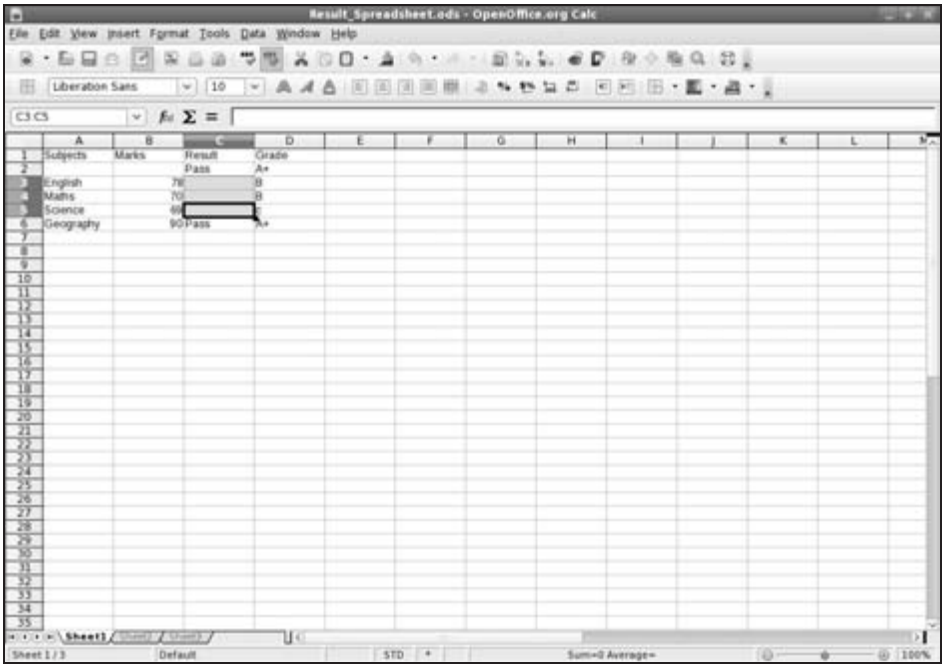


Fig.Calc-3.44

After learning about how to work with rows and columns, let's now learn how to undo an action.

Undoing an Action

Sometimes, after performing an action, you realize that the particular action is not required. You can revert back the last performed action in such cases. For example, after deleting some content, you find that the content you have deleted is important and required. You can retrieve this deleted content by selecting the Undo option from the Edit menu. Similarly, you can delete the newly inserted content. The task of retrieving the deleted content or deleting the newly inserted content by using the Edit menu is known as undoing an action. Let's undo an action by performing the following steps to retrieve the content of a column that you have deleted in the preceding section:

1. *Select* the **Edit** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.45).
2. *Select* the **Undo: Delete** option, as shown in Fig.Calc-3.45:

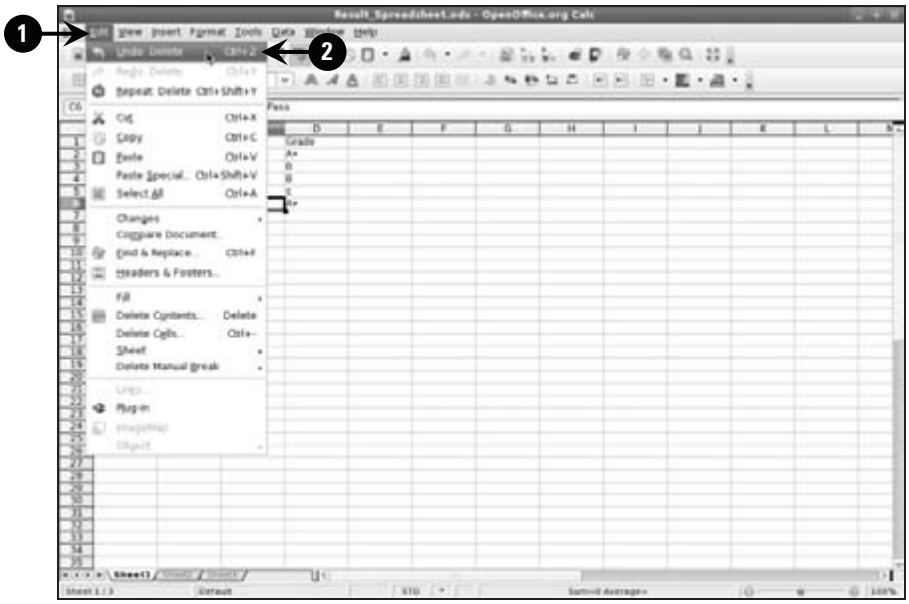


Fig.Calc-3.45

The deleted content of a column reappears, as shown in Fig.Calc-3.46:

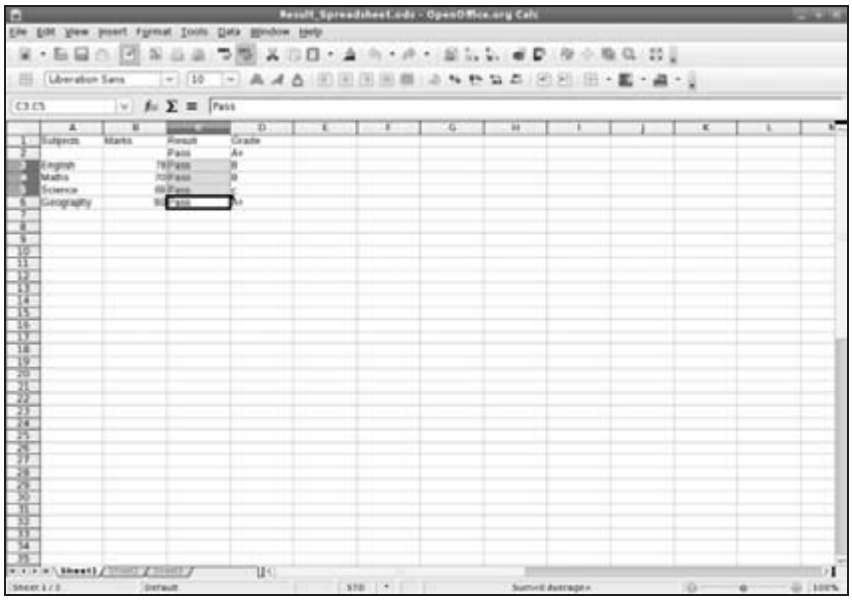


Fig.Calc-3.46

After learning how to undo an action, let's now learn to insert a series in a spreadsheet.

Inserting a Series

Sometimes, you need to fill the range of cells with a sequence of numbers or some other kind of series. For example, suppose you have to enter the numbers from 1 to 100 in a continuous manner, then it would become difficult and time consuming to enter numbers in a cell manually. In such situations, the

fill series option available in OpenOffice.org Calc can be are used to fill a cell range with a series of entries.

Let's perform the following steps to insert a series:

1. *Select* the required sheet. In our case, we have selected **Sheet2**, as shown in Fig. Calc-3.47:

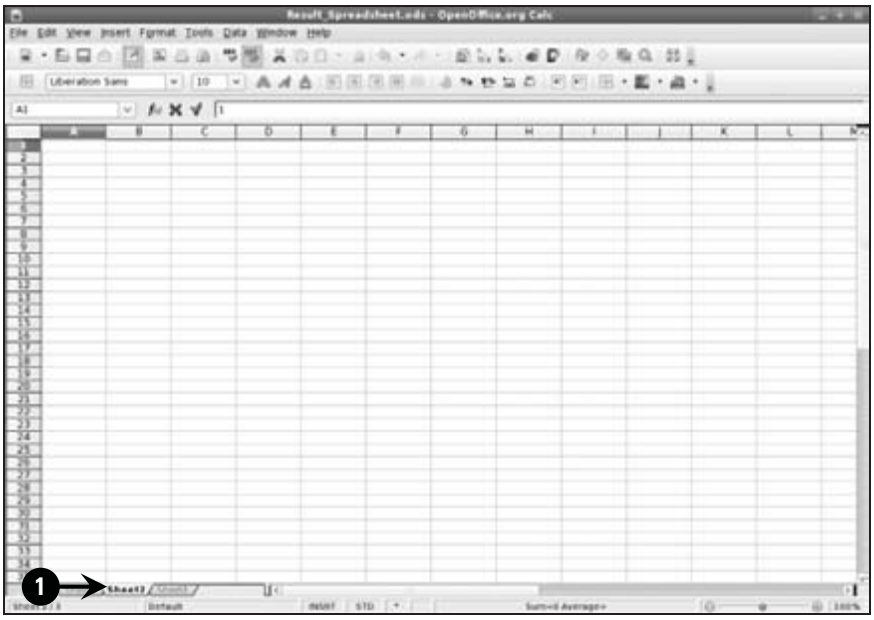


Fig.Calc-3.47

2. *Type* **1** in the **A1** cell, as shown in Fig.Calc-3.48:

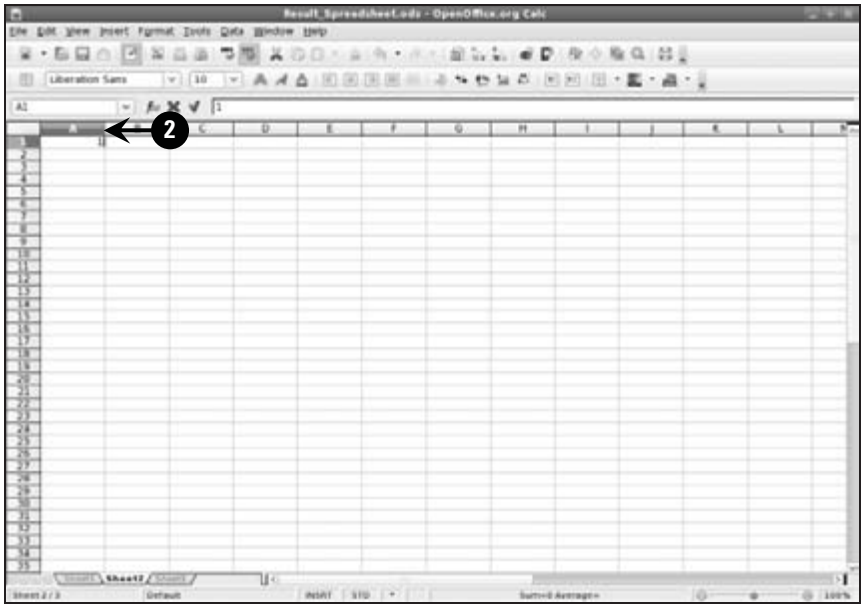


Fig.Calc-3.48

3. *Select* the range from **A1 to A10**, to fill the series with the linear numbers, as shown in Fig.Calc-3.49:

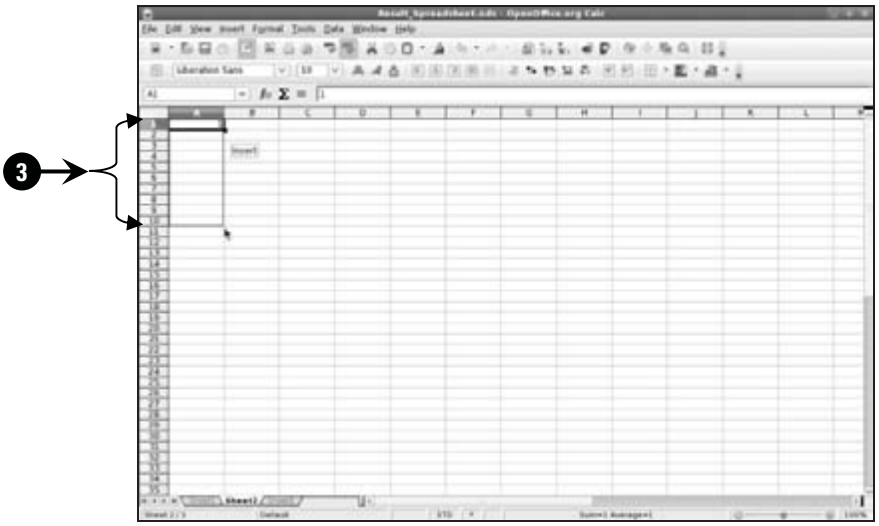


Fig.Calc-3.49

The **Fill Series** dialog box appears, as shown in (Fig.Calc-3.50).

4. *Select* the **Linear** radio button under the **Series type** category (Fig.Calc-3.50).
5. *Type* **1** in the **Start value** and **Increment** text boxes, respectively (Fig.Calc-3.50).
6. *Click* the **OK** button, as shown in Fig.Calc-3.50:

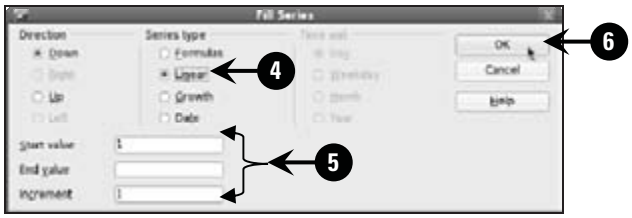


Fig.Calc-3.50

The series is inserted in **Sheet2,** as shown in Fig.Calc-3.51:

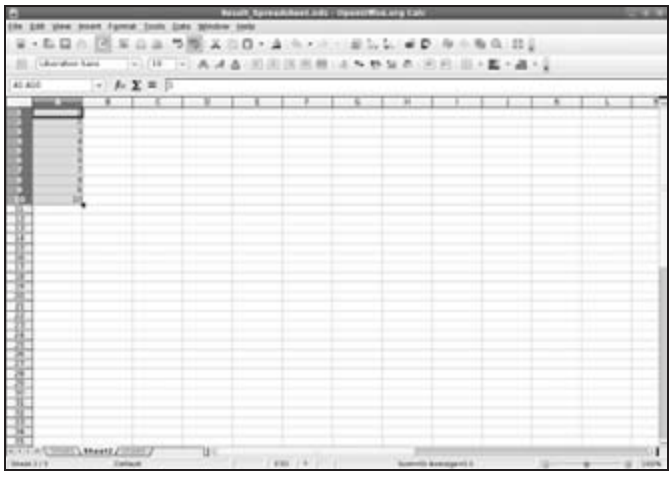


Fig.Calc-3.51

After learning to insert a series, let's now learn to change the width of a column.

Changing the Column Width

In the OpenOffice.org Calc application, each cell can have 9 or 10 characters. However, you can change the width of a column as per your requirement. This lets you manage the layout of your spreadsheet more efficiently.

Let's perform the following steps to change the column width:

1. *Select* the required sheet. In our case, we have selected **Sheet1** (Fig.Calc-3.52).
2. *Select* the column whose width you want to change. In our case, we have selected the **D** column, as shown in Fig.Calc-3.52:

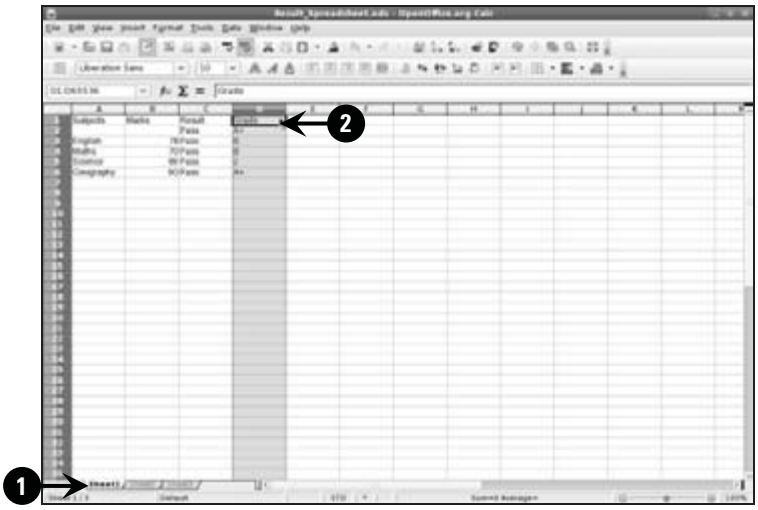


Fig.Calc-3.52

3. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.53).
4. *Select* the **Column** option from the drop-down menu. A sub menu appears (Fig.Calc-3.53).
5. *Select* the **Width** option from the sub menu, as shown in Fig.Calc-3.53:

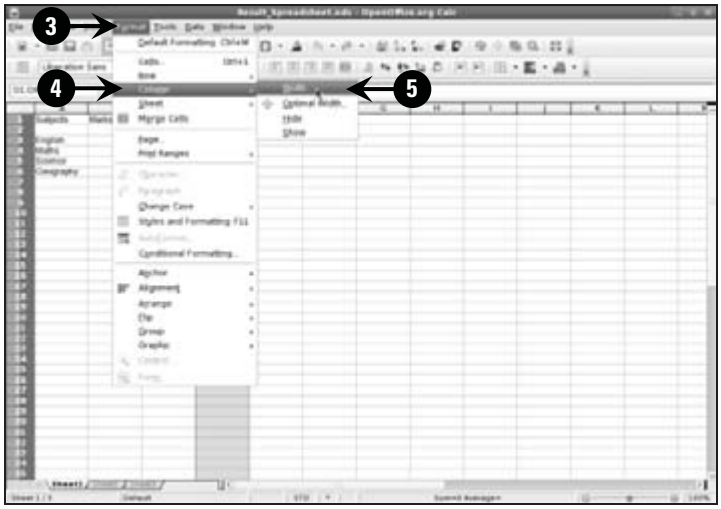


Fig.Calc-3.53

The **Column Width** dialog box appears (Fig.Calc-3.54).

6. *Click* the up or down arrow beside the **Width** option to set the width of the column. In our case, we have clicked the up arrow button and set the width to 1.39 (Fig.Calc-3.54).
7. *Click* the **OK** button, as shown in Fig.Calc-3.54:

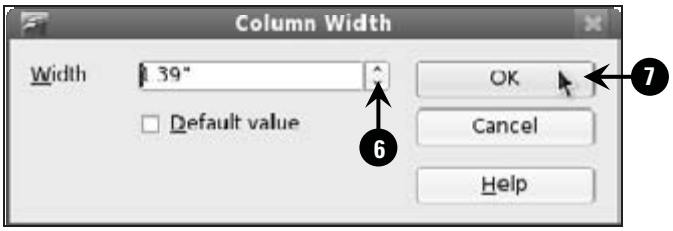


Fig.Calc-3.54

The width of the column has been increased, as shown in Fig.Calc-3.55:

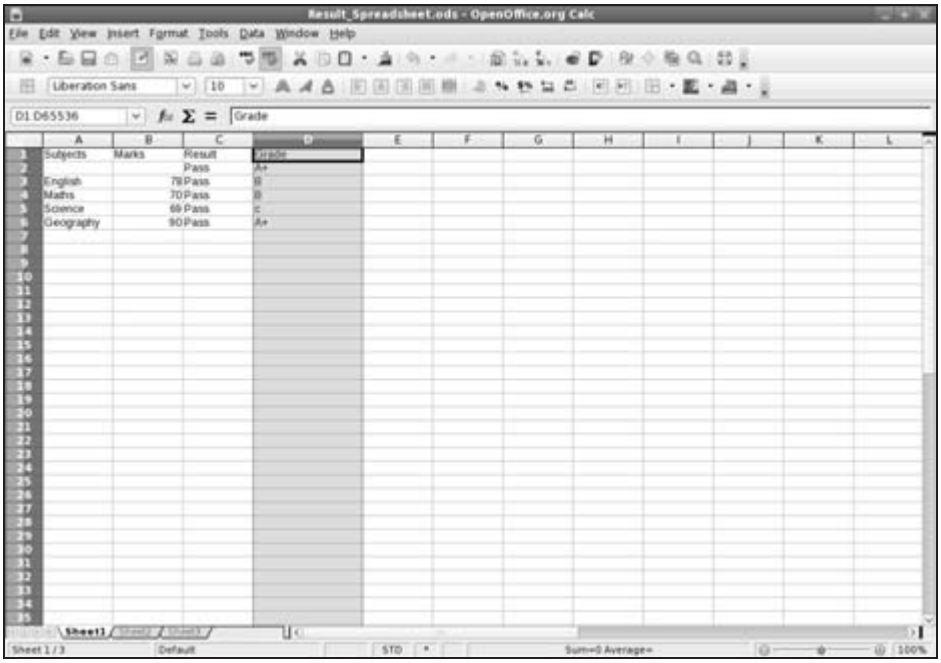


Fig.Calc-3.55

After learning how to change the width of a column, let's now learn how to hide a column.

Hiding a Column

Sometimes, you need to display or print only some columns of a sheet and do not want to delete the other column as they may contain information that may be needed later. You can display the required column by hiding the other columns using the Hide option.

Let's perform the following steps to hide a column:

1. *Select* the column that you want to hide. In our case, we have selected the D column (Fig.Calc-3.56).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.56).
3. *Select* the **Column** option from the drop-down menu. A sub menu appears (Fig.Calc-3.56).
4. *Select* the **Hide** option from the sub menu, as shown in Fig.Calc-3.56:

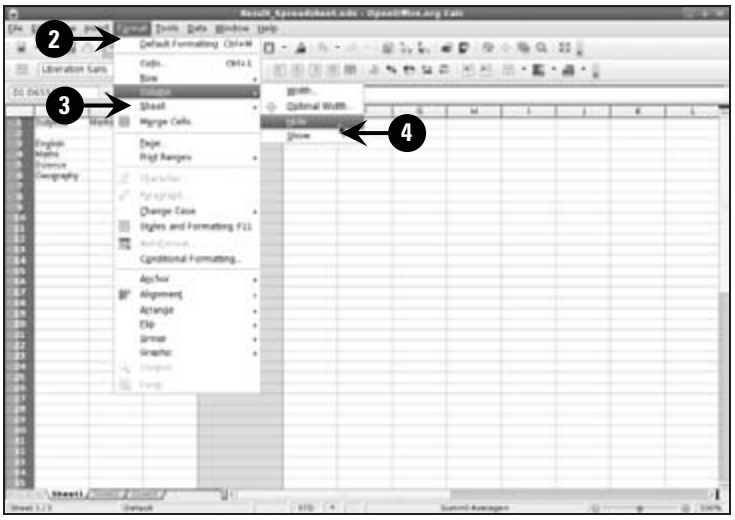


Fig.Calc-3.56

The **D** column gets has been hidden, as shown in Fig.Calc-3.57:

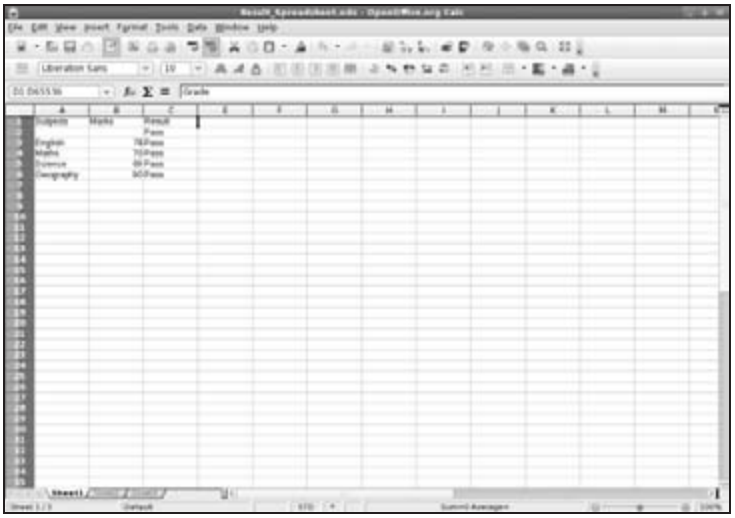


Fig.Calc-3.57

After learning to hide a column, let's now learn to change the row height.

Changing the Row Height

In OpenOffice.org Calc, the default height of a row is 0.17". However, you can change the height of a row as per your requirement. It is not mandatory that all the rows of a spreadsheet must have the same height; therefore, you can apply different heights to different rows. It is important to note that when you change the height of a row, the height of all the cells of the row also changes; however, you cannot apply different heights to cells of the row, that is, all cells in a row have the same height.

Let's perform the following steps to change the height of row:

1. *Select* the row whose height you want to change. In our case, we have selected the **2nd** row in Sheet1, as shown Fig.Calc-3.58:

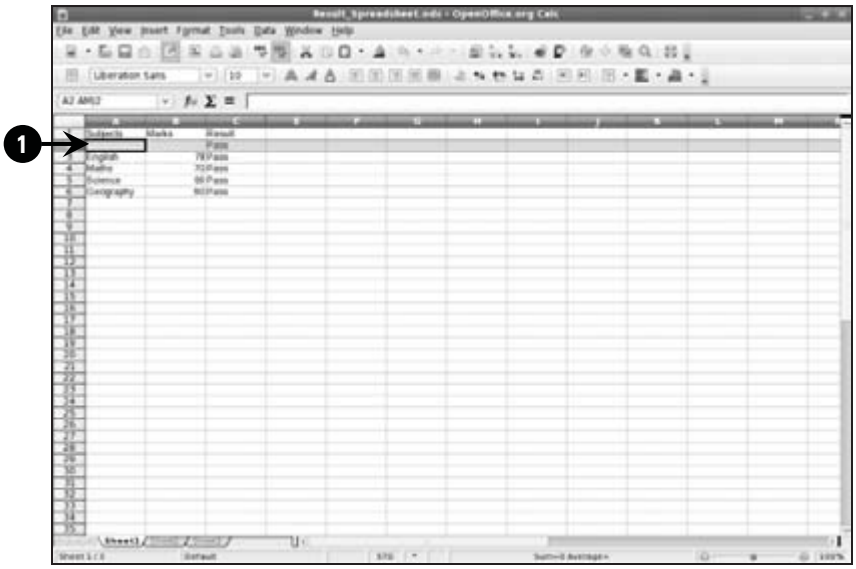


Fig.Calc-3.58

2. *Select* the **Format** menu in the menu bar. A drop-down menu appears (Fig.Calc-3.59).
3. *Select* the **Row** option from the drop-down menu. A sub menu appears (Fig.Calc-3.59).
4. *Select* the **Height** option from the sub menu, as shown in Fig.Calc-3.59:

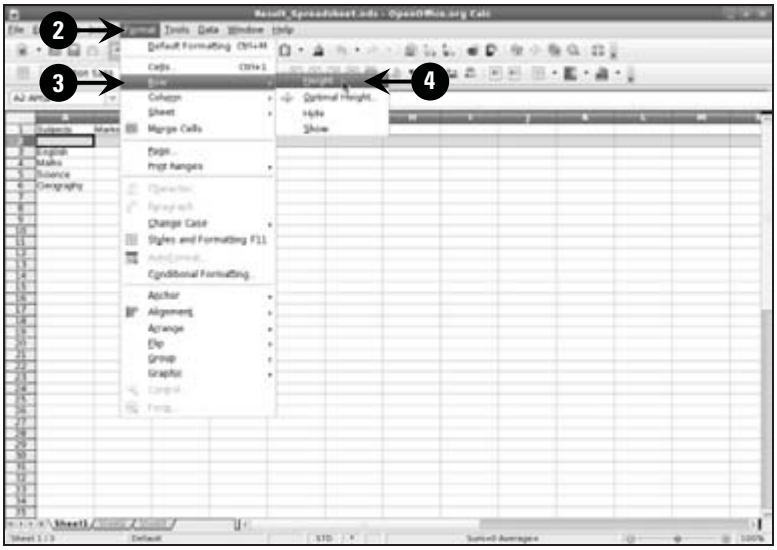


Fig.Calc-3.59

The **Row Height** dialog box appears (Fig.Calc-3.60).

5. *Click* the up or down arrow of the Height spin box to increase or decrease the height of the row. In our case, we set the height of row as **1.48** (Fig.Calc-3.60).
6. *Click* the **OK** button, as shown in Fig. Calc-3.60:

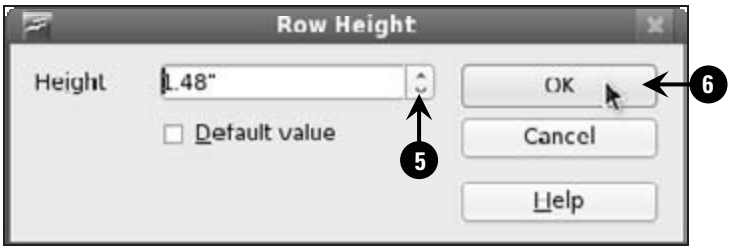


Fig.Calc-3.60

The height of the row has been increased, as shown in Fig.Calc-3.61:

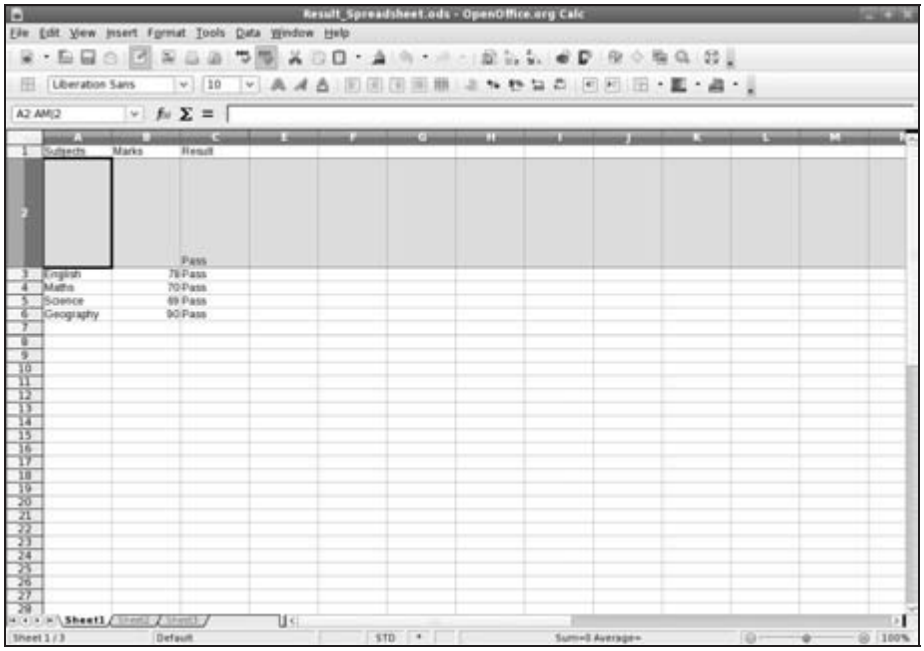


Fig.Calc-3.61

After learning about changing the height of the row, let's now learn to align the data.

Aligning the Data

In a Calc spreadsheet, you can change the horizontal and vertical alignment of the data of a cell. In a cell, the text is left-aligned by default, and values and dates are right-aligned. You can manually change the horizontal alignment of text and values by using the alignment tools provided by the object toolbar. The alignment tools provided by the object toolbar are as follows:

- **Align Left:** Aligns the data to the left side of the cell
- **Align Centered:** Aligns the data to the center of the cell
- **Align Right:** Aligns the data to the right side of the cell
- **Justified:** Aligns the data evenly to both the left and right sides of the cell

Let's perform the following steps to align the data:

1. S*elect* the cell whose alignment you want to change. In our case, we have selected all the cell of **3rd row,** as shown in Fig.Calc-3.62:

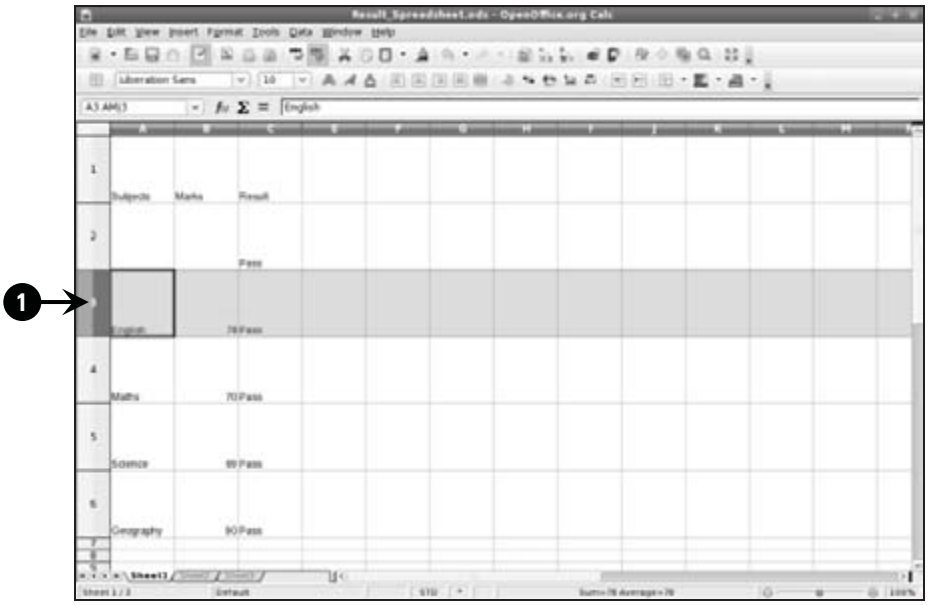


Fig.Calc-3.62

2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.63).
3. *Select* the **Alignment** option form the drop-down menu. A sub menu appears (Fig.Calc-3.63).
4. *Select* the required check box from the sub menu. In our case, we have selected the **Right** check box, as shown in Fig.Calc-3.63:

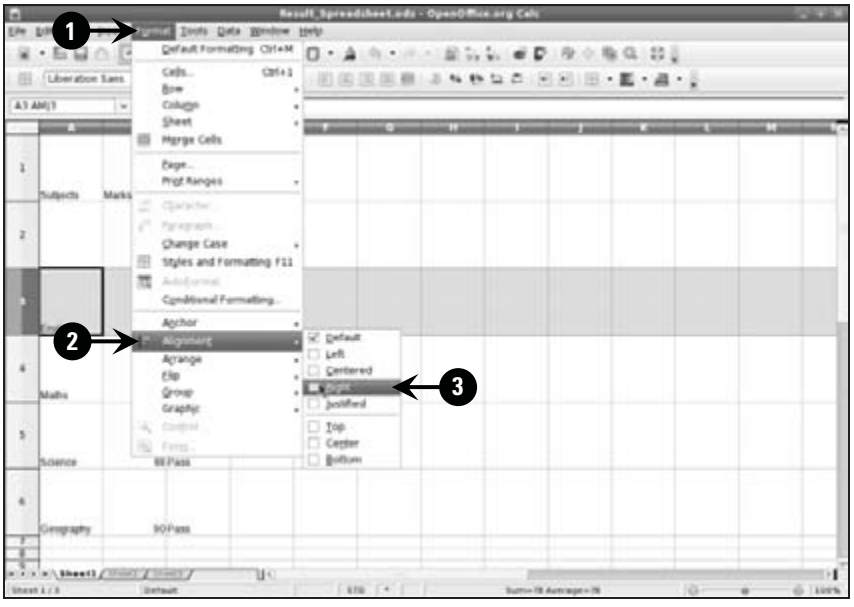


Fig.Calc.3.63

The data of 3rd row has been right aligned, as shown in Fig.Calc-3.64:

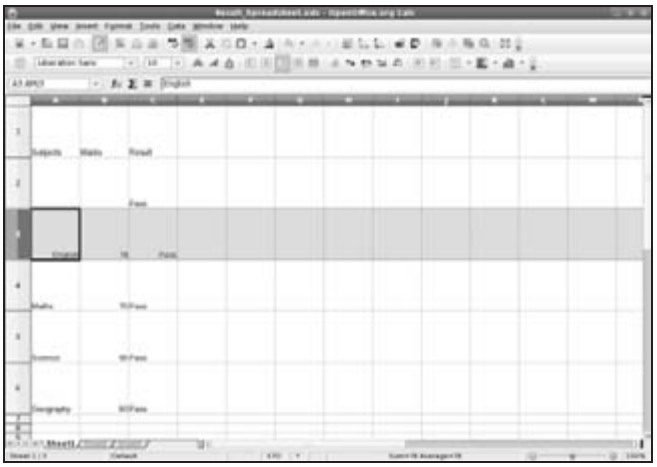


Fig.Calc-3.64

After learning to align the data in the sheet, let's now learn to format the data.

Formatting the Data

In OpenOffice.org Calc, you can format the data in various ways, such as by changing the font, font style, and font size of the text. The formatting makes the text more emphasizing and eye-catching.

Let's start with changing the font of the text.

Changing the Font

Whenever you enter the data (number or character), it appears in the default font style and font size. However, you can change the font to make the data more impressive and easy to read. You can increase the font size of a leading text in a spreadsheet to make it a heading. To change the font of the text, you need to select a cell, row, or column.

Let's perform the following steps to change the font:

1. *Select* the cells that you want to format. In our case, we have selected the **A3** cell (Fig.Calc-3.65).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.65).
3. *Select* the **Cells** option from the drop-down menu, as shown in Fig.Calc-3.65:

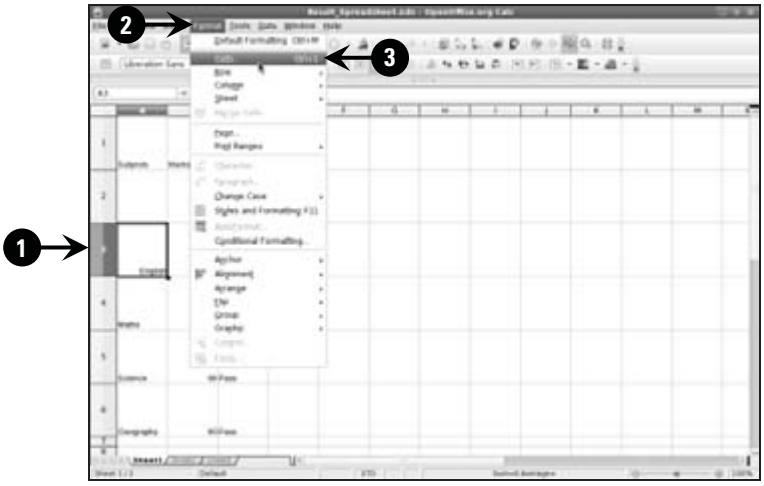


Fig.Calc-3.65

The **Format Cells** dialog box appears (Fig.Calc-3.66)

4. *Select* the **Font** tab from the Format Cells dialog box (Fig.Calc-3.66).
5. *Select* the desired font from the **Font** list box. In our case, we have selected the **Nimbus Sans L** font (Fig.Calc-3.67).
6. *Click* the **OK** button (Fig.Calc-3.67).

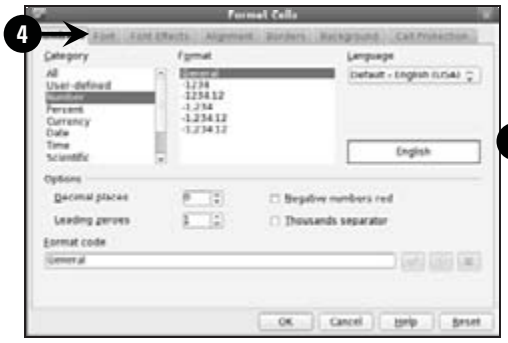


Fig.Calc-3.66

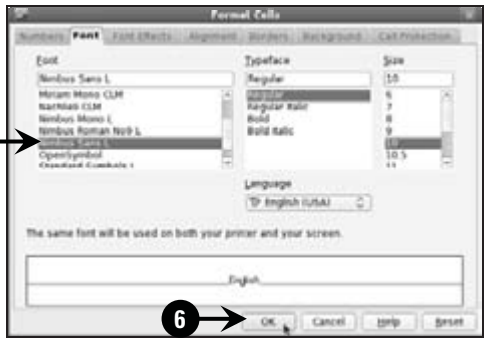


Fig.Calc-3.67

The selected font is applied to the entries of the selected cell, as shown in Fig.Calc-3.68:

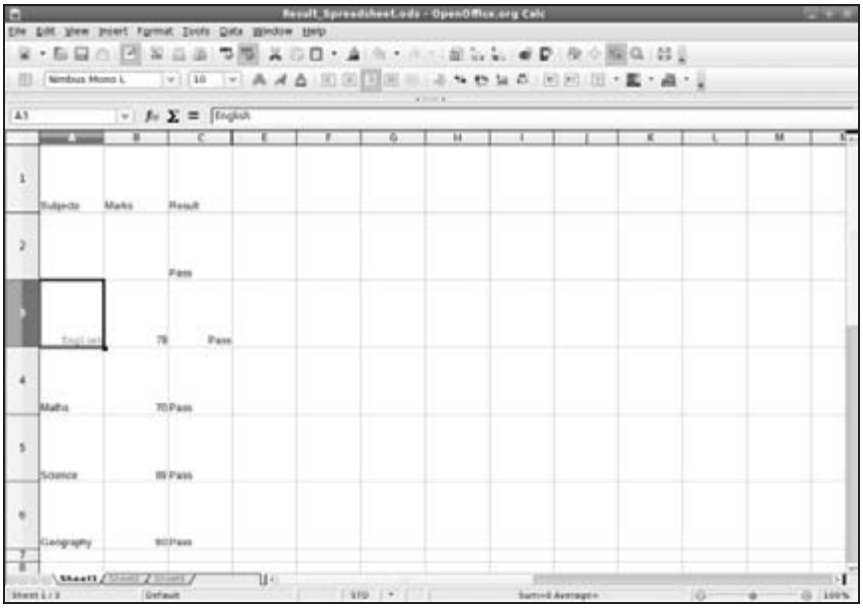


Fig.Calc-3.68

Now, let's learn to change the font size.

Changing the Font Size

You can emphasize the importance of the data by changing its font size. In our case, we are changing the font size of the content selected in the preceding section. Let's perform the following steps to change the font size of the data of the cell:

1. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.69).
2. *Select* the **Cells** option from the drop-down menu, as shown in Fig. Calc-3.69:

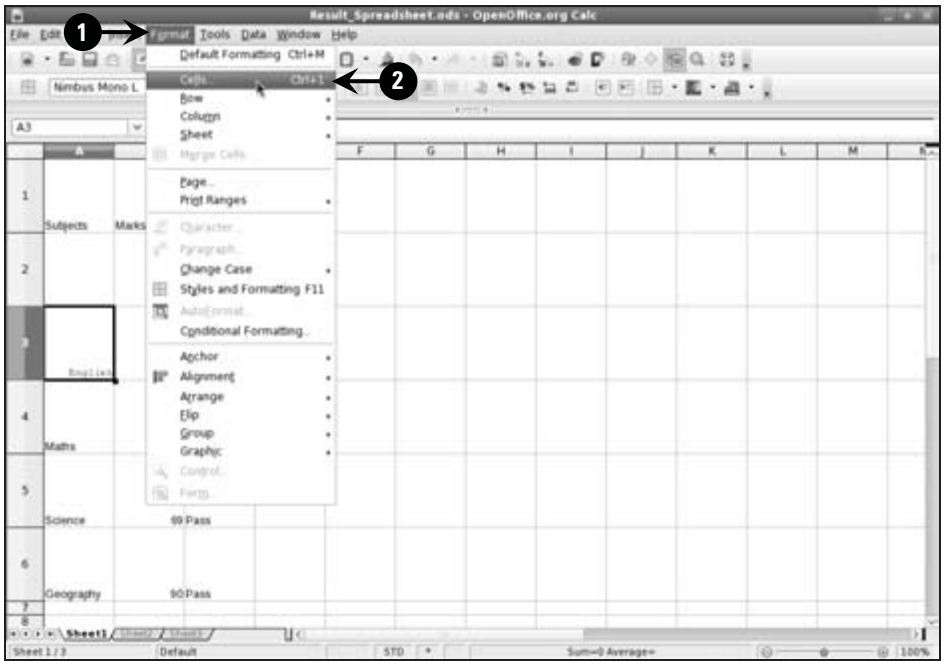


Fig.Calc-3.69

The **Format Cells** dialog box appears (Fig.Calc-3.70).

3. *Select* the font size from the **Size** list box. In our case, we have selected **15** (Fig.Calc-70).
4. *Click* the **OK** button, as shown in Fig.Calc-3.70:

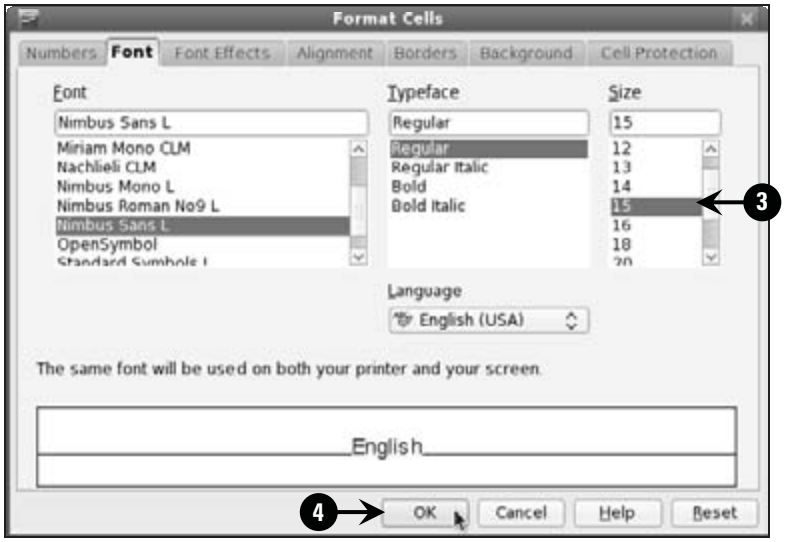


Fig.Calc-3.70

The selected font size is applied to the entries in the cell, as shown in Fig.Calc-3.71:

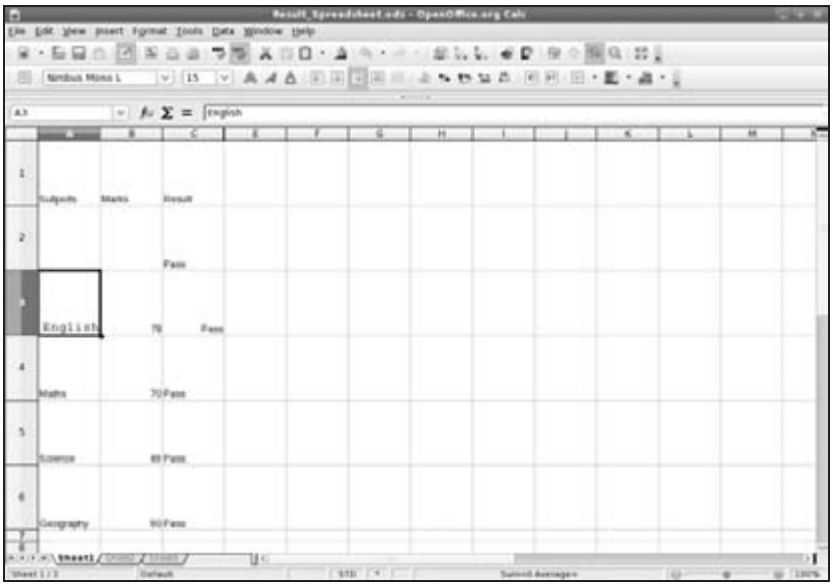


Fig.Calc-3.71

Now, let's learn to change the font style.

Changing the Font Style

OpenOffice.org Calc provides you different styles of font. There are mainly four types of font styles: Regular, Italic, Bold, and Bold Italic. You can change the font style as per your requirement.

Perform the following steps to change the font style of the content of the cell:

1. *Select* the cell whose font style you want to change. In our case, we have selected the **A3** cell (Fig.Calc-3.72).
2. *Select* the **Format** menu in the menu bar. A drop-down menu appears (Fig.Calc-3.72).
3. *Select* the **Cells** option from the drop-down menu, as shown in Fig.Calc-3.72:

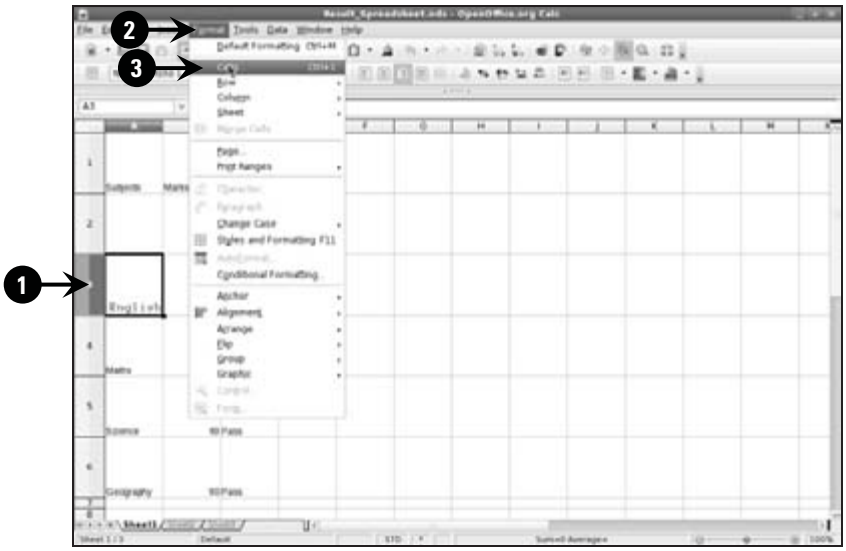


Fig.Calc-3.72

The **Format Cells** dialog box appears (Fig.Calc-3. 73).

4. *Select* the desired font style from the **Typeface** list box. In our case, we have selected the **Bold** font style (Fig.Calc-3. 73).
5. *Click* the **OK** button, as shown in Fig.Calc-3.73:

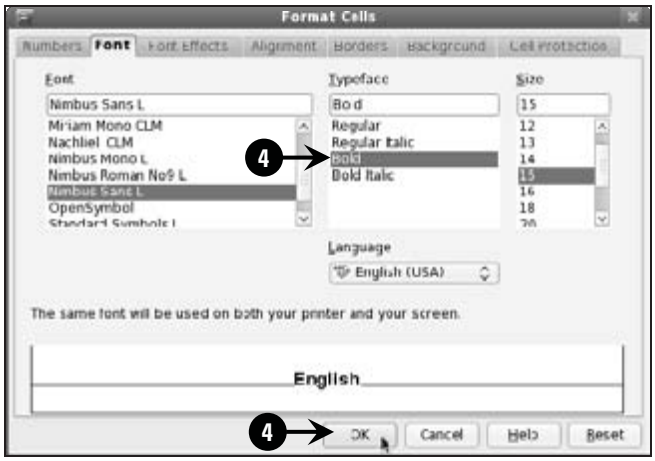


Fig.Calc-3.73

The selected font style is applied to the selected cell, as shown in Fig.Calc-3.74:

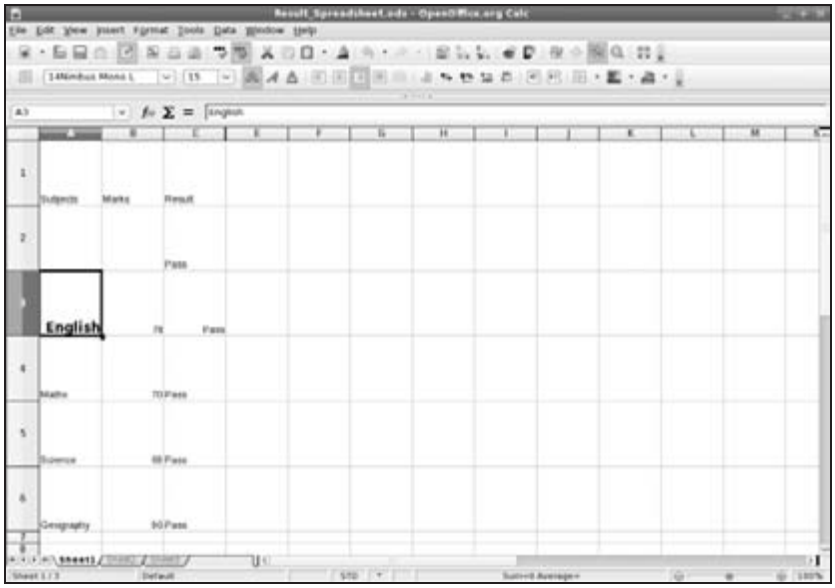


Fig.Calc-3.74

After learning how to format the data, let's now learn how to apply font effects.

Applying Font Effects

You can apply font effects to the content present in the spreadsheet to enhance its layout. There are various types of font effects, such as underlining, shadow, and outline, which are used to make the text more emphasizing and to increase the clarity of the text.

Let's learn to apply the outline effect.

Applying the Outline Effect

The outline effect applies outline to the characters of the text present in the cell.

Perform the following steps to apply the outline effect:

1. *Select* the text on which you want to apply the outline effect. In our case, we have selected the **English** text (Fig.Calc-3.75).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.75).
3. *Select* the **Cells** option from the drop-down menu, as shown in Fig.Calc-3.75:

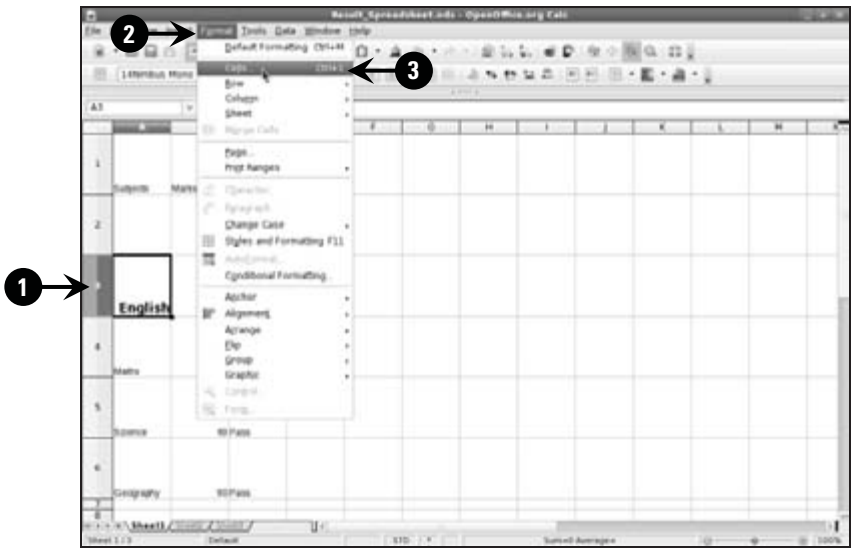


Fig.Calc-3.75

The **Format Cells** dialog box appears (Fig.Calc-3.76).

4. *Select* the **Font Effects** tab from the **Format cell** dialog box (Fig.Calc-3.76).
5. *Select* the **Outline** check box under the **Relief** category (Fig.Calc-3.76).
6. *Click* the **OK** button, as shown in Fig.Calc-3.76:

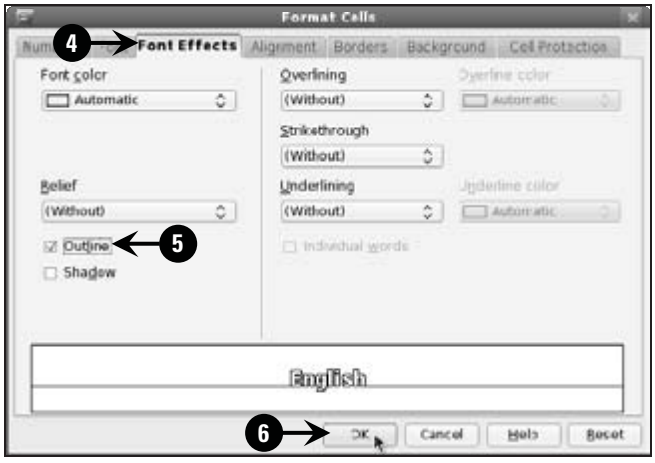


Fig.Calc-3.76

The outline effect is applied to the selected text, as shown in Fig.Calc-3.77:

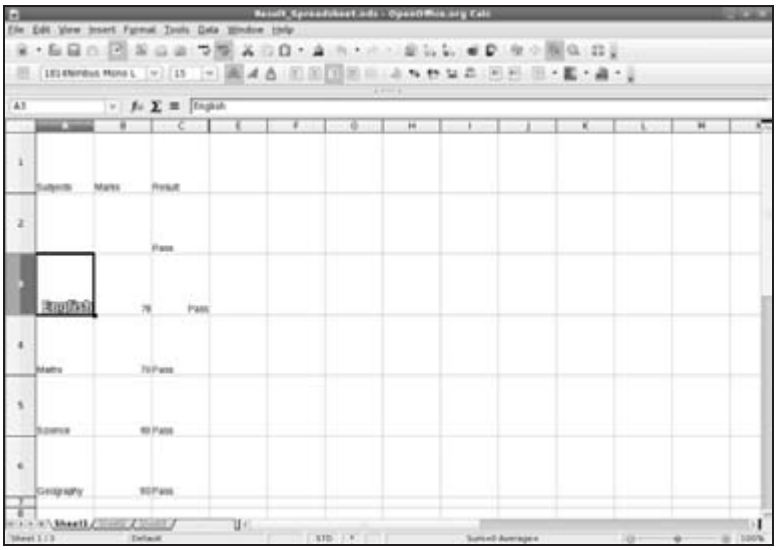


Fig.Calc-3.77

Now, let's learn to apply the shadow effect.

Applying the Shadow Effect

The shadow effect formats the text in such a way that it appears elevated from the page or screen surface.

Let's perform the following steps to apply the shadow effect:

1. *Select* the data on which you want to apply the shadow effect. In our case, we have selected the **English** text (Fig.Calc-3.78).
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.78).
3. *Select* the **Cells** option from the drop-down menu, as shown in Fig.Calc-3.78:

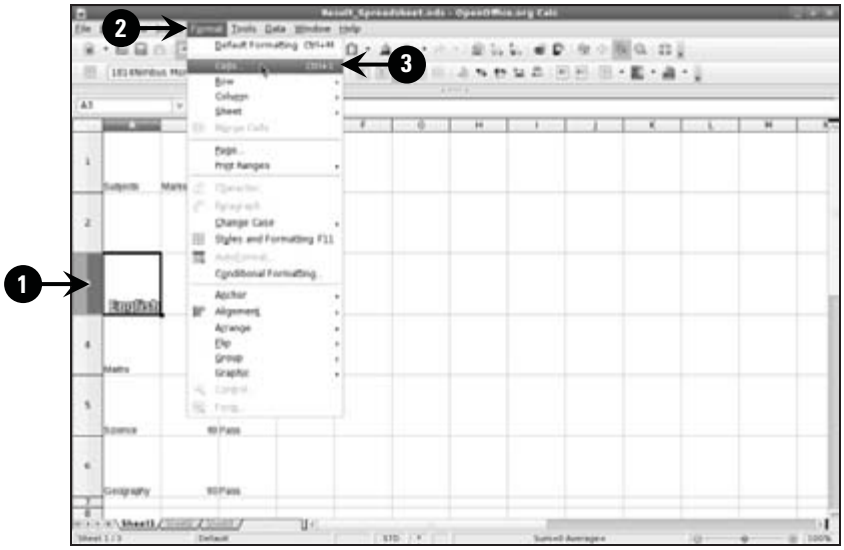


Fig.Calc-3.78

The **Format Cells** dialog box appears (Fig.Calc-3.79)

4. *Select* the **Shadow** check box under the **Relief** category (Fig.Calc-3.79).
5. *Click* the **OK** button, as shown in Fig.Calc-3.79:

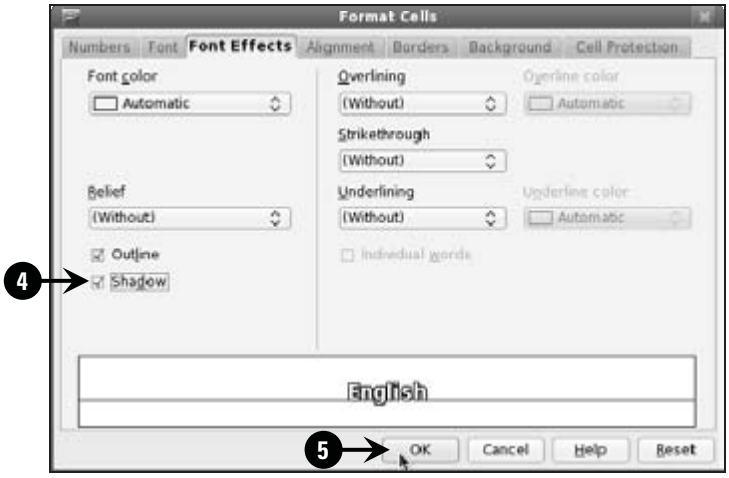


Fig.Calc-3.79

The shadow effect is applied to the selected data in the cell, as shown in Fig.Calc-3.80:

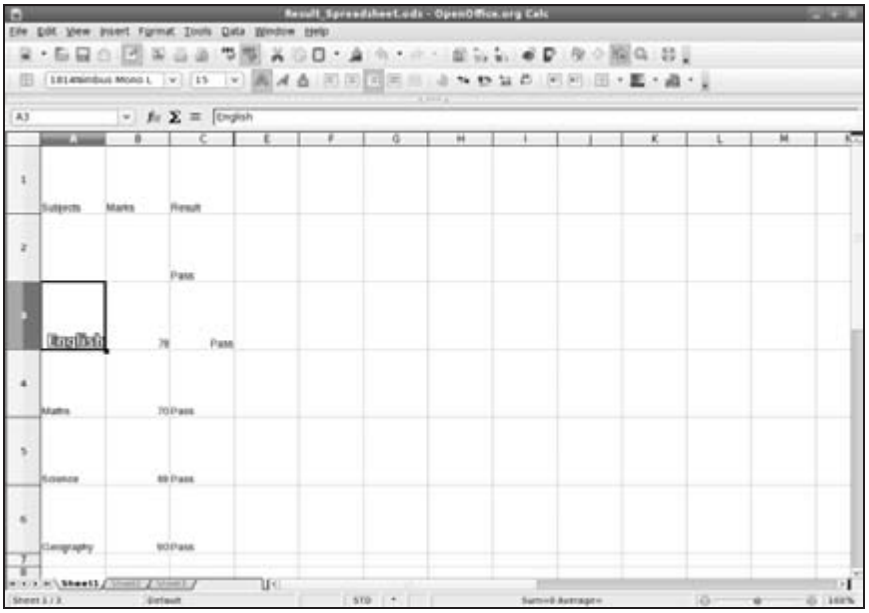


Fig.Calc-3.80



Similarly, you can also apply the engrave effect to the text. The engrave effect formats the text in such a way that it appears as if the text has been pressed into the page.

After learning about applying effects to the text, let's now learn about applying a border to a cell.

Applying a border to a Cell

If you want to highlight some cells in a spreadsheet, you can apply a border to them to make them stand out of the rest of the cells in the spreadsheet.

Let's perform the following steps to apply a border to a cell:

1. *Select* the cells on which you want to apply the border. In our case, we have selected the A6 cell, as shown in Fig.Calc-3.81:

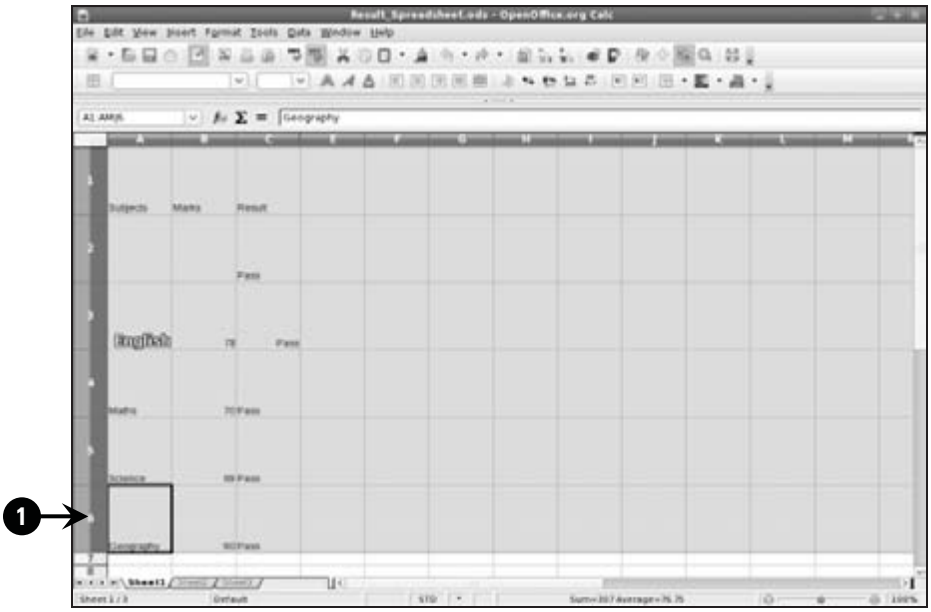


Fig.Calc-3.81

2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.82).
3. *Select the* **Cells** option from the drop-down menu, as shown in Fig.Calc-3.82:

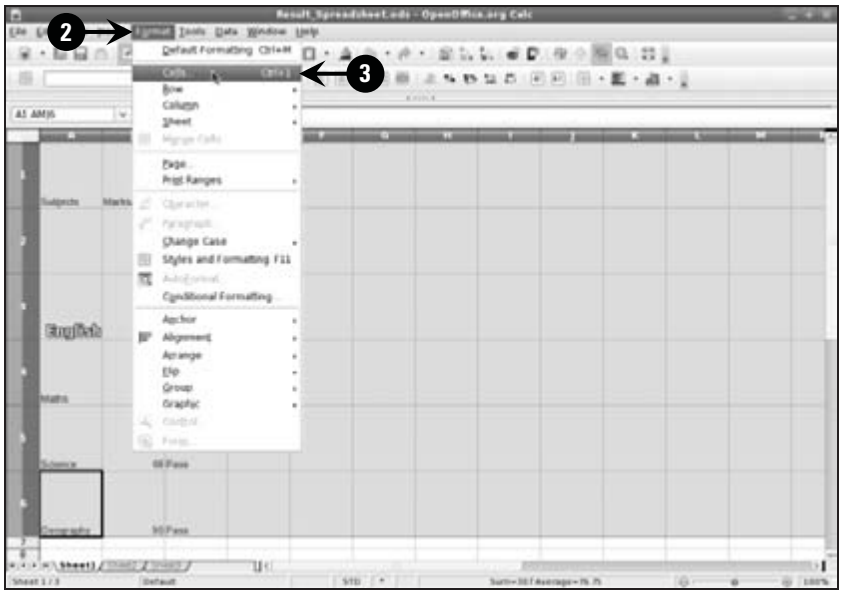


Fig.Calc-3.82

The **Format Cells** dialog box appears on the screen (Fig.Calc-3.83).

4. *Select* the **Borders** tab (Fig.Calc-3.83).

The **Borders** tab gets open (Fig.Calc-3.84).

5. *Click* the **Set Left and right border Only** option under the **Default** category (Fig.Calc-3.84).
6. *Click* the **OK** button (Fig.Calc-3.84).



Fig.Calc-3.83

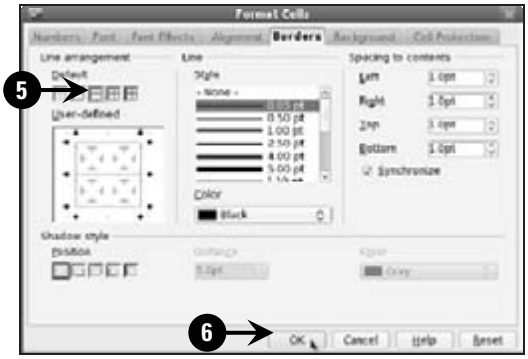


Fig.Calc-3.84

The border is applied to the **A6** cell, as shown in Fig.Calc-3.85:

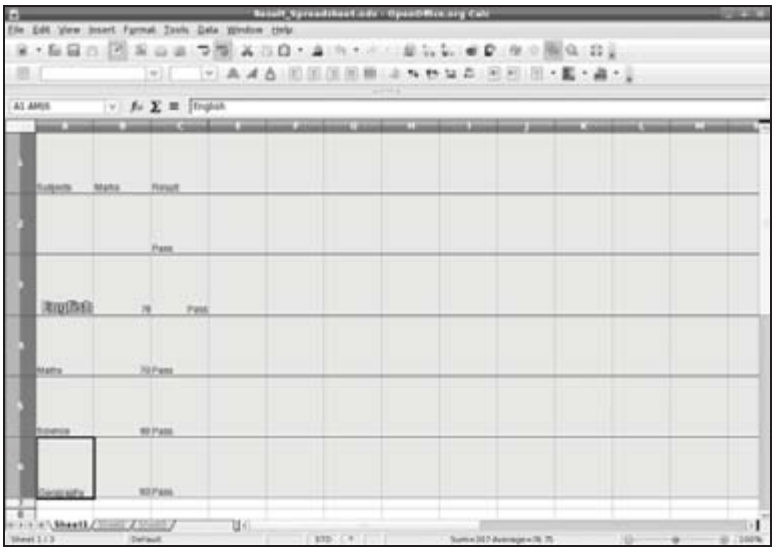


Fig.Calc-3.85

After learning about applying borders to the cells, let's now learn about the AutoFormat feature.

Exploring the AutoFormat Feature

A OpenOffice.org Calc spreadsheet has a number of rows and columns in which you can enter the data. The display gives a dull look if all cells and values have the same appearance. Therefore, OpenOffice.org Calc provides a number of formats that you can apply to spreadsheets to give them new and interesting appearance. You can format your spreadsheet by using the AutoFormat feature.

Let's perform the following steps to apply the AutoFormat feature to the rows:

1. *Select* the rows to which you want to apply the AutoFormat feature. In our case, we have selected the row from1 to 6 (Fig.Calc-3.86).
2. *Select* the **Format** menu in the menu bar. A drop-down menu appears (Fig.Calc-3.86).
3. *Select* the **AutoFormat** option, as shown in Fig.Calc-3.86:

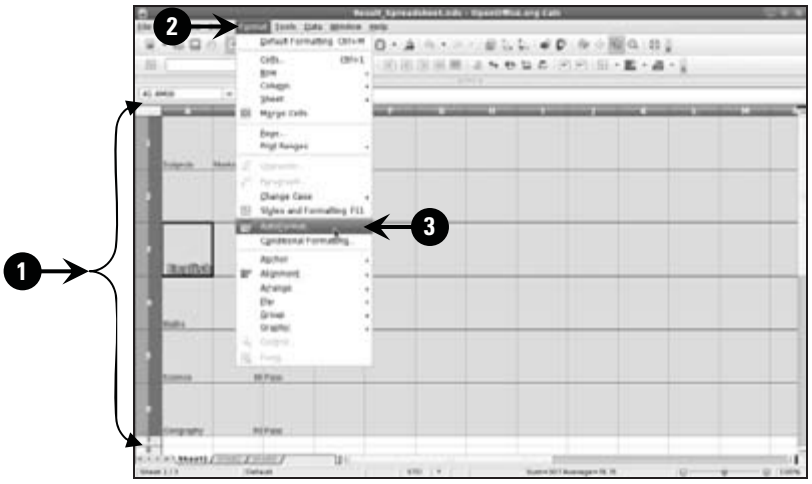


Fig.Calc-3.86

The **AutoFormat** dialog box appears (Fig.Calc-3.87).

4. *Select* the desired format style from the **Format** list box. In our case, we have selected the **Brown** format style (Fig.Calc-3.87).
5. *Click* the **OK** button, as shown in Fig.Calc-3.87:



Fig.Calc-3.87

The selected format style is applied to the cells, as shown in Fig.Calc-3.88:

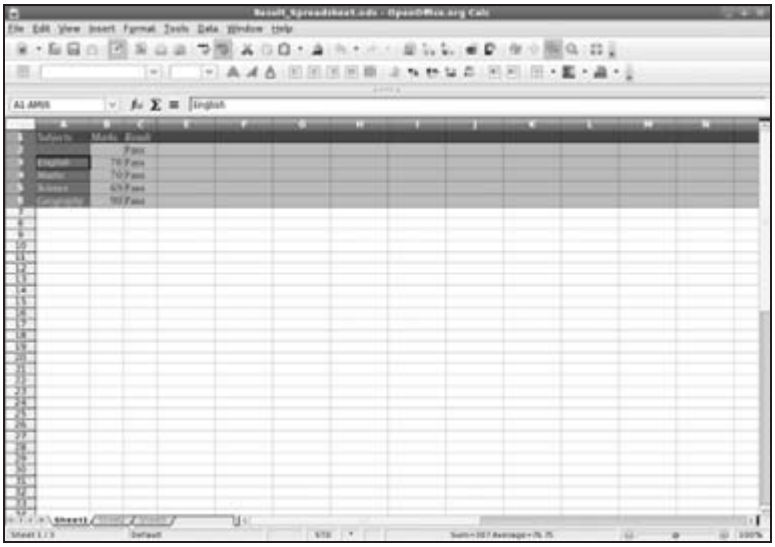


Fig.Calc-3.88

After learning to apply the AutoFormat feature to the spreadsheet, let's now learn to work with graphs.

Working with Graphs

The representation of the numerical data in the form of a chart is known as a graph. Graphs provide a pictorial view to understand the data easily.

Let's perform the following steps to insert a graph in the spreadsheet:

1. *Select* the cell range based on which you want to insert a graph (Fig.Calc-3.89).
2. *Select* the **Insert** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.89).
3. *Select* the **Chart** option from the drop-down menu, as shown in Fig.Calc-3.89:

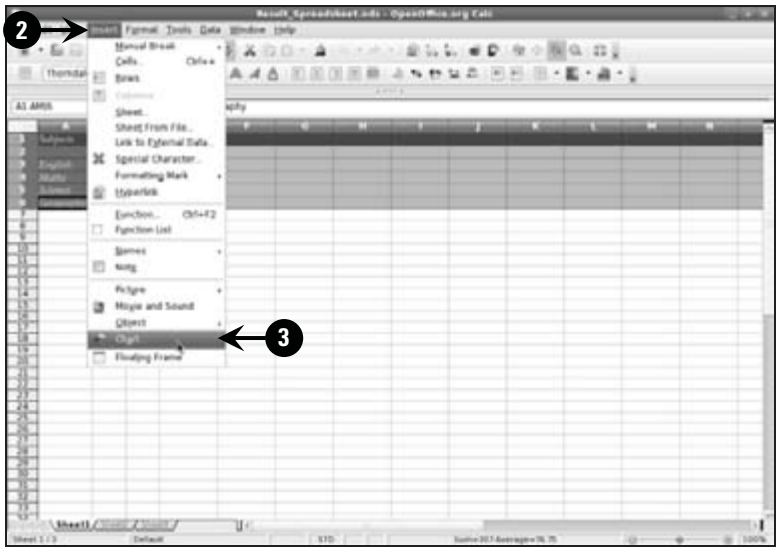


Fig.Calc-3.89

The **Chart Wizard** dialog box appears (Fig.Calc-3.90).

4. *Select* a chart type from the **Choose a chart type** list box. In our case, we have selected the **Area** chart type (Fig.Calc-3.90).
5. *Click* the **Next** button, as shown in Fig.Calc-3.90:

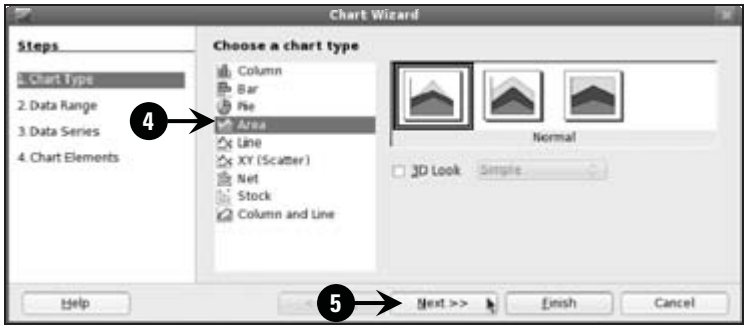


Fig.Calc-3.90

The **Data Range** section appears (Fig.Calc-3.91).

6. *Select* the **Data series in rows** radio button under the Choose a data range group (Fig.Calc-3.91).
7. *Click* the **Next** button, as shown in Fig.Calc-3.91:



Fig.Calc-3.91

The **Data Series** section appears (Fig.Calc-3.92).

8. *Click* the **Next** button, as shown in Fig.Calc-3.92:

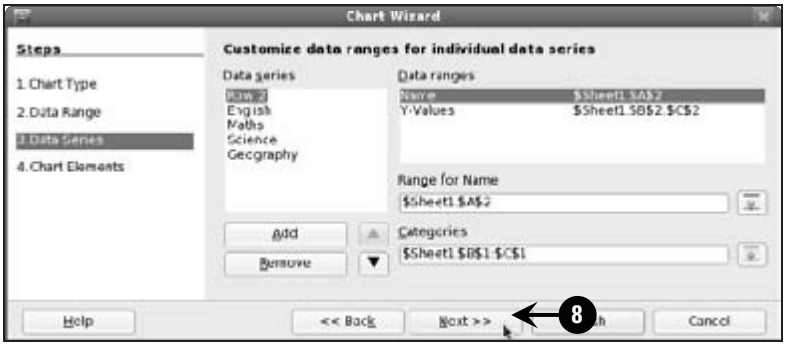


Fig.Calc-3.92

The **Chart Elements** section appears (Fig.Calc-3.93).

9. *Type* the title of the chart beside the Title text box. In our case, we have typed **Subject** (Fig.Calc-3.93).
10. *Type* the subtitle beside the **Subtitle** text box. In our case, we have typed **Marks** (Fig.Calc-3.93).
11. *Click* the **Finish** Button, as shown in Fig.Calc-3.93:



Fig.Calc-3.93

The graph is created, as shown in Fig.Calc-3.94:

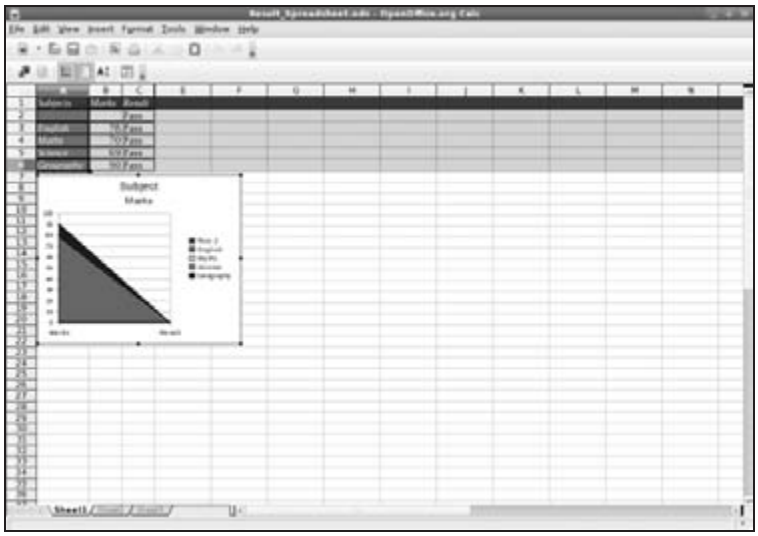


Fig.Calc-3.94

After learning how to insert a graph in a spreadsheet, let's now learn how to move the graph.

Moving the Graph

You can easily move a graph or any other object to reposition it. In our case, we are moving a graph that we have created in the preceding section.

Perform the following steps to move a graph:

1. Position the mouse-pointer on the outer boundary of the graph and click it, as shown in Fig.Calc-3.95:

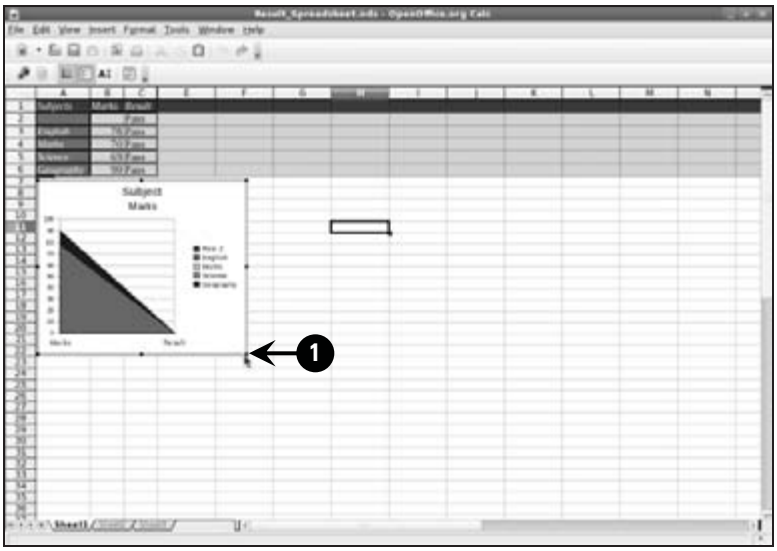


Fig.Calc-3.95

2. *Press* the mouse-button and *drag* the mouse pointer towards the location where you want to move the chart, as shown in Fig.Calc-3.96:

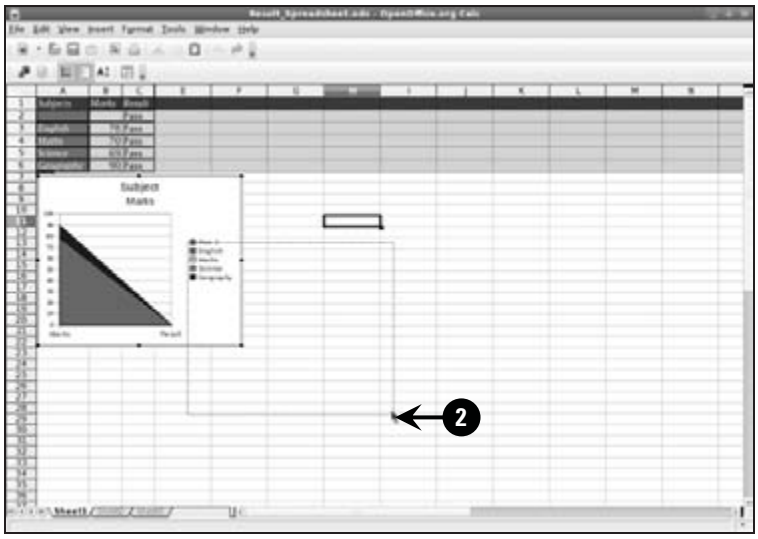


Fig.Calc-3.96

3. *Release* the mouse–button. The chart is moved to the desired location, as shown in Fig.Calc-3.97:

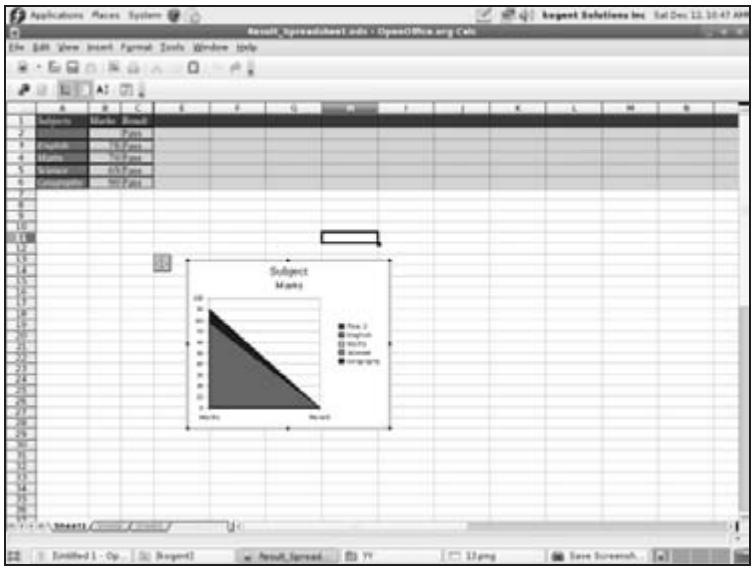


Fig.Calc-3.97

After learning how to move the graph, let's now learn to change the appearance of the graph.

Changing the Appearance of the Graph

When you create a graph, a default set of properties is applied to it. You can easily modify these default properties to change the appearance of the graph according to your requirement.

Let's perform the following steps to change the appearance of the graph:

1. *Select* the graph that you want to move. In our case, the graph is already selected.
2. *Select* the **Format** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.98).
3. *Select* the **Chart Area** option from the drop-down menu, as shown in Fig.Calc-3.98:

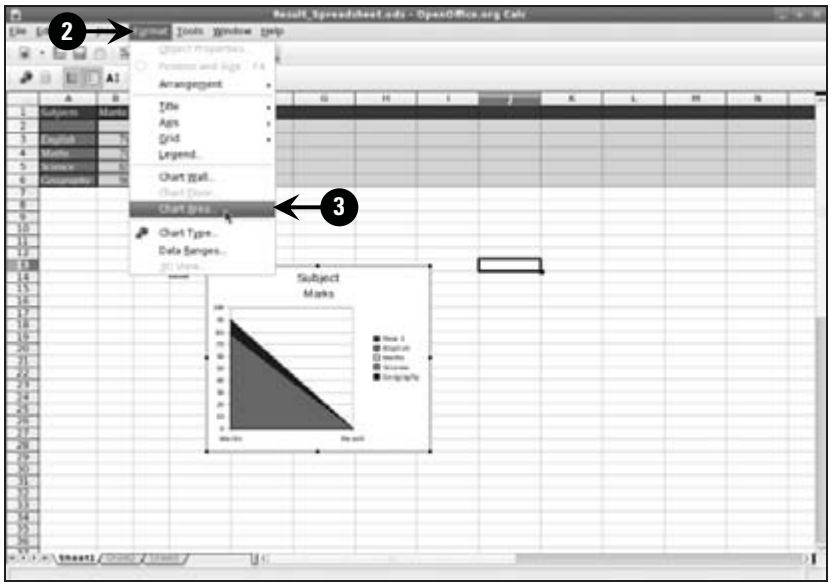


Fig.Calc-3.98

The Chart Area dialog box appears on the screen (Fig.Calc-3.99).

4. Click the down arrow under the **Style** list box (Fig.Calc-3.99).
5. *Select* the chart border style from the **Style** drop down menu. In our case, we have selected the **Fine Dotted** style (Fig.Calc-3.99).
6. *Click* the up or down arrow beside the **Width** option to set the width of the chart border. In our case, we have clicked the up arrow to set chart width to **0.06** (Fig.Calc-3.100).
7. *Select* the **Area** tab from the Chart Area dialog box (Fig.Calc-3.100).

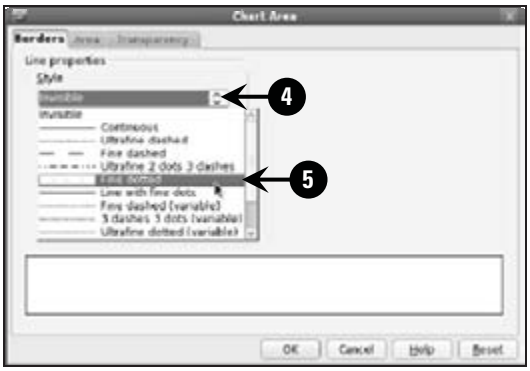


Fig.Calc-3.99

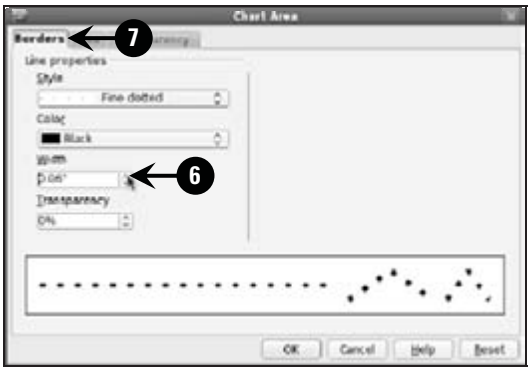


Fig.Calc-3.100

The Area tab gets open (Fig.Calc-3.101).

8. *Select* the fill option from the **Fill** list box. In our case, we have selected **Bitmap** (Fig.Calc-3.101).
   A list of options present in the **Bitmap** fill appears (Fig.Calc-3.102).
9. *Select* the desired bitmap fill option. In our case, we have selected **Droplets** (Fig.Calc-3.102).
10. *Click* the **OK** button (Fig.Calc-3.102).

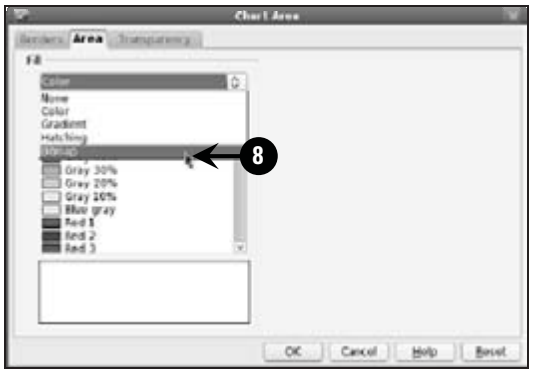


Fig.Calc-3.101

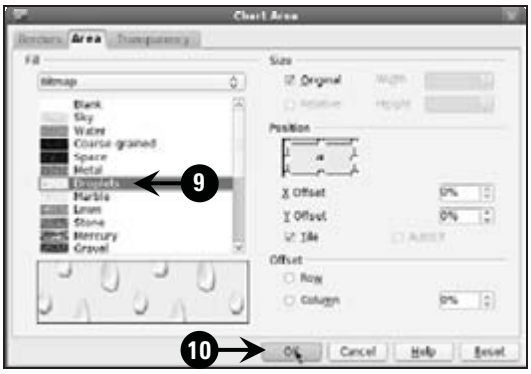


Fig.Calc-3.102

The appearance of the chart is changed, as shown in Fig.Calc-3.103:

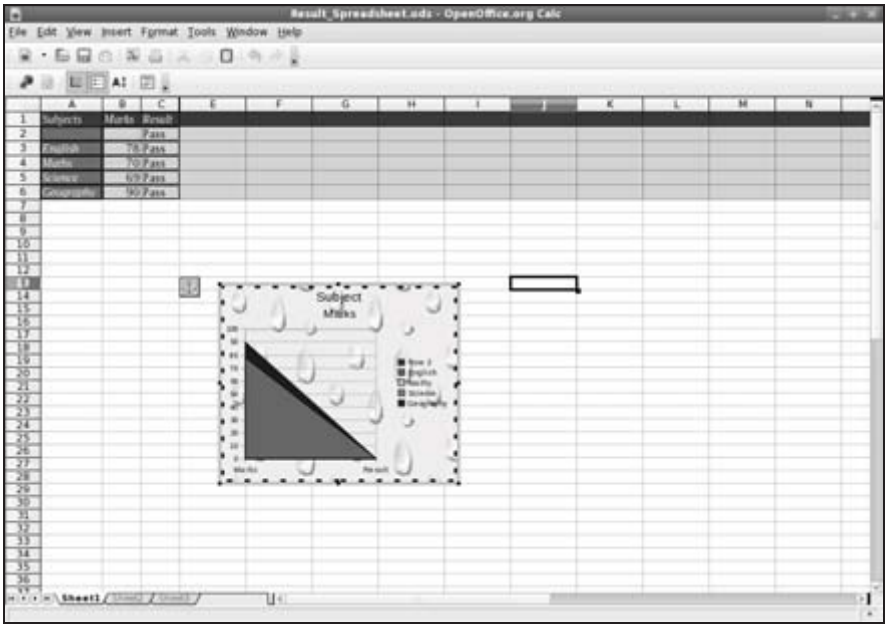


Fig.Calc-3.103

After learning to change the appearance of the graph, let's now learn to sort the data in a spreadsheet.

Sorting the Data in a Spreadsheet

Sorting the data in a spreadsheet rearranges the rows based on the content of a particular column. Sometimes you may want to sort the content, such as names in an alphabetical order or by some other field present in the spreadsheet. In that case, the sort option is used to sort the data. This option is very useful because it sorts a large amount of data within less time.

Let's perform the following steps to sort the data in a spreadsheet.

1. *Select* the cells on which you want to apply sorting, as shown in Fig.Calc-3.104:

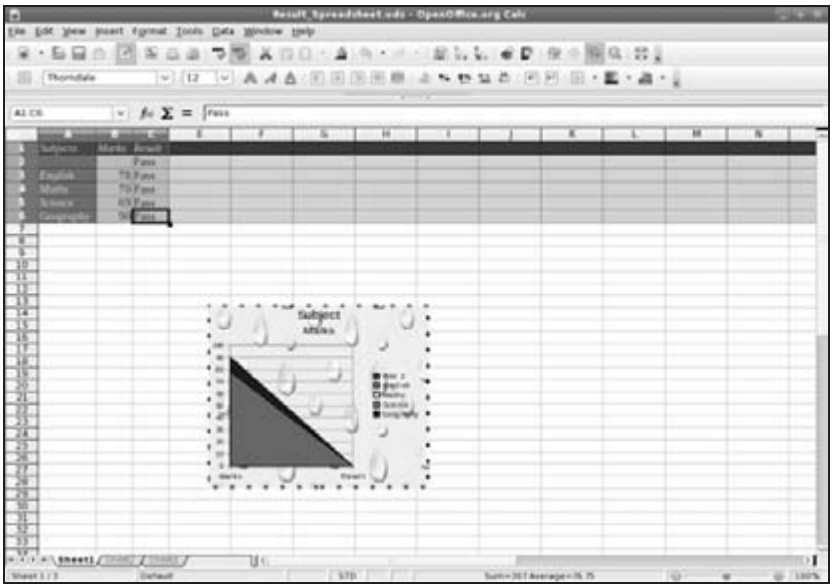


Fig.Calc-3.104

2. *Select* the **Data** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.105).
3. *Select* the **Sort** option from the drop-down menu, as shown in Fig.Calc-3.105:

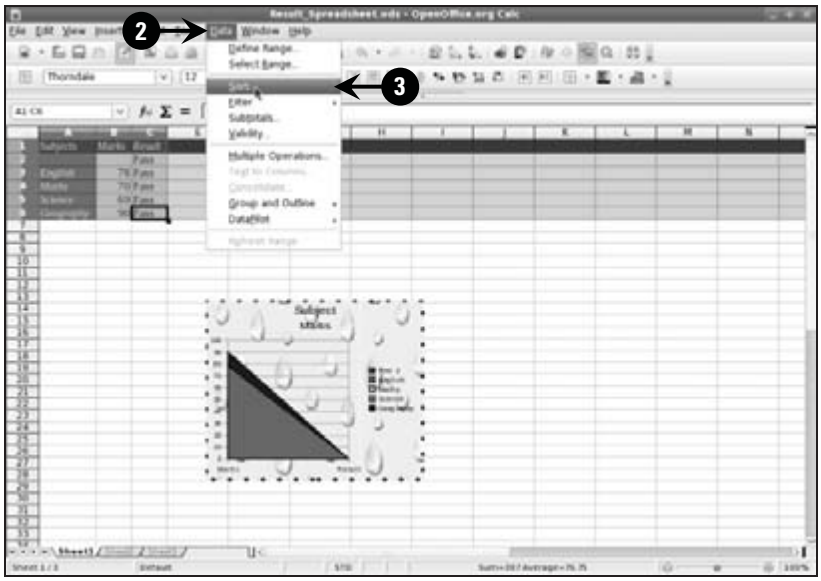


Fig.Calc-3.105

The **Sort** dialog box appears (Fig.Calc-3.106).

4. *Click* the down arrow beside the **Sort by** list box (Fig.Calc-3.106).
5. *Select* the **Marks** option from the **Sort by** drop-down list (Fig.Calc-3.106).
6. *Click* the down arrow below the **Then by** list box. A drop-down list appears (Fig.Calc-3.107).
7. *Select* the **Result** option from the **Then by** drop-down list (Fig.Calc-3.107).
8. *Click* the **OK** button (Fig.Calc-3.107).

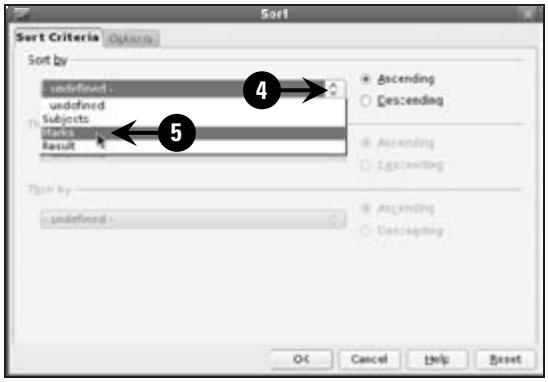


Fig.Calc-3.106

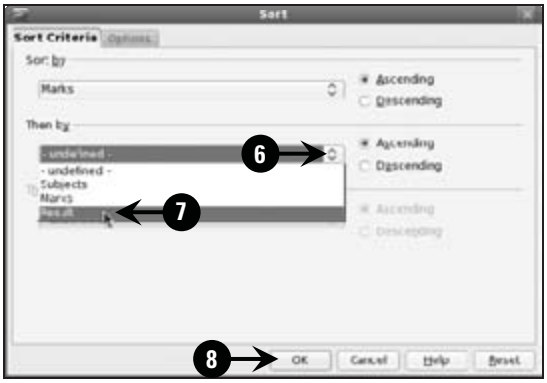


Fig.Calc-3.107

The sorting is applied to the selected cells, as shown in Fig.Calc-3.108:

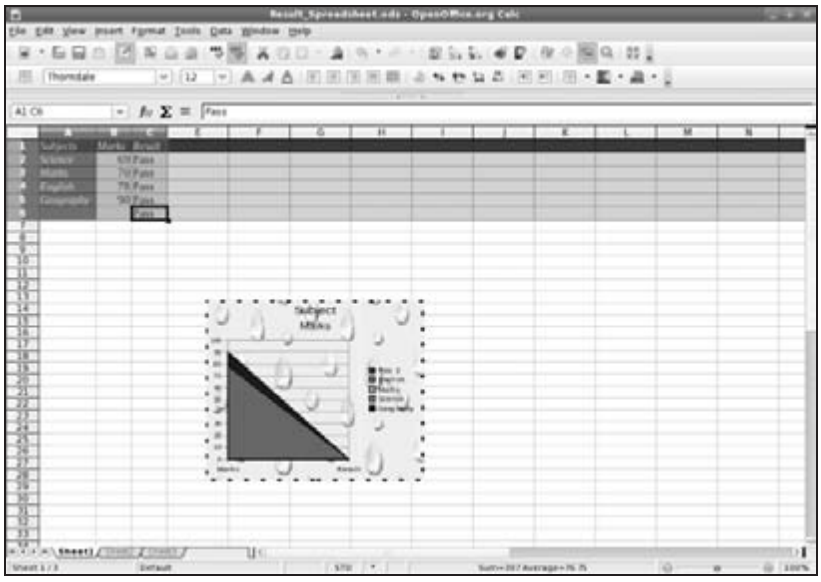


Fig.Calc-3.108

After learning how to sort the data in a spreadsheet, let's now learn to set the AutoSave feature.

Setting the AutoSave Feature

You can save your spreadsheet regularly at short intervals to avoid any loss of information. However, you can make save the spreadsheet automatically at regular intervals, for example, after every 10 minutes. OpenOffice.org Calc provides the AutoSave feature to save the spreadsheet automatically.

Let's perform the following steps to set the AutoSave feature in the spreadsheet:

1. Select the **Tools** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.109).
2. Select the **Options** option from the drop-down menu, as shown in Fig.Calc-3.109:

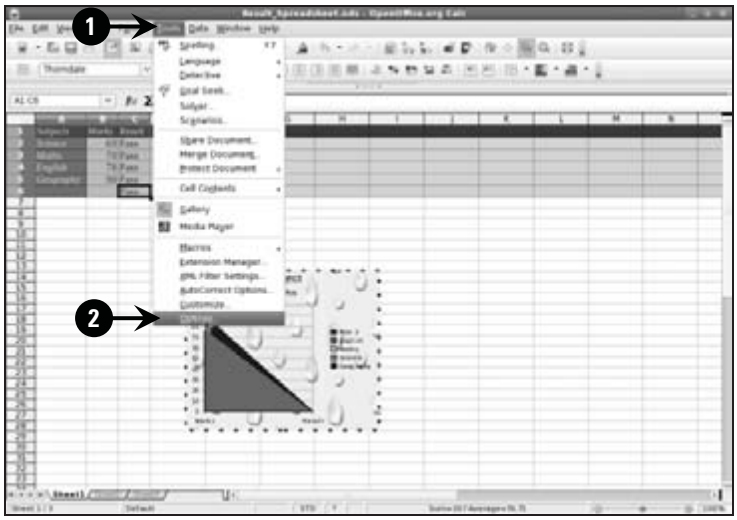


Fig.Calc-3.109

The **Options-OpenOffice.org** dialog box appears (Fig.Calc-3.110).

3. *Select* the **Load/Save** node from the left pane of the Options-OpenOffice.org dialog box (Fig.Calc-3.110).
4. *Select* the **General** option under the **Load/Save** node, as shown in Fig.Calc-3.110:



Fig.Calc-3.110

5. *Select* the **Save AutoRecovery information every** checkbox under the **Save** category. The **Minutes** spin box option gets enabled, as shown in Fig.Calc-3.111:



Fig.Calc-3.111

6. *Click* the up or down arrow beside the **Minutes** spin box and set the minutes. In our case, we have set 15 minutes (Fig. Calc-3.112).
7. *Click* the **OK** button, as shown in Fig.Calc-3.112:

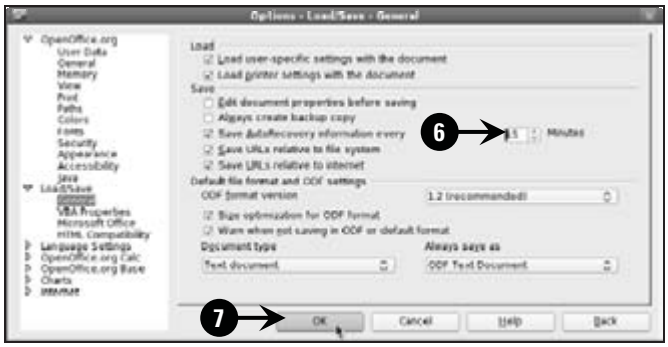


Fig.Calc-3.112

The AutoSave feature is applied to your spreadsheet.

After learning about the AutoSave feature, let's now learn how to protect a spreadsheet.

Protecting a Spreadsheet

A spreadsheet may contain important information, loss of which can cause a great trouble. You can prevent unauthorized access to the data by protecting your spreadsheet with a password.

Let's perform the following steps to protect a spreadsheet:

1. *Select* the **Tools** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.113).
2. *Select* the **Protect Document** option from the drop-down menu. A sub menu appears (Fig.Calc-3.113).
3. *Select* the **Sheet** option from the sub menu, as shown in Fig.Calc-3.113:

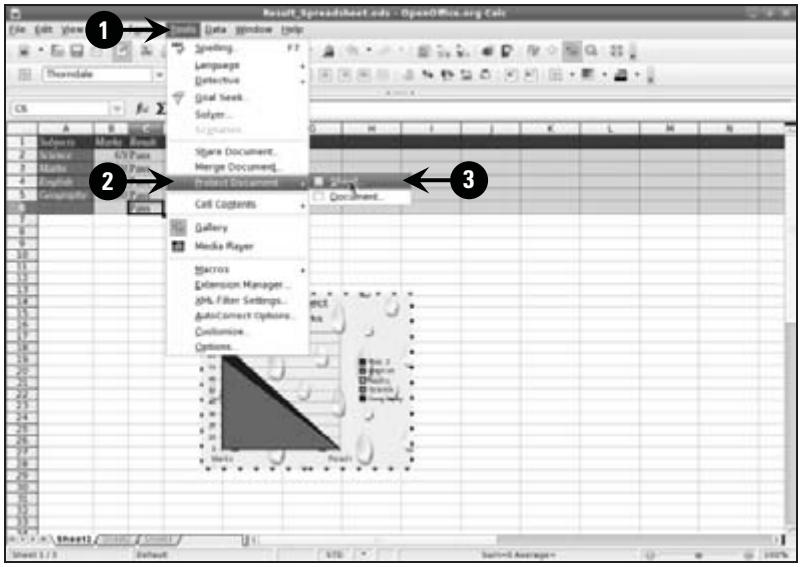


Fig.Calc-3.113

The **Protect Sheet** dialog box appears (Fig.Calc-3.114)

4. *Type* the password in the **Password** text box. In our case, we have typed **kavita** (Fig.Calc-3.114).

5. *Retype* the same password in the **Confirm** textbox (Fig.Calc-3.114).
6. *Click* the **OK** button, as shown in Fig.Calc-3.114:

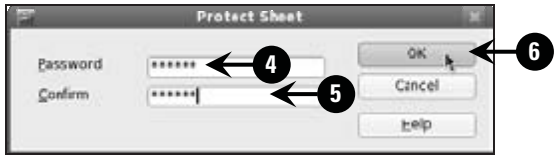


Fig.Calc-3.114

7. *Click* the empty cell in the spreadsheet. In our case, we have clicked the J11 cell, as shown in Fig.Calc-3.115:
8. *Type* any data in **J11** cell (Fig.Calc-3.115).

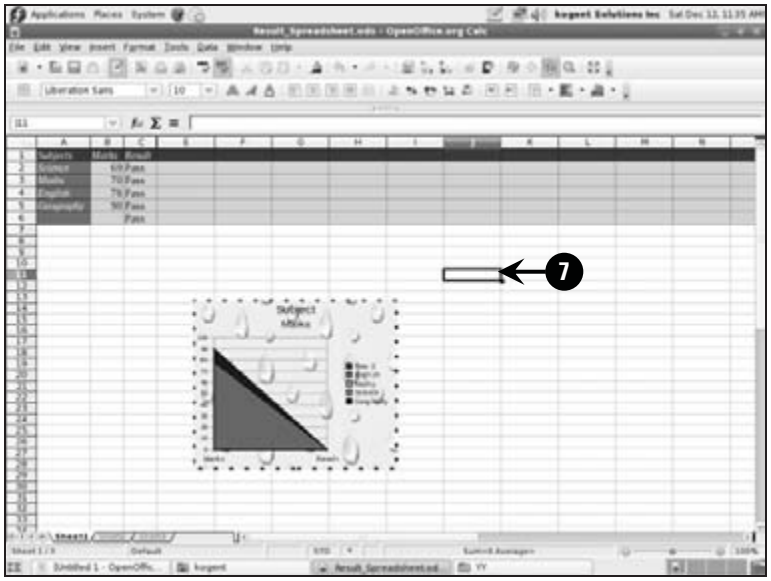


Fig.Calc-3.115

The **OpenOffice.org 3.1** message box appears which tells you that your sheet is protected and no one can make changes to it (Fig.Calc-3.116).

9. *Click* the **OK** button, as shown in Fig.Calc-3.116:

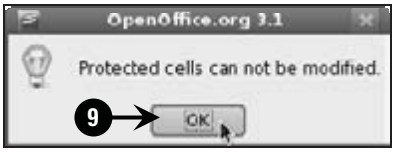


Fig.Calc-3.116

After learning how to protect the data in the sheet, let's now learn to save the spreadsheet.

Saving the Changes Made to a Spreadsheet

If you do not want to lose the information that you have added to the spreadsheet, you should keep saving it from time to time.

Let's perform the following steps to save the changes made to a spreadsheet:

1. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.117).

2. *Select* the **Save** option from the drop-down menu, as shown in Fig.Calc-3.117:

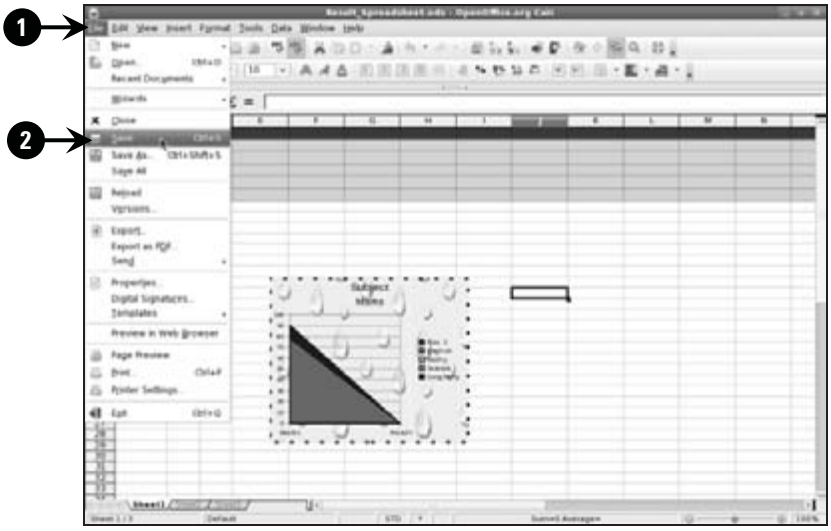


Fig.Calc-3.117

The spreadsheet has been saved.

After learning to save the spreadsheet, let's now learn how to print the spreadsheet.

Printing the Spreadsheet

After performing all the tasks in the spreadsheet, you can print a spreadsheet by using the print option.

Let's perform the following steps to print the spreadsheet:

1. *Select* the **File** menu from the menu bar. A drop-down menu appears (Fig.Calc-3.118).
2. *Select* the **Print** option from the drop-down menu, as shown in Fig.Calc-3.118:

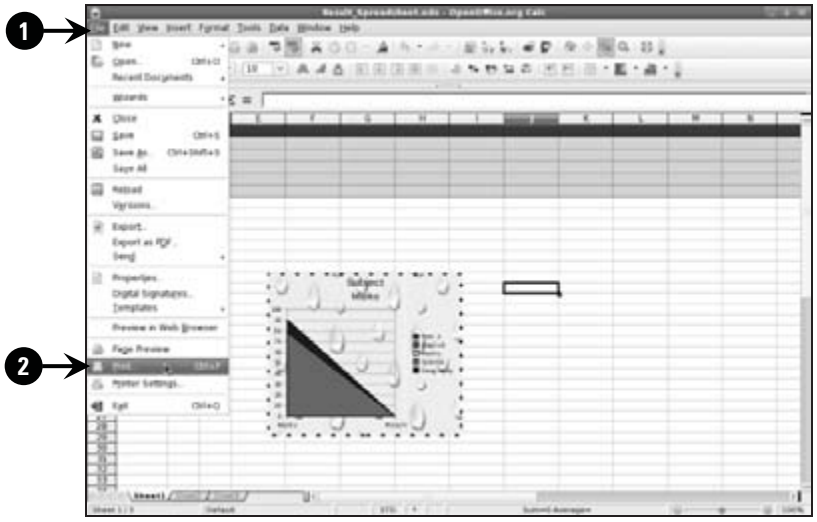


Fig.Calc-3.118

The **Print** dialog box appears (Fig.Calc-3.119).

3. *Select* the printer from which you want to print the spreadsheet. In our case, we have selected the default **Generic Printer** (Fig.Calc-3.119).
4. *Select* the **Pages** radio button under the **Print range** category. In our case, we have selected the page range from page **1-2,** as shown in Fig.Calc-3.120:

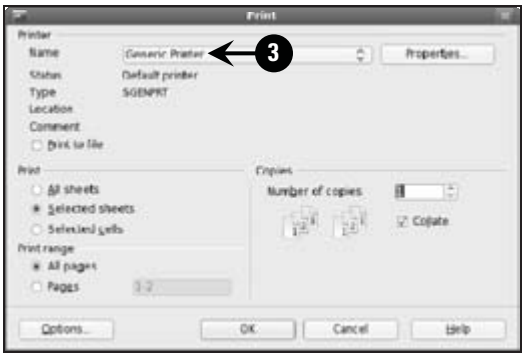


Fig.Calc-3.119

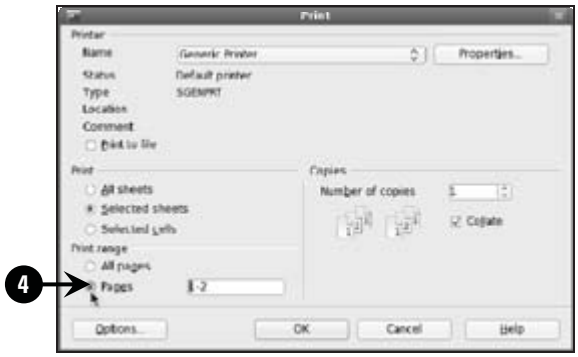


Fig.Calc-3.120

5. *Click* the up or down arrow of the **Number of copies** spin box to increase or decrease the number of copies you want to print. In our case, we have set number of copies to 2 (Fig.Calc-3.121).
6. *Click* the **OK** button, as shown in Fig.Calc-3.121:

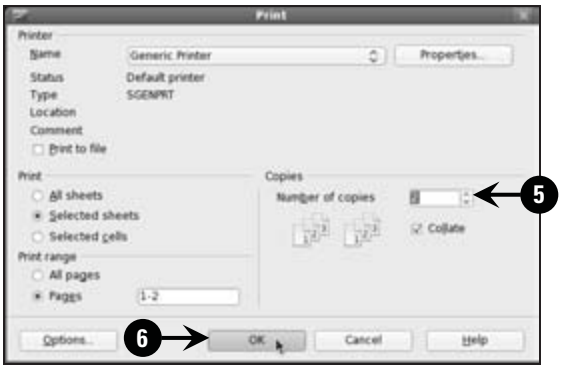


Fig.Calc-3.121

With this, we come to the end of this chapter. Before moving ahead towards the next chapter, let's summarize the main topics of the chapter.

Summary

In this chapter, you have learned how to work with the OpenOffice.org Calc spreadsheet layout. In the beginning of this chapter, you have learned to open an existing spreadsheet and insert a new spreadsheet. Further, you have learned to perform operations, such as copying and moving the content of the spreadsheet. You have also learned certain basic operations, such as moving, renaming and deleting a spreadsheet. In addition, you have learned the basics to work with rows and columns. You have also implemented tasks required to work with spreadsheets, such as undoing an action, inserting a series, changing column width, hiding a column, increasing a row height, and aligning the data. You have also learned how to format the text and apply various formatting styles, such as font effects and cell border. You have also learned about the AutoFormat feature and graphs. The chapter also discussed how to sort data, set the AutoSave feature, and protect a spreadsheet. In the end, you have learned to save and print the spreadsheet.

CHAPTER

1

Introduction to HTML

In this Chapter:

- Exploring Web Browser
- Exploring the Web Server
- Exploring HTML Editors
- Understanding HTML Document Structure
- Creating Your First HTML Document
- Saving the HTML Document
- Previewing the HTML Document
- Creating Paragraphs
- Adding Line Breaks
- Creating Numbered Lists
- Inserting an Image to the Web Page
- Adding a Table
- Working with Hyperlinks
- Creating a Frame

HTML or Hypertext Markup Language is developed by Tim Berners-Lee. It is a markup language used for creating and defining Web pages. Markup language means the language that uses special symbols that are inserted in a text document to define the structure of a Web page. Hypertext means the text present on the Web page that consists of a link to access the other Web page. A Web page is a document that is connected to World Wide Web (WWW) and contains information, such as text, graphics, tables, and videos in a structured manner. In hypertext, the hyper word is used because the linking of the Web pages is not linear. It means when you click a link, it is not necessary that the corresponding page is just the next page; it can be any page. HTML provides various tags for adding content on your HTML document, such as text, image, tables, forms, and frames. These tags are case-insensitive that means you can use tags in upper or lower case.

In this chapter, you learn the basics of HTML programming, and some basic concepts, such as Web browser, Web server, and HTML editors. You also learn the basic structure of HTML document, and then learn to create and save your first HTML document. After creating the HTML document, you learn to view it in a Web browser. Further, you explore how to add line breaks and create paragraphs and numbered list to organize the list of items. You also explore the process to insert an image in your HTML document, and add tables and hyperlinks. Finally, you learn the concept of frame that is used to display multiple HTML documents in the same browser window at a time.

After getting an overview of HTML, let's now learn about Web browser.

Exploring Web Browser

A Web browser is a application that allows you to interact with the information on World Wide Web. When you install Linux on your computer, the Mozilla Firefox Web browser is installed automatically. You learned to access the Internet using a Web browser. After creating your HTML document, you can view it in a Web browser. It not only shows the HTML document on the Web browser but also assembles components of your HTML document and arranges those components in accordance with the tags written in the document.

In the preceding section, you have learned about the Web browser. Let's now learn about the Web server.

Exploring the Web Server

The Web server is machine that acts as a server to process request made by the client and provide response. The Web server uses Hypertext Transfer Protocol (HTTP) to deliver the HTML documents. When a client requests for a particular resource by using HTTP, the server responds to that request.

Let’s learn a bit more about how we get a Web page from the Web server. If you want to access information from the Internet you need to enter Uniform Resource Locator (URL) in to your Web browser. Web browser is running in the client machine. This Web browser connects to the Web server that is running on another machine by using Hypertext Transfer Protocol (HTTP) and sends a request for a particular resource. Once the request is received, the Web server sends back the responds to the Web browser as per the request.

In the preceding section, you have learned about the Web server. Let's now learn about the HTML editors.

Exploring HTML Editors

For creating HTML documents, you need a text-editing program. You can use simple text editors, HTML editors, and OpenOffice.org Writer to create an HTML document. Fedora 11 provides gedit as the default text editor. HTML editors are software applications that are used to design Web pages and develop HTML documents. Bluefish and Quanta Plus are examples of Linux HTML editors. Bluefish HTML editor runs on GNOME and KDE desktop environment and Quanta Plus comes bundled with KDE but GNOME users have option to load some libraries and helper applications to run Quanta Plus. After creating an HTML document in OpenOffice.org Writer, you can save it in the HTML file format.

In the preceding section, you have learned about HTML editors. Let's now learn about the structure of an HTML document.

Understanding HTML Document Structure

An HTML document consists of HTML tags and some plain text. Each document has HTML version, HTML tags, document header, document title, and body part. Listing 1.1 shows the structure of an HTML document:

Listing 1.1: The Basic Structure of an HTML Document

```
<!DOCTYPE>
<html>
<head>
<title>  My First Document </title>
</head>
<body>
This is the first HTML page
</body>
</html>
```

In Listing 1.1, <!DOCTYPE> indicates the HTML version. The <html> and </html> tags define the starting and closing of the HTML document. The <head> and </head> tags define the document header. In between the document header, we define the title that requires <title> and </title> tags. The <body> and </body> tags define starting and ending of your body part of the document where you add the actual content. In the following section, you learn about these parts in brief.

Declaring Document Type

The <DOCTYPE> declaration is the first thing that you need to add in your HTML document. DOCTYPE is not an HTML tag, rather it is used before the <html> tag as an instruction that specifies Document Type Definition (DTD) used by the document. The DTD defines rules that a markup language uses and version of HTML that you are using. HTML 4.01 comes with three different document types:

- **HTML 4.01 Strict:** Emphasizes structural elements over presentational elements. It does not contain deprecated elements. The declaration for this document type is as follows:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
"http://www.w3.org/TR/html4/strict.dtd">
```

- **HTML 4.01 Transitional:** Includes structural, presentational, and deprecated elements. The declaration for this document type is as follows:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
```

- **HTML 4.01 Frameset:** Refers to the document type that is similar to the transitional type but it supports elements that are needed to create frames on your HTML document. The declaration for this document type is as follows:

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Frameset//EN"
"http://www.w3.org/TR/html4/frameset.dtd">
```

Exploring HTML Tags

HTML documents contain HTML tags that define the overall layout of the Web page. These HTML tags use the symbol <>. In between <> symbol, we provide the element name. Most of the HTML tags have an opening and closing tags. The opening tag defines that from where tag is starting whereas the closing tag specifies where it ends. For example, <html> and </html> are opening and closing tags to define starting and closing of an HTML document.

Exploring Document Header

A document header contains the processing information and metadata for an HTML document. Meta data contains information about the Web page. The <head> and </head> are opening and closing tags for the document header. The information that comes under the document header part does not appear in the Web browser.

Exploring Document Title

Each document required a title name to identify the Web page. The title of the HTML document appears at the top of the browser when it is displayed in a Web browser. HTML provides you the <title> tag to add a title in your document. The closing tag for title is </title>. You can specify a suitable title for your HTML document so that it provides an idea of the contents of the HTML document. For example, suppose you want Kogent Solutions as title name of your HTML document. Then, you write it as follows:

```
<title>Kogent Solutions </title>
```

Body of HTML Document

While preparing the HTML document, in addition to write basic HTML tags, you add some text, images, lists, and tables in the document. All these things come inside the body of your HTML document. All the contents that you want to put inside the body of the HTML document comes in between <body> and </body> tags. The information that you add in these two tags is the actual content that you can display in the Web browser.

Exploring Meta Data

Meta data is the data that describes the other data. In the HTML document, metadata contains the information, such as editor type that you are using, information about the author, content description, and information about the copyright. In addition to the title, the metadata is added in the head part of your HTML document. The <meta /> tag is used for metadata. This tag provides a short description of the Web page. The following example shows how to use the meta tag in an HTML document:

```
<meta name ="description" content="Everything you wanted to know about Kogent" />
```

In the preceding section, you have learned about basic structure of an HTML document. Let's now learn how to create your first HTML document.

Creating Your First HTML Document

You have learned the basic HTML tags. Now, you can create your first HTML document. For creating an HTML document, you need a text editor where you can write the HTML tags and content that you want in your HTML document. In Fedora 11, gedit is the default text editor, which is used to create the document.

Perform the following steps to create your HTML document:

1. *Select* **Applications→Accessories→Text Editor** to open the gedit window, as shown in Fig.LP-1.1:

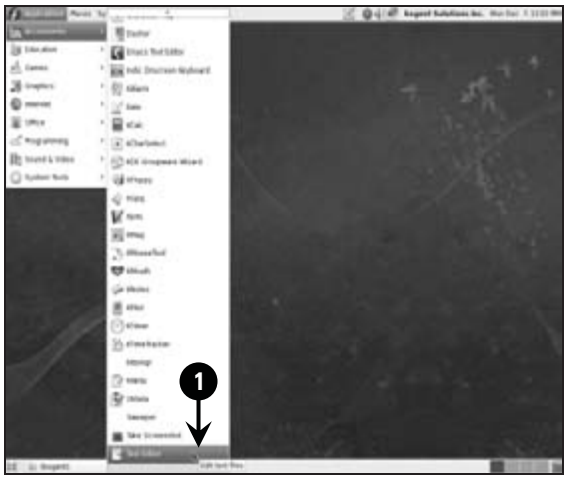


Fig.LP-1.1

The text editor window appears with the new blank text file, as shown in Fig.LP-1.2:

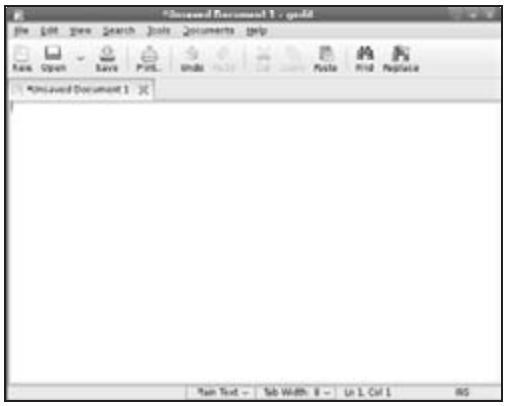


Fig.LP-1.2

2. *Type* the following code snippet provided in Listing 1.2 in the gedit window (Fig.LP-1.3).

Listing 1.2: Code to Create the Basic HTML Document

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
"html://www.w3.org/TR/htm14/strict.dtd">
<html>
<head>
<title>Kogent Solutions </title>
</head>
<body>
Kogent Solutions Inc. is a Knowledge and HR Solutions company specializing in
developing content and graphics and providing training and recruitment services.
Our knowledge solutions division offers high quality, cost-effective, and
innovative learning solutions for a wide spectrum of audience right from K12 level
to career building and development.
</body>
</html>
```

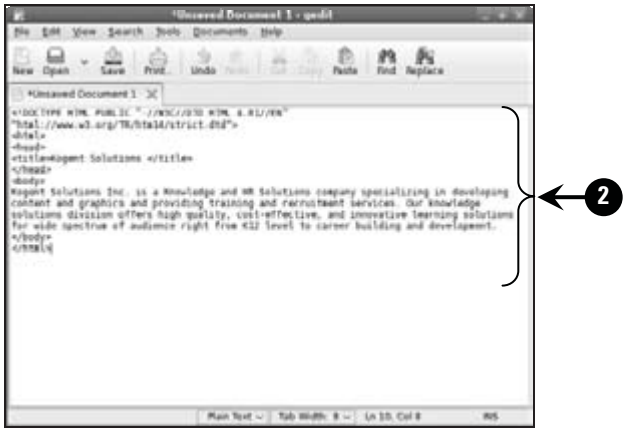


Fig.LP-1.3

You have created your first HTML document.

In the preceding section, you have learned how to create your first HTML document. Let's now learn how to save your HTML document.

Saving the HTML Document

After creating the HTML document, you can save it with the .html or .htm file extension. You can save the HTML document in a directory on your hard drive where you would like to keep your documents.

Perform the following steps to save the HTML document:

1. *Click* the **File** menu on the Menu bar of the text editor window (Fig.LP-1.4). A drop-down menu appears (Fig.LP-1.4).
2. *Select* the **Save As** option from the drop-down menu (Fig.LP-1.4).

   The **Save As** dialog box appears (Fig.LP-1.5).
3. *Type* the document name in the **Name** text box. In our case, we have typed **MyFirstdoc.html** as the HTML document name (Fig.LP-1.5).
4. *Select* the arrow beside the **Browse for other folders** option to expand the dialog box (Fig.LP-1.5).



Fig.LP-1.4

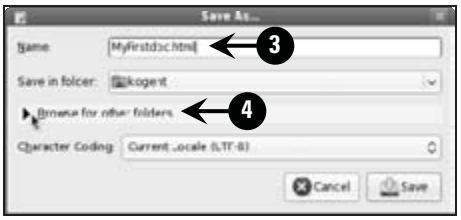


Fig.LP-1.5

The **Save As** dialog box gets expanded (Fig.LP-1.6).

5. *Select* a directory where you want to save your documents. In our case, we have selected the **kogent** directory. You can create your own sub-directory inside the directory where you can keep your documents. For example, we have already created an HTML files folder in the kogent directory.
6. *Double-click* a sub-directory if you want to keep your HTML documents in that directory. In our case, we have opened the HTML files folder (Fig.LP-1.6).

   The HTML files folder opens in the Save As dialog box (Fig.LP-1.7).
7. *Click* the **Save** button (Fig.LP-1.7).



Fig.LP-1.6



Fig.LP-1.7

The document is saved in the selected location. After saving the document, the document name appears on the title of the editor window, as shown in Fig.LP-1.8:



Fig.LP-1.8

After saving your HTML document, let's now learn to view it in a Web browser.

Previewing the HTML Document

After creating and saving your HTML document, you can view the content of HTML document in a Web browser. When you view the HTML document in the Web browser, you get an idea of how your HTML document will appear on the Web. In Fedora, Mozilla Firebox is the default Web browser. In this chapter, you learn to display your HTML document in the Web browser.

Undertake the following steps to preview your HTML document:

1. *Open* the Mozilla Firefox Web browser, as shown in Fig.LP-1.9:



Fig.LP-1.9

2. *Click* the **File** menu (Fig.LP-1.10). A drop-down menu appears (Fig.LP-1.10).
3. *Select* the **Open File** option from the drop-down menu, as shown in Fig.LP-1.10:



Fig.LP-1.10

An **Open File** dialog box appears (Fig.LP-1.11).

4. *Select* the location from the **Places** pane where you have saved your HTML document and then *select* sub-directory if your document is inside that sub-directory. In our case, it is **HTML files** folder under **kogent** directory (Fig.LP-1.11).
5. *Click* the **Open** button (Fig.LP-1.11).
6. *Select* the HTML document that you want to view in the Web browser. In our case, it is **MyFirstdoc.html** document (Fig.LP-1.12).
7. *Click* the **Open** button (Fig.LP-1.12).

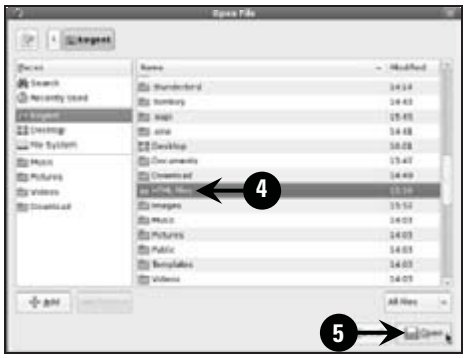


Fig.LP-1.11

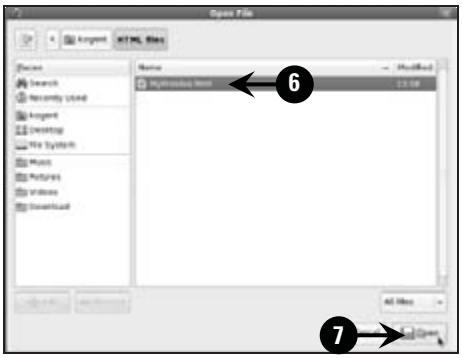


Fig.LP-1.12

The Web browser displays your HTML document, as shown in Fig.LP-1.13:



Fig.LP-1.13

In the preceding section, you have learned to view an HTML document in a Web browser. Let's now learn to create a paragraph in your HTML document.

Creating Paragraphs

While working with text in your document, you need to write text in different paragraphs to divide the related information into different sections.

In a text editor or OpenOffice.org Writer, you press the ENTER key to create paragraphs but in HTML, you cannot create paragraphs by pressing the ENTER key. The reason for that is HTML only recognizes the single space between characters. If you want to create paragraphs in the HTML document, HTML provides you tags. The opening and closing tags for creating paragraphs are and . Write the opening tag from where you want to start a separate paragraph and put tag where you want to end the paragraph. Perform the following steps to create paragraphs in your document:

1. *Insert* the ** ** tag from where you want to start a paragraph in the body part of the document (Fig.LP-1.14).
2. *Insert* the ** ** tags where you want to end the paragraph in the MyFirstdoc.html HTML document (Fig.LP-1.8). In our case, we have created two paragraphs in the HTML document (Fig.LP-1.14).
3. *Click* the **File** menu on the Menu bar (Fig.LP-1.15). A drop-down menu appears (Fig.LP-1.15).
4. *Select* the **Save As** option from the drop-down menu (Fig.LP-1.15).



Fig.LP-1.14



Fig.LP-1.15

5. *Type* the document name if you want to save the document with a different name. In our case, we have typed **HTMLdoc.html** (Fig.LP-1.16).
6. *Select* the folder where you want to save your file. In our case, it is **HTML files** under the kogent directory (Fig.LP-1.16).
7. *Select* the **Save** button (Fig.LP-1.16).
8. *Open* the Firefox Web browser to view your HTML document (Fig.LP-1.17).
9. *Click* the **File** menu on the Menu bar (Fig.LP-1.17). A drop-down menu appears (Fig.LP-1.17).
10. *Select* the **Open File** option from the drop-down menu (Fig.LP-1.17).

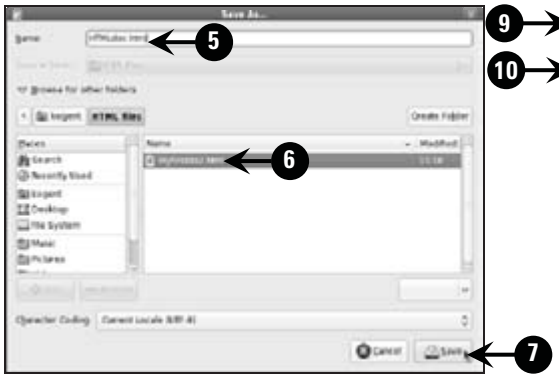


Fig.LP-1.16



Fig.LP-1.17

The **Open File** dialog box appears (Fig.LP-1.18).

11. *Select* an HTML document under the HTML files folder. In our case, we have selected the **HTMLdoc.html** file (Fig.LP-1.18).
12. *Click* the **Open** button (Fig.LP-1.18).

    The Web browser displays the selected HTML document in the Web browser and the created paragraphs (Fig.LP-1.19).



Fig.LP-1.18



Fig.LP-1.19

In the preceding section, you have learned how to create paragraph. Let's now learn to add line breaks in the HTML document.

Adding Line Breaks

While typing the text in your HTML document, sometimes you need to insert a blank line or end a line before it reaches to the right margin of the Web browser. HTML provides the
 tag to break the line. You can apply the
 tag before the line of text from where you want to break it. Perform the following steps to add the line break:

1. *Type* the **
** tag in the body part of the document before the text form where you want a separate the line of text. In our case, we have inserted the
 tag at four locations to break the line (Fig.LP-1.20).
2. *Click* the **Save** button in the toolbar (Fig.LP-1.21).



Fig.LP-1.20



Fig.LP-1.21

3. *Open* the Firefox Web browser. In our case, it is already opened (Fig.LP-1.22).
4. *Click* the **File** menu on the Menu bar (Fig.LP-1.22).
5. *Select* the **Open File** option from the drop-down menu (Fig.LP-1.22).
   The **Open File** dialog box appears (Fig.LP-1.23).
6. *Select* the **HTMLdoc.html** document from the HTML files folder (Fig.LP-1.23).
7. *Click* the **Open** button (Fig.LP-1.23).



Fig.LP-1.22

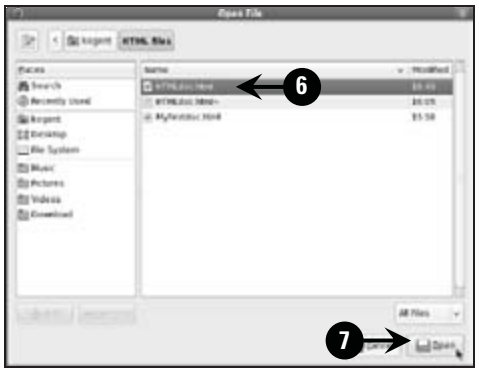


Fig.LP-1.23

We can see in the opened HTML document that the text of the line is broken into four parts, where we have inserted the
 tag. You can see the line of text appears separately in four lines, as shown in Fig.LP-1.24:



Fig.LP-1.24

In the preceding section, you have learned to add line breaks. Let's now learn to create a number list in the HTML document.

Creating Numbered Lists

You can set off the lists of information in your document by using numbers. In a numbered list, numbers are used to give serial numbers to items. A numbered list can help you in organizing information in a structured way. You can apply a numbered list in an HTML document by placing the list of items between opening <OL> and closing tags </OL> respectively. After that, type the <LI> tag before each item of list and the </LI> tag at the end of each item of lists to apply the numbered list in your document.

Perform the following step to create a numbered list in your HTML document:

1. *Type* the **<OL>** tag preceding the text where you want to apply a numbered list (Fig.LP-1.25).
2. *Type* the **<LI>** tag preceding each of the item of list (Fig.LP-1.25).
3. *Type* the **</LI>** tag at the end of each item of list (Fig.LP-1.25).
4. *Type the* **</OL>** tag at the end of the list text (Fig.LP-1.25).
5. *Click* the **Save** button on the toolbar, as shown in Fig.LP-1.25:

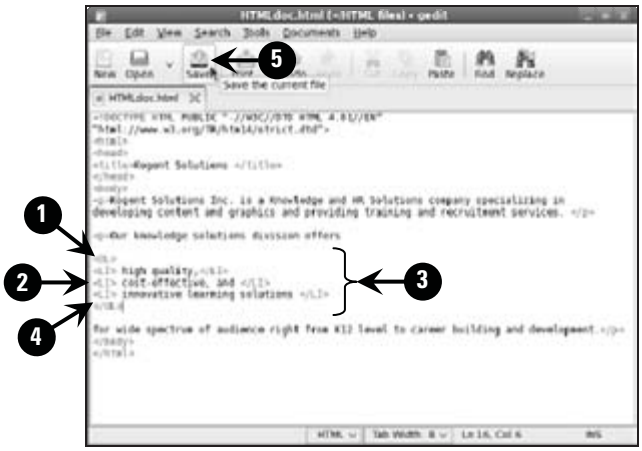


Fig.LP-1.25

6. *Open* the Firefox Web browser and *Click* the **File** menu on the Menu bar (Fig.LP-1.26).
7. *Select* the **Open File** option from the drop-down menu, as shown in Fig.LP-1.26:



Fig.LP-1.26

The **Open File** dialog box appears (Fig.LP-1.27).

8. *Select* the HTML document that you want to display in the Web browser. In our case, it is the **HTMLdoc.html** document under the **HTML files** folder (Fig.LP-1.27).
9. *Click* the **Open** button (Fig.LP-1.27).

   You can view the numbered list applied in the HTML document on the Web browser (Fig.LP-1.28).



Fig.LP-1.27



Fig.LP-1.28

In the preceding section, you have learned to apply a numbered list. Let's now learn to insert an image to the Web page.

Inserting an Image to the Web Page

An image makes your Web pages more descriptive, appealing, and interesting. You can insert an image in an HTML document by using <IMG SRC=" "> tag. The SRC attribute of <IMG> tag is used to provide the name and path of the image that you want to insert into your Web page.

Perform the following steps to insert an image to the Web page:

1. *Type* the **<IMG SRC="/home/kogent/header.jpg">** tag following code in the body part of the editor window in a position where you want to insert an image (Fig.LP-1.29).
2. *Click* the **Save** button present on the toolbar (Fig.LP-1.29).
3. *Open* the Mozilla Web browser (Fig.LP-1.30).
4. *Click* the **File** menu on the Menu bar (Fig.LP-1.30).
5. *Select* the **Open File** option from the drop-down menu (Fig.LP-1.30).

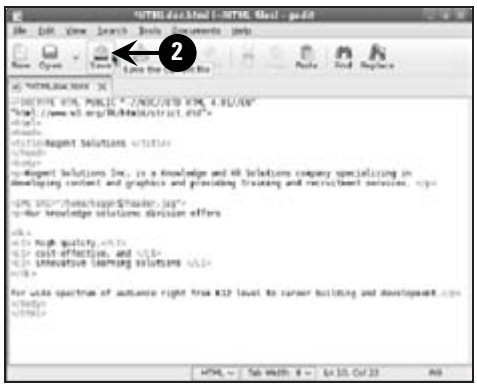


Fig.LP-1.29



Fig.LP-1.30

An **Open File** dialog box appears (Fig.LP-1.31).

6. *Select* the HTML document that you want to display in the Web browser. In our case, it is the **HTMLdoc.html** document from the **HTML files** folder (Fig.LP-1.31).
7. *Click* the **Open** button (Fig.LP-1.31).

   The inserted image in the HTML document is shown in the Web browser (Fig.LP-1.32).



Fig.LP-1.31



Fig.LP-1.32

In the preceding section, you have learned to add an image to the Web page. Let's now learn to add a table in your HTML document.

Adding a Table

A table is a grid of cells with individual cells occurring at the intersection of corresponding rows and columns. You can use tables to present data in an organized fashion. For example, you can add a table to your document to display a list of items or present data in a category.

Perform the following steps to add a table in your HTML document:

1. *Click* the **File** menu on the menu bar in the text editor window (Fig.LP-1.33).
2. *Select* the **New** option from the drop-down menu, as shown in Fig.LP-1.33:



Fig.LP-1.33

3. *Type* the following code provided in Listing 1.3 in the text editor window (Fig.LP-1.34):

Listing 1.3: Showing the HTML Code for Adding a Table

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<title> Employees Details</title>
</head>
<table border="3">
<tr>
<td>Employee's Name</td>
<td>Designation</td>
</tr>
<tr>
<td>Rahul</td>
<td>Technical Writer</td>
</tr>
<tr>
<td>Farheen</td>
<td>Technical Consultant</td>
</tr>
<tr>
<td>Sonal</td>
<td>Reviewer</td>
</tr>
</table>
<body>
<table>
</body>
</html>
```

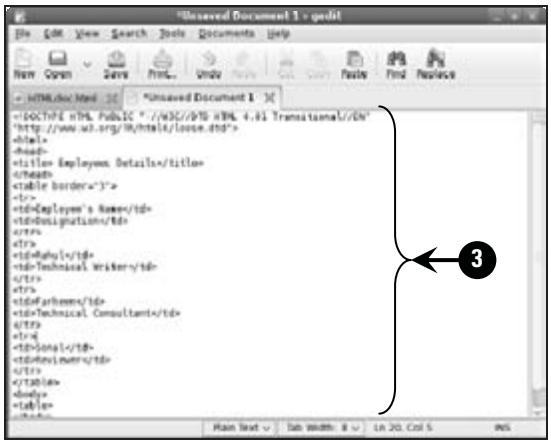


Fig.LP-1.34

4. *Click* the **File** menu and then *select* the **Save As** option (Fig.LP-1.35).
   The **Save As** dialog box appears (Fig.LP-1.36).
5. *Type* the document name in the **Name** text box. In our case, the file name is **HTMLdoc2.html** (Fig.LP-1.36).

6. *Select* a location where you want to save your HTML document. In our case, it is the **HTML files** folder (Fig.LP-1.36).
7. *Click* the **Save** button (Fig.LP-1.36).



Fig.LP-1.35



Fig.LP-1.36

Your document is saved in the selected location. The file name appears on the title bar of the editor window (Fig.LP-1.37).

8. *Open* the Firefox Web browser (Fig.LP-1.38).
9. *Click* the **File** menu on the Menu bar (Fig.LP-1.38).
10. *Select* the **Open File** option from the drop-down menu (Fig.LP-1.38).

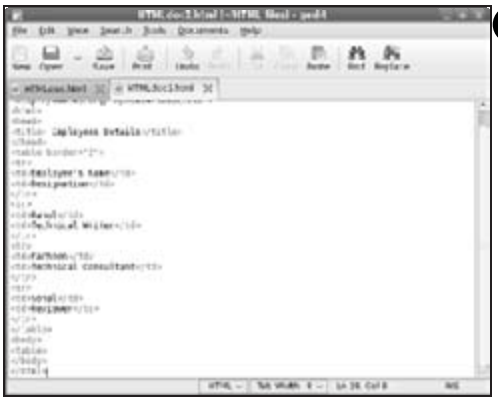


Fig.LP-1.37



Fig.LP-1.38

The **Open File** dialog box appears (Fig.LP-1.39).

11. *Open* the folder where you have saved the HTML document. In our case, it is the **HTML files** folder (Fig.LP-1.39).
12. *Select* the **HTMLdoc2.html** HTML document (Fig.LP-1.39).
13. *Click* the **Open** button, as shown in Fig.LP-1.39:



Fig.LP-1.39

The HTML document is shown in the Web browser, as shown in Fig.LP-1.40:



Fig.LP-1.40

In the preceding section, you have learned to add a table in your HTML document. Let's now learn about hyperlinks.

Working with Hyperlinks

Hyperlink is the reference in a Web page that takes you to some other part of the same Web page or in another Web page. We simply say that it is an electronic connection between two parts of the same Web page or two different Web pages. It may be an underlined word, phrase, or graphics and when we click it, the corresponding Web page opens.

In this section, you learn to create a hyperlink to open another Web page and an e-mail address, as well as use an image as a link.

Creating a Link to Open another Web Page

You can create a link in your HTML document that helps you to navigate from one place to another in a Web page or from one Web page to another. When you provide hyperlinks, a visitor can visit your Web page with just a mouse-click. The <a> tag, which stands for anchor is used to create a link.

In HTML, the syntax to create a hyperlink is as follows:

```
    <a href="URL" >link text </a>.
```

URL refers to Uniform Resource Locator and link text refers to click-able part of the syntax.

Perform the following steps to create a link to open another Web page.

1. *Open* the text editor (Fig.LP-1.37) and *type* the following code provided in Listing 1.4 in the body part of the text editor (Fig.LP-1.41):

Listing 1.4: Code for Creating a Link to Access another Web Page

```
<br>
If you want to visit to Kogent Web site, click the link:
<a href="http://www.kogentindia.com">Welcome to Kogent!</a>
```

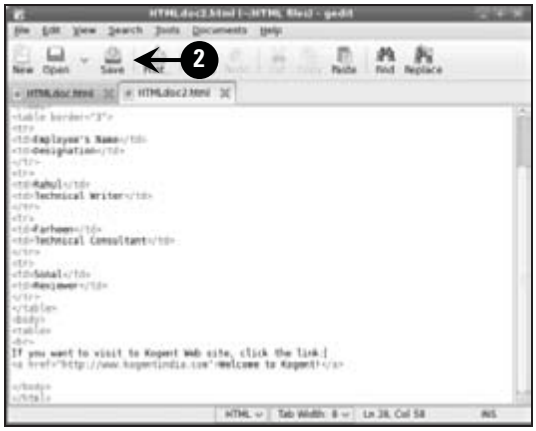


Fig.LP-1.41

2. *Click* the **Save** button (Fig.LP-1.41).
3. *Open* the Firefox browser (Fig.LP-1.42).
4. *Select* the File menu on the Menu bar. A drop-down menu appears (Fig.LP-1.42).
5. *Select* the **Open File** option, as shown in Fig.LP-1.42:



Fig.LP-1.42

The Open File dialog box appears (Fig.LP-1.43).

6. *Select* the file that you want to open in the Web browser. In our case, we select **HTMLdoc2.html** under the **HTML files** folder (Fig.LP-1.43).
7. *Click* the **Open** button, as shown in Fig.LP-1.43:

   The created link in the HTML document appears in the Web page of the browser window (Fig.LP-1.44).
8. *Click* the link to access the linked page. In our case, we have clicked the **Welcome to Kogent!** link (Fig.LP-1.44).

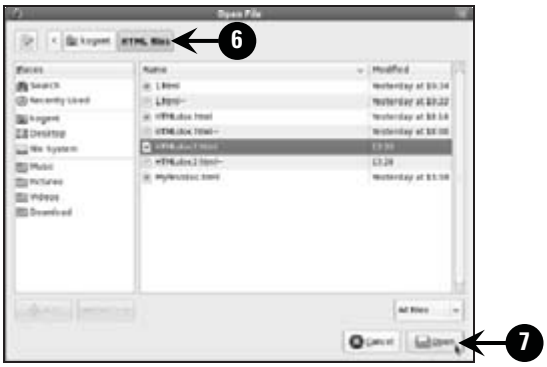


Fig.LP-1.43



Fig.LP-1.44

The corresponding Web page is opened in the browser window, as shown in Fig.LP-1.45:



Fig.LP-1.45

Creating a Link to an E-mail Address

Creating a link to your e-mail address in your Web page provides you a facility to send an e-mail message directly through the Web page. You just need to click the link to e-mail address. It is good practice to provide the e-mail address link so that visitors of your Web site can send you feedback or the queries. The syntax to create a link to an e-mail address is:

```
<a href="mailto:email address">linking text</a>
```

Perform the following steps to create a link to an e-mail address:

1. *Type* the following code provided in Listing 1.5 in the text editor window (Fig.LP-1.46):

Listing 1.5: Code for Creating a Link to Access an E-mail Address

```
<p>You can send e-mail to me at:
<a href="mailto:ram.naresh@kogentindia.com">ram.naresh@kogentindia.com </a>
</p>
```

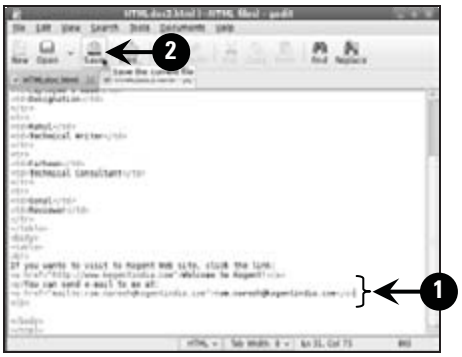


Fig.LP-1.46

2. *Click* the **Save** button on the toolbar (Fig.LP-1.46).
3. *Open* the Firefox Web browser (Fig.LP-1.47).
4. *Click* the **File** menu on the Menu bar (Fig.LP-1.47).
5. *Select* the **Open File** option from the drop-down menu (Fig.LP-1.47).
   The **Open File** dialog box appears (Fig.LP-1.48).
6. *Select* the HTML document that you want to open. In our case, it is **HTMLdoc2.html** under the **HTML files** folder (Fig.LP-1.48).
7. *Click* the **Open** button (Fig.LP-1.48).



Fig.LP-1.47



Fig.LP-1.48

The Web browser displays your HTML document (Fig.LP-1.49).

8. *Click* the link to open the e-mail account, as shown in Fig.LP-1.49:

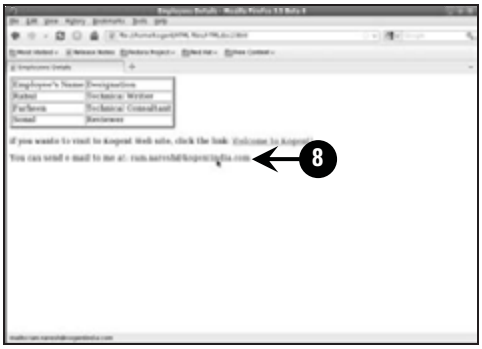


Fig.LP-1.49

The Compose Message window appears, as shown in Fig.LP-1.50:



Fig.LP-1.50

The e-mail address of the recipient appears automatically. You can type the message and subject line and then send it.

Using Image as a Link

Till now, you have used text as a link. You can also use an image as a link. Using an image as a link increases the interactivity of the Web page. Using an image as a link includes some disadvantages, such as it increases the file size for the Web page and editing the image link is more difficult as compared to editing text.

Perform the following steps to use an image as a link:

1. *Select* the **HTMLdoc.html** tab to open the **HTMLdoc.html** document in the text editor window, as shown in Fig.LP-1.51:



Fig.LP-1.51

2. *Type* the following code provided in Listing 1.6 in the text editor window (Fig.LP-1.52):

Listing 1.6: Code for Using an Image as a Link

```
<a href="file:///home/kogent/HTML%20files/HTMLdoc2.html">
<IMG SRC="/home/kogent/arrow.png">
</a>
```

3. *Click* the **Save** button (Fig.LP-1.52).
4. *Open* the Firefox Web browser (Fig.LP-1.53).
5. *Click* the **File** menu on the Menu bar (Fig.LP-1.53). A drop-down menu appears (Fig.LP-1.53).
6. *Select* the **Open File** option from the drop-down menu (Fig.LP-1.53).

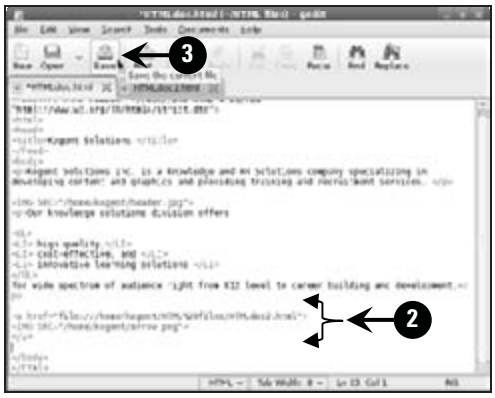


Fig.LP-1.52



Fig.LP-1.53

The **Open File** dialog box appears (Fig.LP-1.54).

7. *Select* the HTML document that you want to view in the Web browser. In our case, we have selected the **HTMLdoc.html** file (Fig.LP-1.54).
8. *Click* the **Open** button (Fig.LP-1.54).

   The HTML document is opened in a Web browser (Fig.LP-1.55).
9. *Click* the image link to open the linked Web page (Fig.LP-1.55).

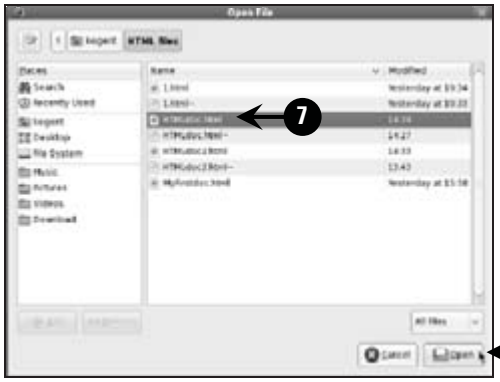


Fig.LP-1.54



Fig.LP-1.55

As soon as you click the image link, the corresponding Web page opens, as shown in Fig.LP-1.56:



Fig.LP-1.56

In the preceding section, you have learned to use an image as a link. Let's now learn to create a frame.

Creating a Frame

Frames allow you to view more than one HTML document in the same browser window. Each HTML document that displays in the browser window is called a frame. All the frames present in the browser window are independent from each other. In the HTML document, we use the <frameset> and <frame> tags. The <frameset> tag is used to specify the division of the window into frames. The <frame> tag is used to specify what HTML documents are putting to be in each of the frame.

Perform the following steps to create a frame:

1. *Click* the **File** menu and *select* the **New** option in the text editor window, as shown in Fig.LP-1.57:



Fig.LP-1.57

A new document is opened in the text editor window (Fig.LP-1.58).

2. *Type* the following code provided in Listing 1.7 in the text editor window (Fig.LP-1.58):

Listing 1.7: Code for Creating a Frame

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<title> Frame Creation</title>
```

```
</head>
<frameset cols="50%,50%">
   <frame src="/home/kogent/HTML files/HTMLdoc.html">
   <frame src="/home/kogent/HTML files/HTMLdoc2.html">
</frameset>
</html>
```

After typing the preceding code, the gedit window appears as shown in Fig.LP-1.58:

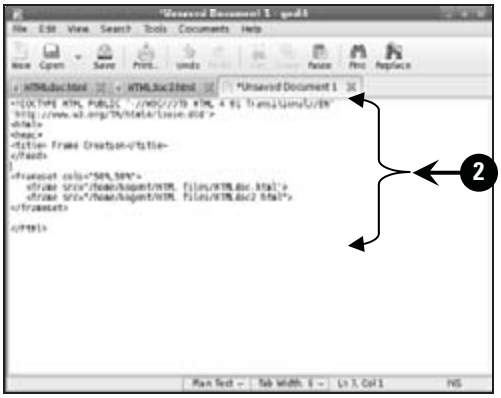


Fig.LP-1.58



If we use <frameset> tag then we cannot use <body> tag

3. *Click* the **File** menu on the Menu bar (Fig.LP-1.59).
4. *Select* the **Save As** option (Fig.LP-1.59).
   The **Save As** dialog box appears (Fig.LP-1.60).
5. *Type* the file name in the **Name** text box. In our case, the file name is **HTMLdoc3.html** (Fig.LP-1.60).
6. *Click* the **Save** button (Fig.LP-1.60).



Fig.LP-1.59

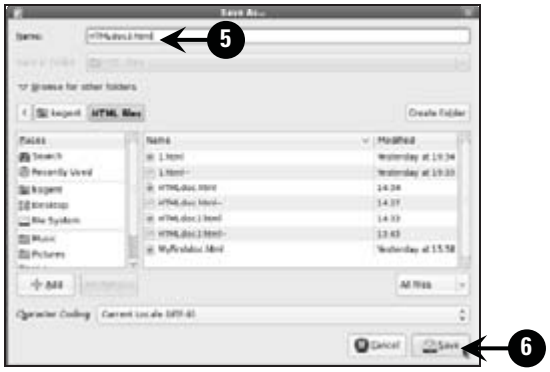


Fig.LP-1.60

The document is saved and the file name appears on the title bar (Fig.LP-1.61).

7. *Open* the Firefox Web browser (Fig.LP-1.62).
8. *Select* the File menu. A drop-down menu appears (Fig.LP-1.62).
9. *Select* the **Open File** option (Fig.LP-1.62).



Fig.LP-1.61



Fig.LP-1.62

The **Open File** dialog box appears (Fig.LP-1.63).

10. *Select* the document that you want to open in the Web browser. In our case, we have selected the **HTMLdoc3.html** file (Fig.LP-1.63).
11. *Click* the **Open** button, as shown in Fig.LP-1.63:

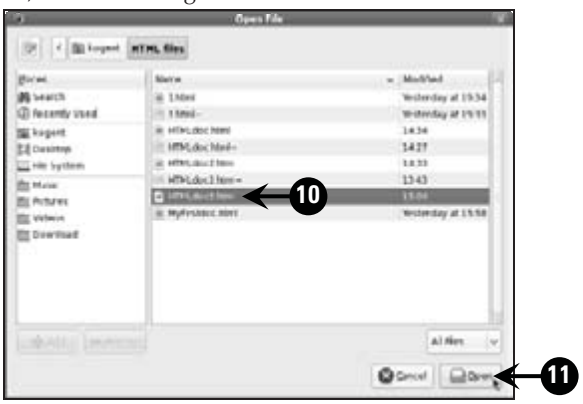


Fig.LP-1.63

The Web browser shows the two HTML documents in the single browser separating with the frames, as shown in Fig.LP-1.64:



Fig.LP-1.64

With this, we come to end of the chapter. Before moving towards to the next chapter, let's summarize the key concepts discussed in this chapter.

Summary

In this chapter, you explored the basic concept of HTML programming including some useful terms, such as Web browser, Web server, and HTML editors that are used in the HTML programming. You also learned the fundamental structure of HTML document. You explored how to create and save an HTML document. After creating the HTML document, you learned to view it in a Web browser. You also explored how to break lines, insert an image in to an HTML document, and create paragraphs and a numbered list to organize the list of items. At the end, you learned to add tables, insert hyperlinks, and create a frame to display more than two HTML documents in the same Web browser.

CHAPTER

2

Linux Shell Programming

In this Chapter:

- Exploring the Linux Shell
- Describing Types of Shells in Linux
- Using Shells in Linux
- Exploring Shell Syntax
- Creating Shell Environment
- Working with Text Editors

Programming, in general terms, is the code to perform a required function by processing the instructions in a sequence. The sequentially arranged group of these instructions is called a program. You can program a function using different programming languages, such as C or Java. In the Linux operating system, you can create a program using the Linux shell. The basic purpose of using the Linux shell for programming is that it is available even with the simplest and basic Linux distribution package. The shell prompt in Linux is much more powerful than the Windows command prompt and thereby is capable of running complex programs on its own. Another advantage of using Linux shell programming is that it allows automatic file type handling; therefore, the users need not know the language in which the utilities are written.

In this chapter, you learn about the Linux shell, its different types and uses. In addition, the chapter explores different shell syntaxes and environments. You also learn to work with different text editors, such as the gedit text editor (the default text editor present in GNU Network Object Model Environment (GNOME) and the Vi Improved (Vim) editor.

Exploring the Linux Shell

The Linux shell is a program that allows a user to interact with the Linux Operating System (OS). It is also referred as Command Line Interface (CLI) The output of a command gets displayed on the shell prompt. Shell is not present in kernel; it only uses the kernel to execute the commands. The kernel is a core component of an operating system, which manages its resources, such as memory and hardware devices. The basic function performed by the Linux shell is to read the command line, interpret the command, and then return the results in the form of output through the monitor.

Shell is a user program or it's environment provided for user interaction. Shell is an command language interpreter that executes commands read from the standard input device (keyboard) or from a file. Linux shell also controls the command process, so that you can set a predetermined sequence to run the commands.

Describing Types of Shells in Linux

Linux is equipped with various shells to perform different types of functions; however, some of the shells even perform similar functions. Every shell in Linux has its specific advantages and disadvantages. The major difference between various shells is in the way they interpret different commands. The following are the major shells in the Linux operating system:

- C shell
- Thomas C (TC) shell
- Korn shell
- Bash shell

The C Shell (csh)

The C shell is developed by Bill Joy and referred to as csh. This shell provides you with various features, such as environment that can be customized according to your requirements, aliases or the abbreviated commands, job control (control programs that can be run in both background or foreground of the command shell), shell scripting, and keyboard shortcuts.

This shell is known as C shell, as its syntax is based on the C programming language. The C shell is the shell type that runs on the Linux operating system, by default. The major difference between csh and other shells is that of the syntax. For example, assigning variable in csh is done by using the following command:

```
"set a = 15"
```

whereas, in case of Bourne shell, the variable assignment is done through:

```
"a = 15"
```

The csh environment can be customized by using the following three files:

- **.cshrc:** Contains commands, variable definitions, and aliases used in C shell

- **.login:** Sets up terminal settings, such as backspace, suspend, and interrupt characters
- **.logout:** Contains commands that are run when a user logs out of the system

The TC Shell (tcsh)

The TC shell is a C shell that provides file name completion and command line editing features. The TC shell is a command line interpreter that is used as an interactive login shell as well as a shell script command processor. It provides features, such as a command-line editor, programmable word completion, spelling correction, a history mechanism, job control, and a C-like syntax.

The Korn Shell (ksh)

The Korn shell is developed by David Korn in early 1980s. It is an interactive command language that provides access to the UNIX system and other systems, on different computers and workstations on which it is implemented. The Korn shell language is high-level language that helps in writing applications easily and quickly as compare to other high-level languages. This makes it especially suitable for prototyping.



Prototyping is a process of building a model of a system to demonstrate some aspect of the intended system.

The Bash Shell

Bash is the acronym for Bourne-again shell that is written for the GNU project and is found as the default shell in most of the operating systems, which are built on top of the Linux kernel. This shell was created in 1987 by Brian Fox. It includes features from the Korn and C shells. Features of the Bash shell include command line editing, command history, job control, aliases, indexed arrays of unlimited size, and integer arithmetic (base ranges from 2 to 64).

After describing different shell types, let's learn to use shells in Linux.

Using Shells in Linux

In Linux, certain items, such as arguments and environment variables are used along with the other commands to perform a different function. The following is the list of the items that can be typed along with the Linux commands to modify their behavior:

- **Options:** Consist of a single letter that is preceded by a dash (-). Options are used to change the behavior of a command. A single or group of commands can be used according to the requirement. For example, the ls -la command lists the contents of the current directory. In case a single option consists of a word instead of characters, the option is preceded by double dashes (--), for example, --help.
- **Arguments:** Refer to an extra piece of information, such as name of the file that is used after the command at the end of a command line. For example, cat /etc/info. In this case, /etc/info is the command argument.
- **Environment variables:** Refer to the place where information is stored for further use. Some environment variables are **$SHELL** (identify the current shell) and **$PS1**(defines shell prompt).
- **Metacharacters:** Refer to characters that perform special functions, such as dollar sign ($) is used to move the cursor to the end of line. Metacharacters can perform functions, such as directing the output of a command to a file (>) or running a command in the background (&).

Let's now learn to locate, rerun, connect, and expand commands.

Locating Commands

The commands in Linux are run either by typing their full or absolute path. However, you must be aware of the directory that contains the command. For example, the date command from the bin directory can be run by typing the following:

```
$ /bin/date
```

The commands are stored in pre-defined directories. The directory containing the command should be added to shell's PATH environment variable. This variable consists of a list of directories. Type the following to get the current path:

```
$ echo $PATH
```

Linux does not check the current directory for the executable file, by default. The commands contained in /bin directory may be used by both the system administrator and by users. However, the /sbin and /usr/sbin directories contains utilities.

Rerunning Commands

Commands can be rerun using the history feature of Linux shell. You can also check the progress of these commands with the help of the history feature. Some of the shell features to rerun commands are as follows:

- **Command line editing:** Enables to edit the command line. This feature helps you to edit that part of the command which is wrongly typed without deleting the entire command line and starting again. By default, Emacs is the editor that is used by the Bash shell. However, the vi editor can also be used to edit the command line. Add the following line to the .bashrc file in your home directory to set the vi editing command shell line editing:

```
set -o vi
```

  The combination of control, meta, and arrow keys are used to do the editing.

- **Command line completion:** Enables you to complete the command line by typing a few characters of the command.
- **Command line recall:** Saves a command in shell's history for future use after the command is typed. Use the history command to view the history list.

Connecting and Expanding Commands

You can expand the commands by combining two or more different commands. The Linux shell provides you with the ability to redirect the output of one command as an input to other command. This can be done by joining the commands with the help of metacharacters. Some of the metacharacters are described as follows:

- **Piping Commands:** Connect the output from one command to the input of other command by using the pipe (|) metacharacter, for example:

```
$ cat /etc/passwd | sort | less
```

  This command lists the contents of the /etc/passwd file and passes the output to the sort command, which takes username that begins on each line as an input and sorts it alphabetically. The resultant output is passed to the less command.

- **Sequential commands:** Enable the commands to run in a sequence. Sequential commands run another command when the first command is completed before the second command begins. The commands can run in a sequence by typing different commands separated by a semicolon (;) on the same command line, for example:

```
$ date ; troff -me verylargedocument | lpr ; date
```

In this example, a large file is formatted. The first command is date that shows the date and time of the formatted file before the formatting started. The troff command formats the document and sends output to printer.

- **Background commands:** Refer to the commands that take time to complete. There are instances when one command waits for another command to get finish. In these cases, when you do not want the shell to be blocked, you can run the commands in the background. You can run these commands at the background by using the ampersand (&) character. An example of background command is:

```
$ troff -me verylargedocument | lpr &
```

- **Expanding commands:** Refer to the commands in which output of a command is interpreted by the shell instead of the command itself. Syntax to expand commands is $(command). An example of the expanded command is mentioned as follows:

```
$ vi $(find /home | grep xyzzy)
```

- **Expanding arithmetic expressions:** Refer to a command in which arithmetic results are passed to a command, for example:

```
$ echo "There are $(ls -l | wc -w) files in this directory."
There are 14 files in this directory.
```

A list of contents of current directory is displayed along with the word count.

Let's explore components of the shell syntax, after learning how to use them.

Exploring Shell Syntax

A shell is a command line interpreter that is used to perform functions, such as file manipulation, program execution, and printing text. You should be aware of the correct syntax which is to be used to have a proper and complete understanding of a shell program.

In the next section, let's discuss the concepts of variables, conditions, control structures, functions, input and output, commands, and command execution.

Variables

A variable represents a memory location, which can be assigned a name and a value. Variables are case sensitive and stored as strings by default, even when they are assigned numerical values. When you want to extract information from a file, a variable is preceded by the $ sign. An input is assigned to the variable by using the read command and contents of a variable are retrieved by using the echo command. This can be illustrated by the following example where we have created a variable named salutation to check its content:

```
read salutation
HOW ARE YOU?
echo $salutation
HOW ARE YOU?
```

Variables are divided into environment variables and parameter variables.

Environment Variables

An environment variable is a named object that contains information used by one or more applications. The difference between these and user-defined variables is that environment variables are generally in upper case while those defined by the user are in lower case.

Table 2.1 lists some of the major environment variables:

Table 2.1: Environment Variables

Environment Variable	Description
$HOME	Displays the home directory of the current user.
$PATH	Displays a colon-separated list of directories to search for commands.
$PS1	Refers to a command prompt, which uses the $ sign.
$PS2	Refers to a secondary prompt that is used when prompting for additional input; usually >.
$IFS	Refers to an input field separator. It displays a list of characters which are used to separate words.
$0	Refers to the name of shell script.
$#	Refers to the number of parameters passed.
$$	Refers to the process ID of the shell.

Now, let's explore parameter variables.

Parameter Variables

Parameter variables are variables that are created when parameters are passed as inputs in the script. In case, when no parameter is passed, environment variable ($#) exists with a value of 0 (zero).

Table 2.2 lists some parameter variables:

Table 2.2: Parameter Variables

Parameter Variable	Description
$1, $2, $3, ...	Refers to the parameters given to the script
$*	Refers to the list of all the parameters in a single variable, which are separated by the first character in the IFS environment variable
$@	Refers to the variation of the $ command and does not require the IFS environment variable

After describing variables, let's discuss conditions used in Linux.

Conditions

Conditions are the statements that check whether a specified set of actions is performed by a command or not. These actions are based on the decisions taken by the user, for example, the test command. This command checks for the file types and compare values. Syntax for the test command is as follows:

```
test EXPRESSION
[ EXPRESSION ]
test OPTION
DESCRIPTION
```

The test command takes three condition types: string comparison, arithmetic comparison, and file conditionals. Some of the condition types that can be used with the test command are listed in Table 2.3:

Table 2.3: Condition Types

String Comparison	Result
string1 = string2	Returns true if the strings are equal
String1 != string2	Returns true if the strings are not equal
-z string	Returns true if the string is empty
Arithmetic Comparison	**Result**
expression1 -gt expression2	Returns true if expression1 is greater than expression2
expression1 -le expression2	Returns true if expression1 is less than or equal to expression2
! expression	Returns true if expression is false, and vice versa
File Conditionals	**Result**
-f file	Returns true if the file is the regular file
-u file	Returns true if set-user-id is set on the file
-x	Returns true if the file is executable

Control Structures

Control structures refer to the instructions, statements, or a group of statements that control the sequence in which the commands should be executed. In other words, the flow of commands (the direction to perform an action) is called a control structure. Some of the control structures are as follows:

- **if:** Tests the results of a command and then conditionally executes a group of statements. Syntax for the if command is as follows:

```
if condition
then
    statements
else
    statements
```

- **for:** Refers to a loop execute through a range of values is present in a variable. This value range can be any set of strings. Syntax for the for command is as follows:

```
for variable in value
do
    statements
done
```

- **while:** Enables the user to repeat a sequence of command when the number of command execution is not known before the execution starts. Syntax for the while command is as follows:

```
while condition do
statements
done
```

Let's now discuss the functions used in the shell syntax.

Functions

Function refers to a group of commands that performs a single operation. The syntax to define a function is:

```
function_name () {
    statements
}
```

In this example, function_name is the name of the function created by the user and statements are the instructions that are executed by the function.

Input and Output

Commands in Linux treat the available input and output as the standard input (stdin) and the standard output (stdout). Input entered through the keyboard is the stdin and output displayed on the computer screen refers to as stdout, by default.

Input redirection refers to the process when you want a file to be treated as an input for a command. This can be done by using less than symbol (<) operator, as shown in the following example:

```
sort < myfile.txt
```

In this case, the myfile.txt file is treated as an input command.

Output redirection takes place when output of one command is treated as an input for a second command or in situations when you want to save output of a command in a file. You can redirect output by using greater than symbol (>) or pipe (|) operator. An example of output redirection is as follows:

```
$ ls > dir_listing.txt
```

In the preceding example, output of the ls command is redirected to a file called dir_listing.txt.

Commands

Commands are the sets of instructions that are used to perform specific functions. There are two types of commands, such as internal and external commands. Internal commands are built-in commands, which are implemented internally into the Bash shell, for example the exit command. External commands are those that can also be run from the command prompt, such as /bin/ls command. Basic difference between these two types of commands is that unlike external commands, internal commands cannot run as an external program. Some of the commands are briefly described as follows:

- **break command:** Enables you to escape out from a loop, such as for, while, or until loop, before a condition is satisfied.
- **colon (:) command:** Refers to a null command, which is used as an alias for the true option. The : command is also used for conditional setting of variables, for example, : ${var:=value}. If : is not present, $var gets evaluated as a command by the shell.
- **Dot (.) command:** Executes the command in the current shell.
- **echo command:** Provides the output of a string followed by a newline character.
- **eval command:** Enables you to evaluate arguments.
- **expr command:** Evaluates arguments as an expression.
- **shift command:** Moves all the parameter variables down by one. For example, $2 becomes $1 or $3 becomes $2.

Let's now learn about command execution.

Command Execution

Command execution is a process that lets you capture the output of a command and assign this output to a variable. The syntax to capture and assign the output to a variable is as follows:

```
$(command)
```

Consider the following code snippet to understand the working of the $ (command):

```
#! /bin/sh
echo The current working directory is $PWD
echo The currently login users are $(who)
exit 0
```

In the preceding code snippet, the current directory refers to the shell environment variable. The output of the current directory can be assigned to a variable as follows:

```
currentUsers= $(who)
echo $currentUsers
```

In the next section, let's learn to create programs in a shell.

Creating Shell Environment

A shell environment can be modified according to the requirement of the user. Whenever the ENTER key is pressed by the user at the command prompt, information specific to that command is displayed on the shell prompt. You can also set the environment variables and the key combinations according to your requirement. All these changes are made into the configuration file of a shell.

Let's now learn how to customize a shell prompt.

Setting Shell Prompt

A shell prompt refers to a text-based user interface present in a shell, which acts as a command line interpreter. You see the **$** sign if you are logged in as a general user or a **#** sign if you are logged in as a root user. Various special characters can be used to include the information on the shell prompt according to the requirement of the user.

Table 2.4 lists some of these special characters that are used to add information to your command prompt:

Table 2.4: Special Characters

Special characters	Description
\\	Shows a backslash
\n	Causes a newline character
\[	Precedes a sequence of non-printing characters

Table 2.4: Special Characters	
Special characters	**Description**
\]	Follows a sequence of non-printing characters
\$	Shows the user prompt ($) or root prompt (#), depending on the type of user
\u	Prints your current username
\w	Displays the full path to current working directory

Let's now learn to configure a shell.

Configuring a Shell

The configuration of shell files lets you control the behavior of a shell. Some of the files and commands are general for each user and shell, while some of them are specific according to each user. Table 2.5 lists some configuration files that are used in Bash:

Table 2.5: Bash Configuration Files	
File	**Description**
.bashrc	Contains a list of commands that are executed every time when a shell gets open.
.bash_profile	Refers to the commands specific to each user that are executed when you log in.
.bash_history	Refers to the commands that are previously typed and are stored in the history of the bash shell.
.bash_logout	Refers to the commands that are executed when you log out of the shell. By default, the screen gets cleared.

You should be a root user if you want to change the .bashrc or .bash_profile files. You can make changes in your home directories.

Let's now learn to add environment variables.

Adding Environment Variables

You can add environment variables to the .bashrc file as per the requirement of the user. The .bashrc file lets you work with shell in a better, efficient, and effective way. Some of the environment variables that can be added to the .bashrc file are as follows:

- **TMOUT:** Sets the time duration for the shell to remain inactive before it automatically exits. This time duration is set in seconds. For example, if you want the idle time for automatic exit of the shell to be of 30 minutes, then you can set the value as TMOUT=1800. Idle time refers to the time period for which the shell remains idle and does not perform any function.
- **PATH:** Sets the directories that are generally searched for commonly used commands. If PATH does not consist of directories of command, then you can add these directories permanently to the .bashrc file. For example, if you want to add a directory /data/firstscript in the beginning of the PATH environment variable, then type:

```
PATH=/data/firstscript:$PATH
```

If you want to add directory at the end, then type:

```
PATH=$PATH:/data/ firstscript
```

- **WHATEVER:** Helps to create environment variables that provide shortcuts to your work. You can create these shortcuts with any name and then assign a value to it.
- **HOME:** Sets the home directory. If you want to set your home directory as /home/kogent, then type:

```
HOME=/home/kogent
```

Let’s now learn how to set the environment variables after adding them.

Setting Environment Variables

Environment variables can also be set according to your requirements. The setting of environment variables can be either temporary or permanent. If you want to set an environment variable temporarily, then type a variable name and assign it a value. In this case, we are setting the ANT_HOME environment variable to the directory where the ant_dir directory is installed, as shown by the following syntax:

```
export ANT_HOME=${ant_dir}
```

A major drawback of temporary settings is that these settings are lost as soon as you exit from the shell. You can also set your environment variables permanently to overcome this problem. Permanent setting of environment variables is done in the Bash configuration file.

Adding Aliases

An alias refers to the assumed name of a command, directory, or a filename. A small combination of a string of characters can execute an entire command line with the help of aliases. Alias refers to lines written in the Bash file and are assumed to be variation of a command. Any number of aliases can be made using the alias command. Some examples of aliases are as follows:

```
alias rm='rm -i'
alias mv='mv -i'
alias p= 'pwd'
```

In the first example, rm is used to remove or delete a command and the -i option is known as interactive, which confirms any action. In this example, rm is created as an alias that runs rm -i command. Second example is same as that of first, the only difference between these two command lines is that instead of rm, mv is used. The mv command is used to move a file to a different location. Next, in the last example, the alphabet p is assigned to run the pwd command. The aliases that are set can be checked by typing the alias command in the shell. An alias can be removed by typing the unalias command.

Till now, you learn about the shell environment, further let's explore the Vi editor.

Working with Text Editors

A text editor is an application used to prepare the text document. It has features, such as adding, removing, replacing, finding text, undo and redo, or text formatting. Text editors edit and modify the text files only. Some of the commonly used text editors in Linux are described in Table 2.6:

Table 2.6: Linux Text Editors

Text Editors	Description
gedit	Refers to the default GUI text editor for the GNOME desktop environment.
Vim	Refers to the cross-platform, which are highly flexible and supports plug-ins.
Nano	Refers to the popular, lightweight, and streamlined text editor.
Kate	Refers to the default text editor in KDE, which can be used as an Integrated Desktop Environment (IDE).
Emacs	Refers to the extensible and customizable text editor that provides content-sensitive editing modes and unicode support.
Geany	Refers to the editor that uses GTK2 toolkit, supports multiple file formats, and also provides options for configuration according to the requirement.
Scribes	Refers to the text editor present in GNOME with simple interface. It consists of various features, such as detecting, highlighting, and auto-completion.
EmEditor	Provides simple programming features, such as syntax highlighting, tabs, and plug-ins.
jEdit	Refers to the editor in which IDE is written in java, which is used for auto-indentation, character encoding, and bracket matching.
Leafpad	Refers to the text editor built in GTK and resembles Notepad. This editor consists of the printing feature.

Let's now learn how to use the gedit text editor.

Using the gedit Text Editor

The gedit text editor is the default text editor that comes with GNOME desktop environment. It is the simplest text editor. You can configure syntax highlighting options, undo/redo, UTF-8 file format support, auto indentation, text wrapping, file reverting, print and print preview support, or back up file. You can also customize configurable fonts and colors, line numbers, and search and replace options.

Perform the following steps to open the gedit editor:

1. *Click* the **Applications** menu (Fig.LP-2.1). A drop-down menu appears (Fig.LP-2.1).
2. *Place* the mouse-pointer on the **Accessories** option (Fig.LP-2.1). A sub-menu appears (Fig.LP-2.1).
3. *Select* the **Text Editor** option, as shown in Fig.LP-2.1:

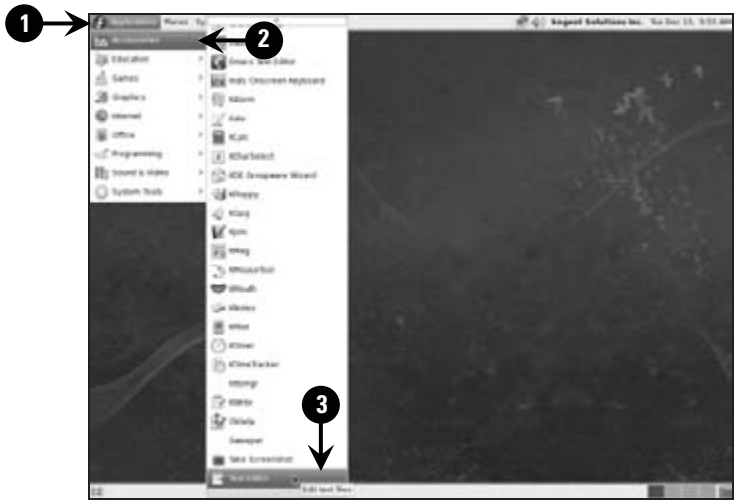


Fig.LP-2.1

A gedit window appears, as shown in Fig.LP-2.2:

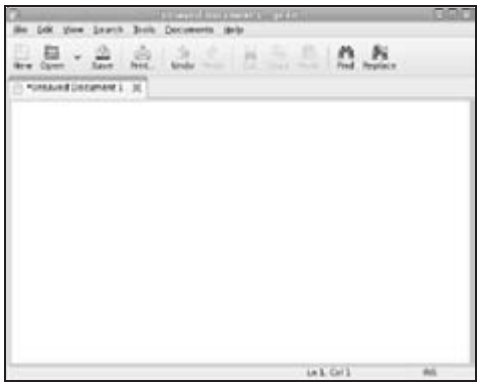


Fig.LP-2.2

In the next section, let's now learn how to use the Vim text editor.

Using the Vim Text Editor

The Vi Improved editor referred as Vim text editor is the improved version of the Vi text editor and is freely distributed. The basic purpose of using text editors is editing the configuration files. These

configuration files are present in text file format. You can add or insert text, change text, or delete text by using the Vim commands.

The Vim editor has two different modes, namely command mode and insertion mode. These modes are briefly described as follows:

- **Command mode:** Lets you enter commands. It is the default mode in which the Vim editor opens. The command mode is also referred as the regular mode.
- **Insertion mode:** Lets you insert text. You can switch to insertion mode from regular mode by pressing the i key from your keyboard.

Next, let's explore the basic commands that are used to work with the Vim text editor.

Table 2.7 shows different commands and their brief descriptions to start the Vim text editor:

Table 2.7: Start Command

Command	Description
vi filename	Edits file with the specified filename beginning from line 1
vi +n filename	Starts editing from n line of file
vi + filename	Starts editing from the last line of file
vi -r filename	Recovers file when a system crashes

Table 2.8 lists the commands to save a file:

Table 2.8: Save Command

Command	Description
:w	Saves the current file
:w filename	Saves the current file with a different name

Table 2.9 lists the commands to quit from the Vim editor:

Table 2.9: Quit Command

Command	Description
ZZ	Saves the current changes and exits from Vim
:q	Quits Vim
:q!	Quits Vi without saving changes
:wq	Saves the file and quits Vim

Table 2.10 lists the commands to move the cursor in the file:

Table 2.10: Cursor Command

Command	Description
h	Moves the cursor one character towards left
l	Moves the cursor one character towards right
k	Moves the cursor up one line
j	Moves the cursor down one line
w	Moves the cursor to the beginning of the next word
b	Moves the cursor to the beginning of the previous word
(	Moves the cursor to the start of the sentence
)	Moves the cursor to the end of the sentence

Table 2.10: Cursor Command	
Command	**Description**
{	Moves the cursor to the start of the paragraph
}	Moves the cursor to the end of the paragraph
H	Moves the cursor to the first line on the screen
M	Moves the cursor to the middle line on the screen
L	Moves the cursor to the last line on the screen

Table 2.11 lists the Vim commands that are used to delete the text:

Table 2.11: Delete Command	
Command	**Description**
x	Deletes the character afterhe cursor
X	Deletes the character before the cursor
dw	Deletes word under cursor
db	Deletes word before cursor
dd	Deletes the entire current line
d0	Deletes character from the beginning of current line
d$	Deletes character from the end of current line

Let's now learn how to insert text in a file.

Inserting Text in a File

Let's perform the following steps to insert text in a file through the Vim editor:

1. *Click* the **Applications** menu. A drop-down menu appears (Fig.LP-2.3).
2. *Place* the mouse-pointer on the **System Tools** option. A sub-menu appears (Fig.LP-2.3).
3. *Select* the **Terminal** option, as shown in Fig.LP-2.3:

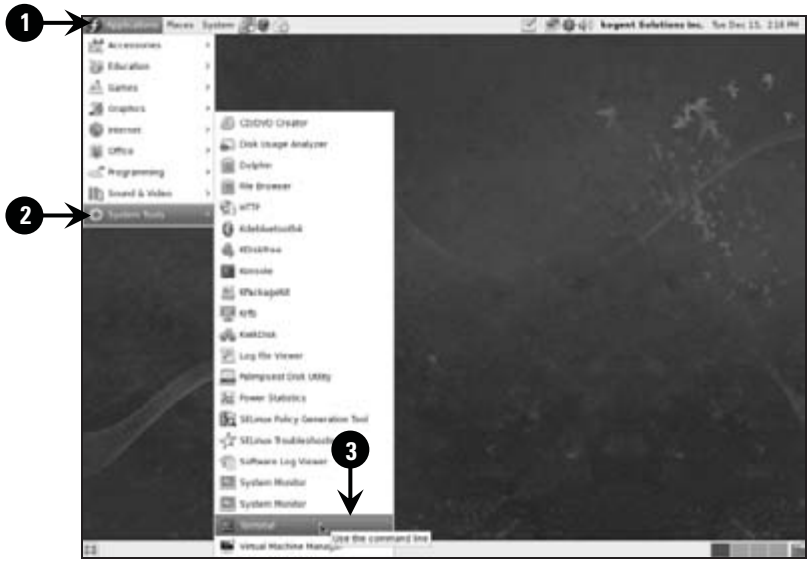


Fig.LP-2.3

A Terminal window appears, as shown in Fig.LP-2.4:



Fig.LP-2.4



You can switch from the local user ($) to the root user (#) with the help of the su – command. In our case, we have logged in as the root user, as shown in Fig.LP-2.4

4. *Type* vim filename at the command prompt. In our case, we have typed **first** as the filename (Fig.LP-2.5).
5. *Press* the **ENTER** key. The file gets open in the Vim text editor (Fig.LP-2.6).

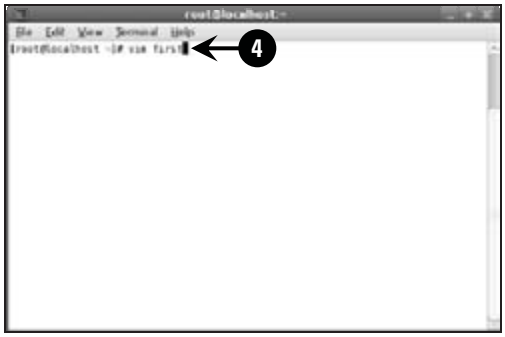


Fig.LP-2.5



Fig.LP-2.6



If the file exists, then the first page of the file is displayed; otherwise, an empty file and screen are created into which you can enter text.

6. *Press* the **INSERT** key to enter the text. In our case, we have *typed* hello world, as shown in Fig.LP-2.7:

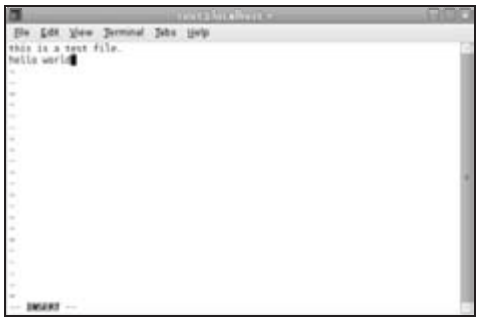


Fig.LP-2.7



You can also switch to the Insert mode by pressing the i key from your keyboard to insert text in file.

After insertion of new text, let's learn to save and quit from the Vim editor.

Saving the File and Quitting the Text Editor

Perform the following steps to save your file and quit from the Vim editor:

1. *Press* the **ESC** key to switch to command mode to save the file. You can see that the Insert mode disappears (Fig.LP-2.8).
2. *Type* **:w** to save the current file (Fig.LP-2.9).

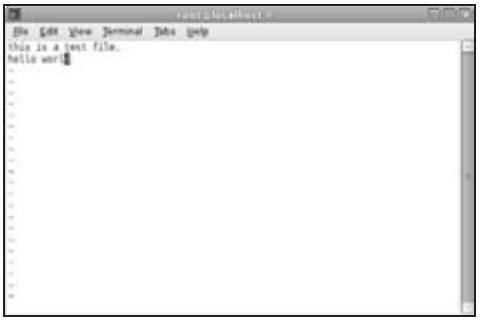


Fig.LP-2.8

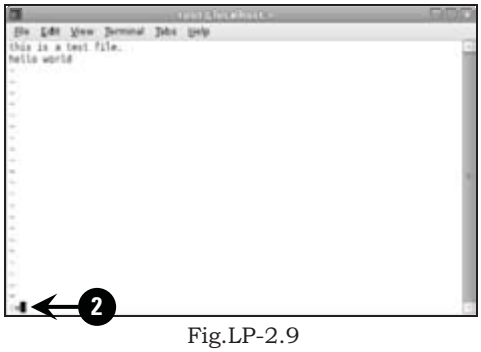


Fig.LP-2.9

3. *Press* the **ENTER** key. The changes made in the file are saved (Fig.LP-2.10).
4. *Type* **:q** to quit from the Vim editor (Fig.LP-2.11).

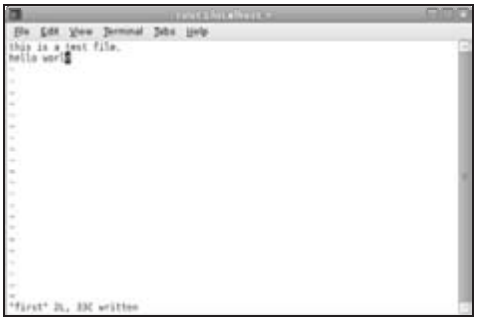


Fig.LP-2.10

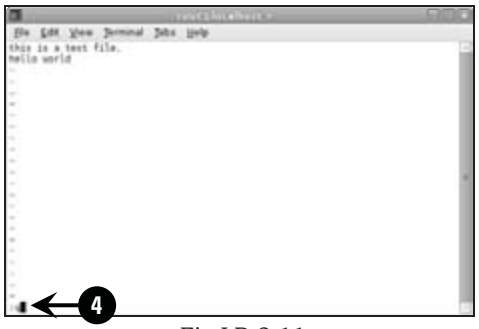


Fig.LP-2.11

5. *Press* the **ENTER** key. The Terminal window reappears, as shown in Fig.LP-2.12:

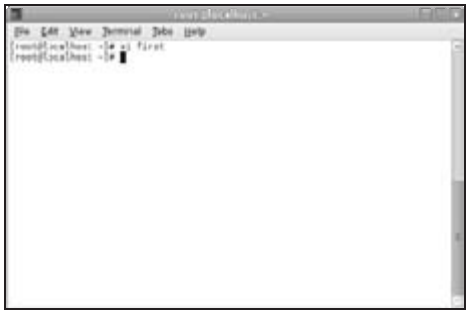


Fig.LP-2.12

With this we come to the end of this chapter, let's summarize the key points in the following section.

Summary

In this chapter, you have learned about different types of shells used in the Linux operating system and their uses. The chapter also explores the structure of the shell syntax. Next, you learned how to create a shell environment and work with various text editors, such as gedit and Vim.

CHAPTER

3

Introduction to C Programming

In this Chapter:

- Exploring the Features of C Programming
- Exploring the Concepts used in C Programming
- Writing the First C Programming
- Compiling and Executing a C Program in Linux
- Exploring C Operators

A computer can not understand a language, such as English. So, while communicating with it, you need a language that your computer can understand. A Programming language fulfills this requirement. A computer programming language is a language that is designed to instruct a computer to perform some specific tasks. You have heard about different programming languages, such as C, C++, and Java. Each programming language has its own rules, and features. C programming language is developed by Dennis Ritchie at AT & T's Bell Laboratories of USA in 1972. Today, there are so many programming languages but still the popularity of C is not less. The reason is that C is the most basic programming language and to understand the programming languages, such as C++, Java, and C#, you first need to understand the basic elements of a language that C contains. You can migrate to any of the other languages if you know C language thoroughly.

In this chapter, you explore the features of C programming. You also explore the basic concepts used in C programming, such as constants, variables, and data types. You learn to create, and save a C program and then you learn to compile and execute it. Finally, you learn the operators used in C programming.

Exploring the Features of C Programming

C programming is a structured programming language. In structured programming language, the programmer logically divides the source code into small, and manageable control flow blocks, such as statements, loops and functions. It is also called a general-purpose programming language. The C programming language is easy to understand, easy to use, and portable. Portable means, a program written in C can run on different machines. The performance in terms of speed of execution, of a C program is faster than the other programming languages. The C language is used to develop system software, such as operating systems, and compilers. The popular operating system, such as Windows, Unix, and Linux are written in C language. The various application softwares, such as graphics packages, and spreadsheets are developed in C language.

In the preceding section, you have learned features of C programming. Let's now learn the basic concepts used in C programming.

Exploring the Concepts used in C Programming

Before writing a C program, you need to understand some basic concepts that are used while writing a program. For example, a programming language uses special symbols, variables, keywords, rules to use them in a program, so you need to understand the use of such terms. The basic concepts used in C programming are:

- Constants and variables
- keywords
- Data types
- Comments
- The printf() and scanf() function

Let's start with constants and variables.

Constants and Variables

A constant is an entity that does not change during the execution of a program. There are mainly four types of constants in C:

- **The integer constant:** Represents a whole number. It displays a sequence of digits without any decimal point.

  Examples of integer constants are 240, 1.
- **The floating-point constants:** Represents a number that has a decimal point. It displays a sequence of digits preceded and followed by a decimal point

  Examples of floating-point constants are 0.0007, 52.0.
- **The character constants:** Represents a single character enclosed within a pair of single quotes. Examples of character constants are ‘n’, ‘!’, ‘C’, ‘ ’ (blank space character).

- **The string constants:** Represents a sequence of characters enclosed within a pair of double quotes. Examples of string constants are "Hello", "2009", " y + 4".

A variable is an entity whose value changes during the execution of a program.

Variables in C are memory locations that are given names and can be assigned values.

Variables are also called identifiers.

Examples of variable names are age, name, address, marks, and area.

While providing variable names, follow the following naming conventions for identifiers:

- Use a proper variable name to indicate the data it stores.
- Use an alphabet or an underscore (_) as the first character of a variable name and all the succeeding characters as letters and digits.
- Use lowercase variable names in C. However, you can also use both uppercase as well as lowercase variable names.
- Do not use commas, blank spaces, keywords, and special characters to name a variable.

Now, let's learn how to declare a variable.

Declaring Variables

In a C program, prior to using a variable, you must first declare it. You should declare a variable so that some amount of memory is already reserved for a variable. The syntax for declaring a variable in C is as follows:

```
data_type variable_list;
```

where,

- **data_type:** Refers to a built-in data type such as int, char, float, or double.
- **variable_list:** Refers to a list of one or more variables of data type data_type. In case there is more than one variable, then they must be separated by commas.

You must always remember to terminate a variable declaration by a semicolon (;). Following are the examples of declaring variables:

```
int age;
float diameter;
char chr;
double salary;
int a, b, c;
float arr[34];
char marks[10], color[4];
```

Now, let's see how a value is assigned to a variable.

Initializing Variables

Once you have declared a variable, the next step is to assign a value to that variable. The process of assigning a value to a variable is called as initialization of a variable. As you know, the variables hold some memory location where the data is actually stored. You can assign a value to a variable by using the (=) assignment operator. The syntax for initializing a variable is as follows:

```
variable_name = value;
```

where,

- **variable_name:** Refers to the name of the variable where the value is actually stored
- **=:** Refers to the assignment operator
- **Value:** Refers to the value that is used to initialize the variable

You can initialize a variable by using two methods. In first method, you can specify an initial value to a variable within the declaration part itself. In the second method, the initial value is assigned to the variable in the execution section of the C program. When you initialize a variable within the declaration

part, it is called initialization. In this case, you must specify a data type when you declare and initialize the variable. Following are some examples of declaring and initializing a variable using a single statement:

```
int y=3;
float salary=0.0;
char chr='A';
double y=0.1362;
```

Now, let's learn about the keywords used in C programming.

Keywords and Identifiers

Keywords are reserved words that cannot be used while naming a variable or function. In other words, keywords are the words having special meaning to the C compiler. While specifying a legal identifier, you must keep in mind the C keywords. Table 3.1 lists some of the keywords of the C language along with their description:

Table 3.1: Describing Keywords of C

Keyword	Description
char	Refers to a data type that holds character/characters
const	Allows to define constants
continue	Sends control back to the top of a loop
do	Starts a do-while loop
else	Indicates an alternative branch in the if statement
float	Represents a single precision floating point data type
for	Provides iteration facility repeatedly
goto	Allows to jump the control from one part of program to another
if	Allows to execute specified statements if the specified condition is true
int	Refers to a data type that holds integer type values

Identifier is the term used to name variables, functions, labels, enums, structures or unions. You can use alphabetic characters, 10 digits (0-9), and underscore (_) to construct identifiers. You must start with an alphabetic character while using identifiers.

For example, we declare an integer type variable named as age:

```
int age;
```

In the preceding example, age is identifier for integer variable.

Let's now learn data types used in C programming.

Data Types

A data type defines the type of data that is stored in a variable. The data in a variable can be either numeric or string. A data type determines how much storage space should be allocated to a variable. C has some built-in data types for which the programming language offers built-in support. The built-in data types are also called basic or primary data types. Table 3.2 lists the built-in data types supported by C:

Table 3.2: Built-in Data Types in C

Types	Data Type (Keyword)	Description	Size (in Bytes)
Character	char	Stores a single character	1
Integer	int	Stores whole numbers	2

Table 3.2: Built-in Data Types in C			
Types	**Data Type (Keyword)**	**Description**	**Size (in Bytes)**
Real (floating-point)	float	Stores real numbers that has single-precision floating-point	4

Now, let's discuss each of the built-in data types of Table 2 in detail.

The char Data Type

The char data type is used to store character type data. A char data type takes 1 byte for storage. It can store data that can be either a character constant or a string constant.

A character constant is a single character enclosed within single quotes. For example 'A', 's', '@', '4'and text enclosed within double quotes is called a string constant, such as "kogent", "ABC".

The int Data Type

The int data type is used to store whole numbers, which are a set of non-negative integers including 0. The range of an int data type depends on the word length defined for a compiler.

The float Data Type

The float data type is used to store real numbers that have a single-precision floating-point. Floating-point numbers are numbers that contain a decimal point either to the left or to the right of an integer. These numbers can be expressed in decimal notation.

Comments

Comments are statements that are used for short explanation within the source code. Comments do not change the behavior of a program. This part is completely ignored by the C compiler. In C programming, double slash (//) are used for single line comment and, you can type text between the symbols /* and */ for multi-line comment. Following are the examples of single and multi- line comments:

```
// This is a single line comment
/*This is a
  Multi-line
   comment */
```

Now let's learn about printf() and scanf() functions.

The printf() and the scanf() function

The printf() function is used to display information on the screen. This function returns the number of characters printed, or a negative value if an output error occurs.

The syntax for printf() function is:

```
printf("control character", variable_list);
```

where,

- **control character:** Determines the type and format of the values to be displayed.
- **variable_list:** Refers to the list of variables that you want to display.

Let's see some examples where, we have used the printf() function:

```
printf("kogent learning solution");
printf("%d", var1);
printf("%f %f", m, n);
printf("Sum of four numbers are=%d", sum);
printf("\n A=%d, B=%d", a, b);
```

First statement displays the text enclosed within double-quotes.

Second statement displays the value of var1 variable.

Third statement displays the value of variables m and n.

Fourth statement displays the message and then displays the value of sum variable next to it.

Fifth statement displays the value of variables a and b next to A= and B=.

The scanf() function is a formatted function in C that is used to read information from standard input device, such as keyboard. The scanf() function is used to enter the numeric that contains the first string argument and it may have additional arguments. The additional arguments must be pointers (to implement call by reference).

The syntax for scanf() function is as follows:

```
scanf("control character", address_list);
```

Where,

- **control character:** Refers to a sequence of one or more control characters. Control character decides the type of value that need to be provided to the variables. Control characters are preceded by a % sign.
- **address_list:** Determines the address of memory locations where the values of input variables should be stored.

Following rules should be kept in mind before using the scanf() function:

1. A pair of double quotes is used within the control character.
   For example:
```
scanf("%d", &b);
```
2. For every input variable, there must be a control character.
   For example:
```
scanf("%d %d %d", &m, &n, &p);
```
3. Multiple numbers of character groups can be allowed within the control character.
   For example:
```
scanf("%d %f %c", &a, &b, &c);
```
4. Use ampersand (&) symbol followed by the input variable in the address_list.
   For example:
```
scanf("%c", &a);
```
5. Use commas to separate input variables.
   For example:
```
scanf("%f %d", &m, &n);
```
6. Use comma to separate control characters and address_list.
   For example:
```
scanf("%u %x", &var1, &var2);
```

After exploring the basic concepts used in C programming, now let's learn to write a program in C.

Writing the First C Programming

Now, you have learned the basic concepts used in C programming, you can write a simple program.

For writing a C program, you need a text editor. In Fedora, gedit is the default text editor. Listing 3.1 shows a simple program in C that displays a message:

Listing 3.1: Showing a Simple C Program

```
#include <stdio.h>
/* prints Welcome to ABC World on standard output */
int main() {
printf("Welcome to ABC World\n");
return 0;
}
```

Listing 3.1 consists of the following code statements:

- **#include <stdio.h>:** Refers to the preprocessor statement used for standard input/output functions. A preprocessor statement starts with the hash (#) symbol and directs the C preprocessor to include the header files in a C program.
- **/* */:** Represents the comment line, which starts with /* and ends with */. These comment lines are used to provide additional information about a program.
- **main():** Refers to the function from where the execution of a program begins. Within the main() function, you can declare variables or provide expressions or statements, depending upon the requirement of your program. For example, in Listing 1, we have used the printf() function to print the welcome message for C programmers. A return statement terminates the execution of the function. You must enclose the code of the main() function within curly braces ({ }).

Perform the following steps to write the program provided in Listing 1 in a text editor:

1. *Select* **Applications→Accessories→Text Editor** (Fig.LP-3.1).
   A gedit window appears with a blank text file (Fig.LP-3.2).

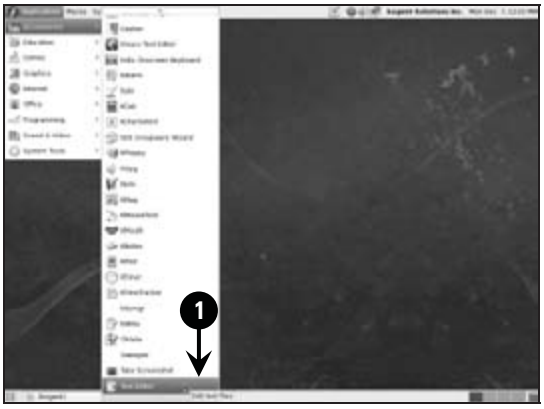


Fig.LP-3.1



Fig.LP-3.2

2. *Type* the code provided in Listing 1 (Fig.LP-3.3).
3. *Click* the **File** menu. A drop-down list appears (Fig.LP-3.4).
4. *Select* the **Save As** option from the drop-down menu (Fig.LP-3.4).

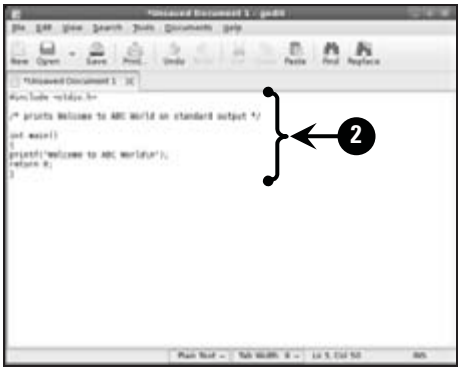


Fig.LP-3.3



Fig.LP-3.4

   A **Save As** dialog box appears (Fig.LP-3.5).
5. *Type* the file name in the **Name** text box along with .c file extension. In our case, the file name is **Hello.c** (Fig.LP-3.5).
6. *Select* a location where you want to save your file. In our case, it is **kogent** folder (Fig.LP-3.5).

7. *Click* the **Save** button (Fig.LP-3.5).

   The file has been saved in the selected location and the name of the file appears on the title bar of the gedit window (Fig.LP-3.6).



Fig.LP-3.5



Fig.LP-3.6

After writing and saving the program, let's learn to compile and execute it.

Compiling and Executing a C Program in Linux

During the compilation of a C program, the compiler translates the source code of the program into machine language. Before compiling and executing a program, you must ensure that you have already written the C program and saved it with the .c extension. Now, you can compile it and link it with system library functions. Finally, you can execute the program to display the output. In Linux, GNU C and C++ compiler (gcc) are available. Following is the command to compile a C program in Linux environment:

```
gcc Hello.c -o Hello
```

where, Hello is the file name.

Use the following command to execute a C program:

```
./Hello
```

where, Hello is the file name.

Perform the following steps to compile and execute the C program:

1. *Select* **Applications→System Tools→Terminal** to open the **Terminal** window, as shown in Fig.LP-3.7:

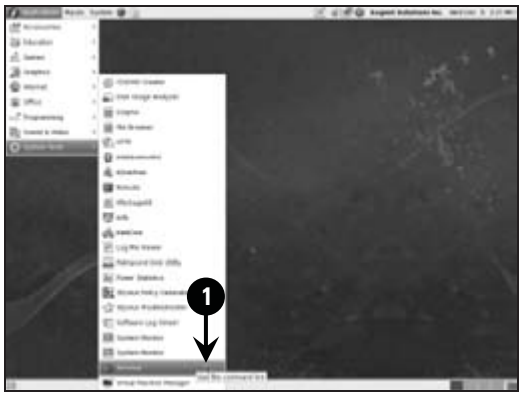


Fig.LP-3.7

2. *Type* the **gcc Hello.c -o Hello** command for compiling the program (Fig.LP-3.8).
3. *Press* the **ENTER** key. The cursor moves to the next line (Fig.LP-3.9).
4. *Type* the **./Hello** command to run the program (Fig.LP-3.9).

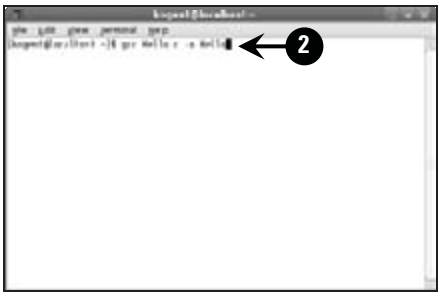


Fig.LP-3.8

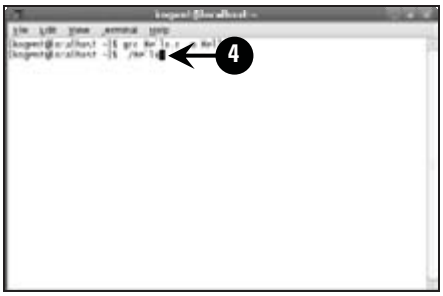


Fig.LP-3.9

5. *Press* the **ENTER** key. The output of the program is displayed on the Terminal window, as shown in Fig.LP-3.10:



Fig.LP-3.10

In this section, you have learned to compile and execute the C program. Now, let's explore the C operators used in C programming.

Exploring C Operators

An operator is a symbol in C, such as +, -, &&, or ==, which helps the user to perform several mathematical and logical computations. Basically an operator is used to work upon certain data and produce an output as a result of that operation. The operators included in C programming language are used to operate not only on numbers but also on data and variables.

The operators in C are classified into various types. The commonly used operators are:

- Arithmetic Operators
- Logical Operators
- Relational Operators
- Assignment Operators
- Conditional Operators
- Increment/Decrement Operators
- Bitwise Operators

Now, let's learn about each of them in detail starting with arithmetic operators.

Arithmetic Operators

Arithmetic operators perform the usual arithmetic operations in a C program. The different arithmetic operators in C are: +, -, *, \ and %. However, the % (modulo) operator is used to return the remainder

value after dividing two integers. The % operator cannot be used for float data type or double data type. If both operands `i1` and `i2` are integers then the expression `i1\i2` provides integer division. Even if the target is a floating point variable, it provides floating division. Listing 3.2 shows an example of arithmetic operators:

Listing 3.2: Using Arithmetic Operators

```
#include <stdio.h>
int main() {
int a,b;
int sum, sub, mul, rem;
a=10;
b=8;
sum = a+b;
sub =a-b;
mul = a*b;
rem = a/b;
printf("sum=%d\n", sum);
printf("sub=%d\n", sub);
printf("mul=%d\n", mul);
printf("rem=%d\n", rem);
return 0;
}
```

Following is the output of the preceding program:

```
sum=18
sub=2
mul=80
rem=1
```

Now, let's learn about logical operators.

Logical Operators

You can combine the results of multiple relations or logical operations by using logical operators. The logical operators are negation (!), logical AND (&&) and logical OR (||). The negation operator takes only one operand and returns a false value if the operand is true and vice-versa. The AND operator returns a value 1 if both expressions are true and the OR operator returns the value 1 if either of the expression is true. It can be explained in a better way by using Table 3.3:

Table 3.3: The Logical Operators

R1	R2	R1 && R2	R1 || R2	! R1
T	T	T	T	F
T	F	F	T	F
F	T	F	T	T
F	F	F	F	T

In short, you can say that the logical AND operator returns True, if both the relational expressions are True. The logical OR operator returns True, if any one of the expressions is True. The negation operator returns the complement of the value of relational expression. Listing 3.3 shows the use of logical operators:

Listing 3.3: Using Logical Operators

```
#include <stdio.h>
int main() {
 int a, b, c;
```

```
a=4;
b=8;
c=7;
if(a<b && b>c)
printf("a is less than b and b is greater than c\n");
if(a>b || b>a)
printf("a is greater than b or b greater than to a\n");
return 0;
}
```

Following is the output of the preceding program:

```
a is less than b and b is greater than c
a is greater than b or b greater than to a
```



In Listing 3.3, the if statement is used. It is a conditional control statement. A conditional control statement is a statement used in a programming language to check the specified condition.

Now, let's learn about relational operators.

Relational Operators

The relational operators in C are used to test the relation between two entities. The relational operators return true or false depending upon the condition that the two entities hold. The relational operator also returns either zero or non zero values. The zero value is taken as false while the non zero value is taken as true. The different relational operators in C are: `<`, `<=`, `>`, `>=`, `==`, and `!=`. Listing 3.4 shows the example of relational operators:

Listing 3.4: Using Relational Operators

```
#include <stdio.h>
int main() {
int a=10;
int b=20;
if (a==b)
printf("a and b are equal\n");
if (a<b)
printf("a is less than b\n");
if (a>b)
printf("a is greater than b\n");
return 0;
}
```

Following is the output of the preceding program:

```
a is less than b
```

Now, let's learn about assignment operators.

Assignment Operators

Assignment operators are used to evaluate the expression of the right hand side and assign it to the variable on the left hand side.

For example,

```
var=a+b;
```

First, the value of a and b is evaluated and then it is assigned to the variable, var.

You can use the assignment operators of C in a compact manner in an expression. These compact expressions are known as the shorthand assignment operators. The shorthand way of working with

operators is also associated with arithmetic operators. The equal (=) operator is known as the shorthand operator in C. Table 3.4 shows how to use shorthand assignment for various operators:

Table 3.4: Shorthand Assignment Operators

Operator	Assignment	Shorthand Assignment
+(addition operator)	a = a + b	a += b;
-(subtraction operator)	a = a - b	a -= b;
*(multiplication operator)	a = a *b	a *= b;
/<division operator>	a = a/b	a /= b;

Listing 3.5 shows an example of using the shorthand assignment operators:

Listing 3.5: Using Assignment Operators

```
#include <stdio.h>
int main() {
int m,n,p;
m=10;
n=12;
p=5;
m += n;
n -= p;
printf("m=%d n=%d\n", m, n);
return 0;
}
```

Following is the output of the preceding program:

```
m=22 n=7
```

Conditional Operators

Conditional operators, more commonly called the ternary operators (? :) in C are used to return values that are based on the outcome of relational expressions. The syntax for conditional operators in C is as follows:

```
e1 ? e2 : e3
```

In the preceding syntax, first, e1 is evaluated, if it is true, then e2 is evaluated, which then becomes the result of the expression. If e1 is false, then e3 is evaluated, which, then becomes the result of the expression. Listing 3.6 shows the how to use conditional operators:

Listing 3.6: Using Conditional Operators

```
#include <stdio.h>
int main() {
int m,n;
int exp1, exp2;
m=30;
n=50;
exp1 = m > n ? m : n;
printf("The value of exp1 is = %d\n", exp1);
exp2 = m < n ? m: n;
printf("The value of exp2 is = %d\n", exp2);
return 0;
}
```

Following is the output of the preceding program:

```
The value of exp1 is = 50
The value of exp2 is = 30
```

Now, let's learn about increment/decrement operators.

Increment/Decrement Operators

You can increment or decrement the value of a variable by using the increment (++) or decrement (--) operator. The increment operator is used to add 1 to its operand and the decrement operator is used to subtract 1 from its operand. In other words, the increment operator increases the value of an integer by 1 and the decrement operator decreases the value of an integer by 1. For example, if int m =4, then expressions m++ means m = m + 1. So, the value of m becomes 5. Listing 3.7 shows the use of increment/decrement operators:

Listing 3.7: Using Increment and Decrement Operators

```
#include <stdio.h>
int main() {
int m, n;
m = 5;
n = 6;
m++;
n--;
printf("m = %d \n", m);
printf("n = %d\n", n);
return 0;
}
```

Following is the output of the preceding program:

```
m = 6
n = 5
```

Now, let's learn about bitwise operators.

Bitwise Operators

The bitwise operators assume operands as string of bits and the bit operations are done on this operand. There are 6 bit operators in C: AND(&) operator, OR(|) operator, XOR(^) operator, complement(~) operator, left shift(<<) operator, and right shift(>>) operator. Different bitwise operators have been explained in detail in Table 3.5:

Table 3.5: Description of Bitwise Operators and their Explanation

Operator	Explanation
&	Compares each bit of the first operand with the corresponding bit of the second operand. If both bits are 1, then the corresponding bit is set to 1, else it is set to 0.
|	Compares each bit of the first operand with the corresponding bit of the second operand. If either of the bit is 1, the result is set to 1, otherwise the result bit is set to 0.
^	Compares each bit of the first operand with the corresponding bit of the second operand. If one bit is 0 and the other bit is 1, the result is set to 1, otherwise the result is set to 0.
~	Assigns every bit that is 1 in the operand as 0 in the result and vice-versa.
<<	Shifts their first operand to its left.
>>	Shifts their first operand to its right.

Listing 3.8 shows an example of using bitwise operators:

Listing 3.8: Using the Bitwise Operators

```
#include <stdio.h>
int main() {
int p, q;
```

```
p = 5;
q = 6;
p = p >> 1;
q = q << 1;
printf("p = %d \n", p);
printf("q = %d\n", q);
return 0;
}
```

Following is the output of the preceding program:

```
p = 2
q = 12
```

Now, let's discuss about the operator precedence.

Operators Precedence

Since C has various types of operators, it also sets precedence rules so that the value of expressions that involve multiple operators are deterministic. Table 3.6 summarizes the precedence of operators in C:

Table 3.6: Operator Precedence in C

Operators	Order of Evaluation
(),[],.,->,++,--	Left to right
++,--,+,-,!,~,*,&	Right to left
*, /, %	Left to right
+,-	Left to right
<<, >>	Left to right
<,<=, >,>=	Left to right
==,!=	Left to right
&	Left to right
^	Left to right
|	Left to right
&&	Left to right
||	Left to right
?:	Right to left
=,+=, -=,*=,/=,%=,&=,^=,|=,<<=,>>=	Right to left
,	Left to right

With this, we come to the end of this chapter. Before moving to the next chapter, let's summarize the main points of the chapter.

Summary

In this chapter, you have learned the features of C programming. You have also learned the basic concepts used in C programming, such as constants, variables, and data types. Next, you have create, and saved a C program and then learned to compile and execute it. In the end of the chapter, you have learned various operators used in C programming.

CHAPTER



Working with Control Structures

In this Chapter:

- Working with Decision Control Structure
- Working with Looping Control Structure
- Using Jump Statements

In a programming language, a program is not just a linear sequence of instructions rather it may contain a repeated code or decision-making code. The C language provides control structures, which are also known as control flow statements, for executing the repeated or decision-making code. Control structures are statements that decide the order in which individual statements or a group of statements of a program are executed or evaluated. Some examples of control statements are: if-else, switch, and do-while.

In the C language, control structures are divided in two categories, which are as follows:

- **Decision Control Structure:** Executes a single statement or a group of statements based on a specific condition. The control structures, such as if-else and switch, belong to this category.
- **Looping Control Structure:** Executes one or more statements repeatedly until a condition is met. The control structures, such as while, do…while, and for loops, belong to this category.

In this chapter, you learn about various control structures. The chapter starts with the decision control structure, such as if, if-else, and nested if-else. Next, you learn about looping control structure, such as while, do-while, and for loops. In the end, you learn about jump statements, such as break, continue, and goto.

Let's start by learning about decision control structure.

Working with Decision Control Structure

Decision control structure is a control structure that allows you to select one or more execution paths in a program. It enables a program to execute a block of code after evaluating a given conditional expression. If the conditional expression comes out to be true, the accompanying block of code is executed; otherwise, it will not be executed, and control passes to the next block of code. The decisional control structure provides the following statements:

- The if statement
- The if-else statement
- The if-else ladder
- The nested if-else statement
- The switch statement

Let's now explore these statements in detail.

The if Statement

The if statement executes a simple or compound statement, when the specified condition is true. A simple statement consists of a single statement while a compound statement contains a group of more than one statement. The syntax to use the if statement for a simple statement is as follows:

```
if(conditional expression)
//statement;
```

The syntax to use the if statement for a compound statement is as follows:

```
if(conditional expression)
{
statement 1;
statement 2;
statement 3;
}
```

In the preceding syntaxes, the simple or compound statement (block of statements) is executed when the conditional expression given in the if statement is true. Otherwise, the program control passes to the next statement. Listing 4.1 shows an example to use the if statement:

Listing 4.1: Using the if Statement

```
#include <stdio.h>
int main()
```

```
{
 int grade;
printf("Enter your grade\n");
scanf("%d", &grade);
if(grade > 7)
printf("You are excellent performer\n");
return 0;
}
```

The output of the preceding listing is as follows:

```
Enter your grade
9
You are excellent performer
```

In Listing 4.1, you have to enter your grade at run time. If the grade entered by you is more than 7 then only the statements under the if statement are executed; otherwise, the statement will not be executed. In our case, we enter 9 as our grade, which is greater than 7; therefore, the You are excellent performer message is displayed.

Let's now learn about the if-else statement.

The if-else Statement

The if-else statement executes a statement under the if statement when the conditional expression provided in the if statement is true. However, when the conditional expression specified in the if statement is false, then it executes the statements under the else statement.

The syntax of the if-else statement is as follows:

```
if (conditional expression)
statement 1;
else
statement 2;
```

In the preceding syntax, when the conditional expression specified in the if statement is true, statement 1 is executed; otherwise, statement 2 is executed.

Listing 4.2 shows an example to use the if-else statement:

Listing 4.2: Using the if-else Statement

```
#include <stdio.h>
int main()
{
 int a, b;
printf("Enter the value of a and b\n");
scanf("%d %d", &a, &b);
if(a > b || a<b)
printf("a and b are not equal\n");
else
printf("a and b are equal");
return 0;
}
```

The output of the preceding listing is as follows:

```
Enter the value of a and b
45
45
a and b are equal
```

In Listing 4.2, you have to enter the value of a and b at run time. If the value of a is greater or less than the value of b, then the if statement is executed; otherwise, the else statement is executed. In our case, we

have entered the values of both, a and b, as 45; therefore, the else statement is executed and the message, a and b are equal, is displayed.

Let's now learn about the if-else ladder.

The if-else Ladder

When more than one if-else statement is used in a sequence, it is called as if-else ladder. The syntax to use the if-else ladder is as follows:

```
if (conditional expression 1)
 statement1;
else if (conditional expression 2)
statement2  ;
else if (conditional expression 3)
statement3  ;
```

In the preceding syntax, if conditional expression 1 is true then the statement1 is executed. If conditional expression 1 is false and conditional expression 2 is true then the statement2 is executed. When conditional expression 1 and conditional expression 2 are false, and conditional expression 3 is true then statement 3 is executed. You should note that depending on the conditional expression, only one of the statements is executed. Listing 4.3 shows an example to use the if-else ladder:

Listing 4.3: Using the if-else ladder

```
#include <stdio.h>
int main()
{
 int a, b,c;
printf("Enter the value of a, b, and c\n");
scanf("%d %d %d", &a, &b, &c);
if(a > b && a>c)
printf("a is greater than b and c\n");
else if(b >a && b > c)
printf("b is greater than a and c\n");
else if("c > a && c > b")
printf("c is greater than a and b\n");
return 0;
}
```

The output of the preceding listing is as follows:

```
Enter the value of a, b, and c
56
89
32
b is greater than a and c
```

In Listing 4.3, you have to enter the value of a, b, and c at run time. If the value of a is greater than b and c, then if statement is executed. However, if the value of b is greater than a and c, then the first else if statement is executed; and if c is greater than a and b then, the second else if statement is executed. In our case, we have entered the values of a, b, and c as 56, 89, and 32. This implies that the first else if statement is true. Therefore, the message, b is greater than a and c, is displayed.

Let's now learn about the nested if-else statement.

The Nested if-else Statement

In the nested if-else statement, either the if part contains an if-else statement or the else part contains an if-else statement within its body.

The syntax of the nested if-else statement is as follows:

```
if (conditional expression1)
statement 1;
else
     if (conditional expression2)
     statement2;
     else
  statement 3;
```

In the preceding syntax, if-else is nested within the else statement. When the conditional expression1 is true, statement 1 is executed; otherwise, the conditional expression2 in the second if statement is checked. If it is true then statement2 is executed; otherwise, statement3 is executed. Listing 4.4 shows an example of using the nested if-else statement:

Listing 4.4: Using the Nested if-else Statement

```
#include <stdio.h>
int main()
{
 int age_p1, age_p2;
printf("Enter the age of both person\n");
scanf("%d %d", &age_p1, &age_p2);
if(age_p1 == age_p2)
printf("Both person are the same age\n");
else
 {
  if(age_p1 > age_p2)
    printf("p1 is older than p2\n");
   else
    printf("p2 is older than p1\n");
 }
return 0;
}
```

The output of the preceding listing is as follows:

```
Enter the age of both person
45
56
p2 is older than p1
```

In Listing 4.4, the if-else statement is nested within the first else statement. You have to enter the age of two persons at run time. If the age of both persons is equal, then the first if statement is true. If the age of first person (p1) is greater than the age of second person (p2), then the second if statement is true. Otherwise, the second else statement is true. In our case, we have entered 45 and 56 as the age of p1 and p2. Therefore, the message, p2 is older than p1, is displayed.

Let's now learn about the switch statement.

The switch Statement

The switch statement is a conditional statement that matches a specific value against different values. If the specified value is matched with any of the given values, then the corresponding group of statements is executed. The switch statement begins with the switch keyword that is followed by an expression in the parenthesis (). It is a combination of multiple case labels that must be separated by the break statement. Every case label contains a constant value that is matched against the value, which is specified in the switch expression. If the value is matched, then the statements of that case label are executed. In addition, you can specify the default label, which is executed when the value specified in the switch expression does not match with the values of given case labels. The syntax of switch statement is as follows:

```
switch(expression)
{
    case value1: statement1;
    break;
    case value2:  statement2;
    break;
    case value3: statement3;
    break;
    .
    .
    .
    default: default_statement;
}
```

In the preceding syntax, the value of the expression is compared against the constants provided in the case labels. If the value of the expression matches with any of the values of the case constants, the code associated with that case constant is executed. However, while matching the specified value with the values of case constants, the execution reaches a break statement, the switch statement ends. When the switch expression does not match with the value of any case constant, then the code in the default statement is executed. Listing 4.5 shows an example of using the switch statement:

Listing 4.5: Using the switch Statement

```
#include <stdio.h>
int main()
{

 int grade;
printf("Enter your grade (from 1 to 5)\n");
scanf("%d", &grade);
switch(grade)
{
 case 1:
     printf("Your grade is A: Excellent\n");
     break;
 case 2:
     printf("Your grade is B: Very Good\n");
     break;
 case 3:
     printf("Your grade is C: Good\n");
     break;
 case 4:

     printf("Your grade is D: Bad\n");
     break;
 case 5:
     printf("Your grade is E: Fail\n");
     break;
 default :
   printf("Your have entered wrong grade\n");
}
return 0;
}
```

The output of the preceding listing is as follows:

```
Enter your grade (from 1 to 5)
2
Your grade is B: Very Good
```

In Listing 4.5, the value supplied by you at run time is stored in the grade variable. This variable is used as a parameter by the switch expression and is compared against the constants in the case labels. In our case, we have entered 2, which is matching with the case label 2. Therefore, the Your grade is B: Very Good message is displayed.

In the preceding section, you have learned about various decisional control structures. Let's now learn about another type of control structure, known as loops.

Working with Looping Control Structure

The term, loop, means repetitive execution of the same set of instructions for a given number of time or until a specified result is obtained. The statements that are executed repetitively are called iterative statements. The loop repeatedly executes a block of code based on a conditional expression, as long as the condition evaluates to true. When the conditional expression evaluates to false, the loop exits and the control is transferred to the next statement that follows the loop. The C language supports the following loops:

- The while loop
- The do-while loop
- The for loop

Let's now discuss these in detail.

The while Loop

The while loop executes statements till the conditional expression specified in it is true. The loop gets terminated when the condition becomes false. The syntax to use the while loop is as follows:

```
while (conditional expression)
simple or compound statement;
```

In the preceding syntax, if the conditional expression evaluates to true, the statements within the body of the while loop are executed. These statements are executed repeatedly until the conditional expression is true. Whenever the conditional expression evaluates to false, the loop gets terminated. Note that the statement, which is executed on the basis of a conditional expression, can either be simple or compound. The simple statement is written immediately after the while statement, and without using the curly braces. However, the compound statement is specified within the curly braces. Listing 4.6 shows an example to use the while loop:

Listing 4.6: Using the while Loop

```
#include <stdio.h>
int main()
{
 int n=0;
while(n < 5)
{
printf("%d\n", n);
 n=n+1;
}
return 0;
}
```

The output of the preceding listing is as follows:

```
0
1
```

```
2
3
4
```

In Listing 6, an integer variable, n, is initialized with 0. The while loop checks whether or not the value of n is less than 5. If the value of the n variable is less than 5, the printf() function displays the value stored in it, and then the value of n is increased by 1. The while loop stops executing, when the value of the n variable becomes greater or equal to 5.

The do-while Loop

The do-while loop executes the loop body at least once, whether the condition is true or not. Firstly, it executes the statements specified in the loop body, and then evaluates the condition. The do-while loop executes a group of statements as long as the specified condition is true. If the condition becomes false, the flow of execution comes out of the do-while loop. The syntax to use the do-while loop is as follows:

```
do
simple or compound statement;
while(conditional expression);
```

In the preceding syntax, the do keyword is followed by a simple or compound statement, and then by the while statement having a conditional expression. The simple or compound statement represents the loop body of the do-while loop. The do-while loop is executed at least once, without depending upon the condition specified in the loop. If the condition specified in the loop turns to be true, the loop is executed again; otherwise, it is exited.

Note that when the do-while loop is constructed with a simple statement, the body of the loop is not represented by curly braces. Listing 4.7 shows the use of do-while loop with a compound statement:

Listing 4.7: Using the do-while Loop

```
#include <stdio.h>
int main()
{
  int num;
  num = 0;
  do
{
        printf( "%d\n", num );
        num = num + 1;
}
 while (num > 0 && num <= 5);
 return 0;
}
```

The output of the preceding listing is as follows:

```
0
1
2
3
4
5
```

In Listing 4.7, the program displays the value of the num variable and increments the value of the variable until the condition of the do-while loop evaluates to false.

The for Loop

The for loop iterates the loop body for a fixed number of time. It consists of three parts: initialization, conditional expression, and post expression. The initialization part initializes the variable with a value, and is executed only once. The initialization part is followed by the conditional_expression part that

contains the condition to be evaluated. The post_expression is used to increment or decrement a counter variable controlling a loop.

The syntax of the for loop is as follows:

```
for(initialization;conditional_expression;post_expression)
simple or compound statement;
```

If the conditional_expression evaluates to false, then the statements following the for loop are executed. However, if the conditional_expression evaluates to true, then the body of the for loop is executed. The for loop continues to execute until the conditional_expression evaluates to false. The simple or compound statement represents the loop body of the for loop.

Note that when the for loop contains a simple statement, the body of the loop is not represented by curly braces. Listing 4.8 shows an example of using the for loop with a simple statement:

Listing 4.8: Using the for Loop

```
#include <stdio.h>
int main()
{
  int num;
  int num1;
  printf("Enter the value of num1\n");
  scanf("%d", &num1);
  for(num=1; num<=num1; num++)
   printf("%d\n", num);
 return 0;
}
```

The output of the preceding listing is as follows:

```
Enter the value of num1
9
1
2
3
4
5
6
7
8
9
```

In Listing 4.8, the num variable is initialized with the value 1, and incremented by 1 to display numbers on each iteration. The evaluation becomes false when the value of the num variable exceeds the value of the num1 variable entered by user.

When the for loop contains another for loop, it is called a nested for loop. In the nested for loop, the execution starts from the outer for loop to the inner for loop. The inner for loop then continues execution till the condition specified in it evaluates to true. When the inner for loop is executed once, the flow of execution is passed to the outer for loop to continue the next iteration and then again the inner for loop is executed. This implies that for the each iteration of the outer loop, the inner loop is executed completely. Listing 4.9 shows an example of using the nested for loop:

Listing 4.9: Using the Nested for Loop

```
#include <stdio.h>
int main()
{
 int i,j;
 for(i=1;i<=6;i++)
```

```
 {
   for(j=1;j<=i;j++)
    printf("%d",j);
    printf("\n");
}
return 0;
}
```

The output of the preceding listing is as follows:

```
1
12
123
1234
12345
123456
```

In Listing 4.9, the execution begins with an outer for loop in which the i variable is initialized to 1. Then the execution enters into the inner for loop where the j variable is initialized to 1. The inner loop gets executed and the value of j gets printed till the value of j is less than or equal to i.

The inner loop terminates when the value of j exceeds the value of i. The outer loop terminates when the value of i exceeds 6.

Let's now learn about the jump statements.

Using Jump Statements

The jump statements are the statements that transfer control from one part of the program to another. The jump statements supported by C are follows:

- break
- continue
- goto

Let's discuss these statements in detail.

The break Statement

The break statement is used to break any type of loop as well as the switch statement. Breaking a loop means terminating the loop. Listing 4.10 shows an example of using the break statement:

Listing 4.10: Using the break Statement

```
#include <stdio.h>
int main()
{
 int num1;
int j=2;
 printf("Enter a number to check whether it is a Prime number or not \n");
  scanf("%d", &num1);
  while(j <= num1-1)
  {
    if(num1 % j == 0)
    {
       printf("Number entered by you is not a Prime number\n");
       break;
    }
      j++;
   }
    if(j == num1)
```

```
            printf ( "Number entered by you is a Prime number\n");
     return 0;
    }
```

The output of the preceding listing is as follows:

```
Enter a number to check whether it is a Prime number or not
37
Number entered by you is a Prime number
```

In Listing 4.10, the j variable is initialized with the value 2 and the while loop is used to check whether a number entered by user is a prime number or not. If the num1 % j condition is equal to zero, then the message, Number entered by you is a not a Prime number, appears and the break statement breaks the while loop. If the first if condition, num % j ==0, is false for all the values of j between j=2 to num1 -1, then num1 will be a prime number and the message, Number entered by you is a Prime number, is displayed.

The continue Statement

The continue statement breaks the current execution of a loop condition and then continue the loop with the next condition. However, the break statement breaks the entire loop when a specified condition of the loop is met. Listing 4.11 shows an example of using the continue statement:

Listing 4.11: Using the `continue` Statement

```
#include <stdio.h>
int main()
{
 int j;
  for(j=1;j<=9;j++)
 {
  if(j==8)
  continue;
 printf("%d\n", j);
}
 return 0;
}
```

The output of the preceding listing is as follows:

```
1
2
3
4
5
6
7
9
```

In Listing 4.11, we have used the `continue` statement inside an `if` statement. When the value of `j` becomes 8, the control of execution quits from the current loop and returns back to the `for` loop. The next iteration then displays the remaining numbers till the value of `j` becomes 9. Therefore, in the output, the first 1 to 9 numbers are shown, excluding 8 from the result.

The goto Statement

The goto statement is used to perform a transfer of control from one statement to another in a program. The user-defined labels are used to specify the goto statement in the program. The syntax to use the goto statement is as follows:

```
goto <label_name>;
…
```

```
…
…
<label_name>:statement;
```

In the preceding syntax, <label_name> specifies a user-defined label for the target statement to which the control should be transferred. This label should be followed by a colon and then the target statement.

Listing 4.12 shows an example to use the `goto` statement:

Listing 4.12: Using the goto Statement

```
#include <stdio.h>
int main()
{
  int a;
  for(a=1;a<=5;a++)
  {
  if(a == 4)
  goto lbl;
  else
  printf("%d\n", a);
  }
 lbl:
 printf("ABC\n");
return 0;
}
```

The output of the preceding listing is as follows:

```
1
2
3
ABC
```

In Listing 4.12, the for loop is executed when a has value 1, 2, and 3. As soon as the value of a becomes 4, the goto statement transfers control to the lbl label and the label terminates the for loop. When the goto statement transfers control to the lbl label, the message, ABC, appears.

With this, we come to end of this chapter. Before proceeding towards the next chapter, let's summarize the main points of this chapter.

Summary

In this chapter, you have learned about various control structures. The chapter has started with exploring the decisional control structure. Next, you have learned about looping statements: while loop, do-while loop, for loop, and nested for loop. Finally, you have learned about jump statements: break, continue, and goto.

CHAPTER

5

Working with Arrays and Functions

In this Chapter:

- Exploring Types of Array
- Working with Functions

Array and function are one of the main key features in C programming. However, their use is completely different from each other. An array is a set of related data items that has a common name. For example, we can define an array name **marks** to store the marks obtained by 100 students in an examination. Marks of a particular student are indicated by writing a number called index number or subscript in brackets after the array name. For example, marks[5] represents the marks obtained by the 6th student. While the complete set of marks is referred to as an array. The array can be of any variable type, such as int, float, double, and char.

Unlike an array, a function is used to reduce the length of code while writing a program. It is a block of code to perform a specific task. While writing programs by using the C language, you may need to use the same task at various places in the program. Function avoids writing the code for the same task repeatedly. A function has a unique name, and it is reusable.

In this chapter, you learn about the types of array and also learn how to declare, initialize, and process these arrays. Further, you explore the concept of functions and their types. You also explore how to declare, define, and call a function in a program. You also study about arguments and parameters and scope of variables. Finally, you learn about passing parameters to methods and using recursive function.

Exploring Types of Array

An array is a set of ordered data items of similar data type. It can be broadly classified into two types: one-dimensional array and multi-dimensional array. A one-dimensional array has only one subscript, and a multi-dimensional array has n subscripts, where n represents the dimensions of the array. Multi-dimensional arrays can be further classified into the two-dimensional and three-dimensional arrays.



Three-dimensional array contains 3 subscripts. For example, table[s1][s2][s3], where s1, s2, and s3 are considered as size for each subscript.

Now, let's learn about the following types of arrays:

- One-dimensional arrays
- Two-dimensional arrays

One-Dimensional Arrays

A one-dimensional array or a single dimensional array is used to store a linear list of values of the same type. The elements in a one-dimensional array are stored with the index values starting from zero to one less than the size of the array. Each element in a one-dimensional array is accessed by using the same name and a single subscript. A one-dimensional array is similar to a row matrix or a column matrix. Now, let's learn how to declare, initialize, and process the one-dimensional array in the following sections.

Declaring the One-Dimensional Array

Similar to an ordinary variable, you need to declare an array before using it. A one-dimensional array can be declared by using the following syntax:

```
data_type array_name[size];
```

In the preceding syntax, data_type represents the data type of the array to be declared, array_name represents the name of the array, and size represents the number of values of the data_type type that can be stored in the array_name array.

The following code snippet declares an integer array, myArray, of size 10:

```
int myArray[10];
```

In the preceding example, the myArray array can contain 10 elements, which are indexed 0 to 9.

Initializing a One-Dimensional Array

Once you have declared a one-dimensional array, you can initialize the array to specify an initial value to assign to the individual elements of the array one by one in the same way as you declare ordinary

variables. You can also initialize all the elements of an array at the time of declaring the array. An array element can take only a constant value, which can be an int, char, or string type.

The syntax for initializing an individual element of a one-dimensional array is as follows:

```
array_name[index] = value;
```

In the preceding syntax, array_name represents the name of the array, index represents the position of the array element in the array, and value represents the value being assigned to the array element.

The syntax to initialize all the elements of a one-dimensional array at the same time is as follows:

```
data_type array_name[size] = {value1, value2, value3,... valuen};
```

In the preceding syntax, data_type represents the data type of the array, array_name represents the name of the array, size represents the number of elements that can be stored in the array, and value1, value2, value3,… valuen are values assigned to the first, second, third,… n^{th} element of the array, respectively.

The element values in the right hand side of the preceding syntax must be enclosed in curly braces and must be separated by a comma. These values are assigned to the array elements in the same order defined in the array initialization. For example, value1 is assigned to the first array element, value2 is assigned to the second array element, and value3 is assigned to the third array element.

The following code snippet declares and initializes an integer array, myArray, of size 5:

```
int myArray[5] = {10, 20, 30, 40, 50};
```

Initialization of the array elements in the preceding code snippet is equivalent to initializing each array element separately, as shown in the following code snippet:

```
myArray[0] = 10;
myArray[1] = 20;
myArray[2] = 30;
myArray[3] = 40;
myArray[4] = 50;
```

Listing 5.1 shows how to initialize and display a one-dimensional array:

Listing 5.1: Initializing and Displaying a One-dimensional Array

```
#include <stdio.h>
int main() {
 int myArray[5] = {10, 20, 30, 40, 50};
 int j;
 printf("Elements of array are\n");
 for(j=0;j<5;j++)
printf("%d\n", myArray[j]);
return 0;
}
```

The following is the output of the preceding program:

```
Elements of array are
10
20
30
40
50
```

In the Listing 5.1, an integer array named as myArray[5] is declared and, it has initialized five elements of the array. Then, the program displays the elements of the array.

Processing of a One-Dimensional Array

You can perform certain operations on an array based on element-by-element. The processing of a one-dimensional array helps to perform the operation of addition and subtraction between two arrays on the element-by-element basis. It also helps to perform the operations, such as finding largest and smallest element of an array and finding a desired element of an array.

Listing 5.2 shows a program that find the sum of corresponding elements of two arrays:

Listing 5.2: Adding Elements of two One-Dimensional Arrays

```
#include <stdio.h>
int main() {
 int array1[15];
 int array2[15];
 int sum[15];
 int m;
 int j;
printf("Enter the size of array1 and array2");
scanf("%d", &m);
printf("Enter the elements of array1\n");
for(j=0;j<m;j++)
scanf("%d", &array1[j]);
printf("Enter the elements of array2\n");
for(j=0;j<m;j++)
scanf("%d", &array2[j]);
printf("sum of elements of array1 and array2\n");
for(j=0;j<m;j++) {
sum[j] = array1[j]+array2[j];
printf("%d\n", sum[j]);
}
return 0;
}
```

The following is the output of the preceding program:

```
Enter the size of array1 and array2
5
Enter the elements of array1
5
6
7
8
9
Enter the elements of array2
8
9
10
11
12
sum of elements of array1 and array2
13
15
17
19
21
```

In Listing 5.2, firstly you enter the size of both arrays: array1 and array2. Then, you enter the elements for array1 and array2. Finally, the addition between the elements of array1 and array2 are displayed.

Two-Dimensional Arrays

Two-dimensional array contains two subscripts placed after the array name. It is used to store a table that contains values of the same data type. It is similar to a matrix containing rows and columns. In this section, you learn to how to declare, initialize, and process the two-dimensional array.

Declaring the Two-Dimensional Array

In C, you can declare a two-dimensional array by using the following syntax:

```
data_type array_name[size1][size2];
```

In the preceding syntax, data_type represents the data type of the array to be declared, array_name represents the name of the array, size1 represents the number of rows, and size2 represents the number of columns.

The following line of code declares a two-dimensional integer array, myArray:

```
int myArray[4][5];
```

In the preceding line of code, the myArray array is a two-dimensional array containing 4 rows and 5 columns.

Initializing Two-Dimensional Array

Similar to a one-dimensional array, the elements of a two-dimensional array can be initialized either one at a time or all at once. The syntax for initializing the elements of a two-dimensional array is as follows:

```
data_type array_name[size1][size2] = {value1, value2, value3,...valuen};
```

In the preceding syntax, data_type represents the data type of the array, array_name represents the name of the array, size1 represents the number of rows in the array, and size2 represents number of columns in the array. value1, value2, value3,… valuen are values assigned to the element of the array row wise. The element values in the right hand side of the preceding syntax must be enclosed in curly braces and must be separated by a comma.

The following line of code declares and initializes a two-dimensional integer array, myArray:

```
int myArray[2][3] = {10, 20, 30, 40, 50, 60};
```

Initialization of the array elements in the preceding line of code is equivalent to initializing each array element separately as follows:

```
myArray[0][0] = 10;
myArray[0][1] = 20;
myArray[0][2] = 30;
myArray[1][0] = 40;
myArray[1][1] = 50;
myArray[1][2] = 60;
```

Listing 5.3 shows a program that declares, initialize, and access of a two-dimensional array.

Listing 5.3: Declaring, Initializing, and Accessing Elements of a two-dimensional Array:

```
#include <stdio.h>
int main()
{
    int a[3][3]={
    {1,2,3},
    {2,3,4},
    {3,4,1}
    };
    int i,j,m=3,n=3;
    printf("Elements of the array are:\n");
    for(i=0;i<m;i++)
        {
            for(j=0;j<n;j++)
            printf("%d ", a[i][j]);
            printf("\n");
    }
    return 0;
}
```

The following is the output of the preceding program code:

```
Elements of the array are:
1 2 3
```

```
2 3 4
3 4 1
```

In Listing 5.3, a two-dimensional array (3×3) is declared and initialized at the same time. Finally, the program accesses the elements of the two-dimensional array and displays these elements.

Processing of a Two-Dimensional Array

Processing of a two dimensional array includes certain kind of operations that can be performed on matrices. The following are the common list of operations that you can use on matrices by using the two-dimensional array:

- Reading and displaying elements of a matrix
- Adding and subtracting the corresponding elements of two matrices
- Multiplying two matrices



A matrix is a rectangular array of elements.

Listing 5.4 shows a program that is used to read and display a matrix.

Listing 5.4: Reading and Displaying a Matrix

```
#include<stdio.h>
int main() {
    int matrix[10][10], i, j, a, b;
    printf("Enter the number of rows in the matrix:\n");
    scanf("%d", &a);
    printf("Enter the number of columns in the matrix:\n");
    scanf("%d", &b);
    printf("Enter the elements of the matrix:\n");
    for(i=0; i<a; i++) {
     for(j=0; j<b; j++)
     scanf("%d", &matrix[i][j]);
    }
    printf("Elements of the matrix are:\n");
    for(i=0; i<a; i++) {
       for(j=0; j<b; j++)
       printf("%d ",matrix[i][j]);
       printf("\n");
    }
    return 0;
}
```

The following is the output of the preceding listing:

```
Enter the number of rows in the matrix:
3
Enter the number of columns in the matrix:
3
Enter the elements of the matrix:
10
12
14
20
22
24
30
32
34
Elements of the matrix are:
10 12 14
20 22 24
30 32 34
```

In the Listing 5.4, firstly you enter the number of rows and columns in array to define the size of the matrix. Then, you enter elements of the matrix one by one by using nested for loop (two for loops) and the scanf() function. Finally, the elements of the array are displayed in the matrix form.

After learning about arrays, let's now learn about functions in C programming.

Working with Functions

A function is a set of instructions to perform a specific task. Functions are used to avoid the repetition of codes in a program. For example, if you are writing a program that calculates the sum of the marks obtained by the student of a class. In this case, you need to write the statements that perform addition of the numbers repeatedly in the program. Consequently, the program becomes lengthy. In case, any error occurs in the program, it consumes a lot of time to detect and correct the error. Therefore, you can use functions to avoid the repetition of code in a program. While using a function in the program, you need to declare and define with a unique name. By using a function, the overall length of the source code can be reduced.

Let's now learn the types of function used in C.

Exploring the Types of Function

While writing programs by using the C language, various statements, such as printf() and scanf(), are used in most of the programs. These statements are functions, which are already defined in the C library. Moreover, the main() function is the function from where the execution of a program starts; therefore, this function is used in all the C programs.

The various functions that the C compiler provides to the programmers are called built-in functions. In addition to the functions provided by the C compiler, you can also create functions in your C program to perform various tasks, which are called user-defined functions.

Let's discuss the built-in and user-defined functions in the following sections.

Built-in Function

Built-in functions or built-in library functions are the functions provided in the library of the C compiler. These functions are commonly required to write a C program. Therefore, these functions are created and stored in the library of the C compiler by C developers.

User-Defined Function

Although, C compiler provides various functions to be used in a C program, but they are not sufficient for performing customized functions in a C program. Therefore, users or programmers may create their own functions in C programs, to perform their customizing tasks. The functions that the programmer or the user creates in a program are called the user-defined functions.

Let's now learn to declare a function.

Declaring a Function

When you declare a function, it provides information, such as the return type of function, number of parameters used in the function, and types of parameters. You are required to put semicolon at the end of function declaration. The following is the syntax to declare a function:

```
    return_type function_name(parameter types);
```

In the preceding syntax, return_type represents the return type of function, function_name represents the name of function, and parameter types refers to the list of parameters used in function.

You need to declare a function before using it in a program as you declare variables. However, if you define a function before the function was called for the first time in the program, then function declaration is not necessary.

Let's now learn how to define a function.

Defining a Function

When you define a function, we write the actual code that performs the intended task. Therefore, you must provide the function definition, before it is invoked or called in a program. Otherwise, compilation error occurs. You can define a function by using the following syntax:

```
return_type function_name (formal parameter list) {
  local variable declarations;
  executable statement 1;
  executable statement 2;
           ----------
  executable statement n;
  return (expression);
}
```

In the preceding syntax, return_type is the data type that the function returns. A function can return int, float, char, or any other data type that is available in C programming language. function_name refers to the name of the function and formal_parameter_list is the list of parameters passed into the function. The formal_parameter_list is a comma separated list of variables that receives the values from the main program when a function is called. The identifiers used as formal parameters are local to the function definition as they are not recognized outside the function. A function definition can also contain local variables that are declared inside the function. In addition, the function definition contains the executable statement that performs the intended task of the function. The last statement of a function definition is the return statement that returns the result of the function.



A function may not return a value. In such a case, the return type used with a function is void. In a function definition, the keyword void is used as a return type. It indicates that this function does not return a value. Therefore the return statement is not used in the function definition.

The following code snippet define a function that adds two numbers and returns their sum:

```
int sum(int marks1, int marks2) {
 int total;
total = marks1 + marks2;
return (total);
}
```

In the preceding code snippet, the sum() function is defined with the return type as integer value. The function contains two parameter lists; marks1 and marks2, and both are of int data types. The function definition contains the addition of two numbers (marks1 and marks2) and stores the addition into the variable name, total. It, then, returns the value of the variable, total.

Let's now learn to call a function.

Calling a Function

Calling or invoking a function means executing the code of a function from a program. A function can be called by specifying its name followed by a list of arguments enclosed in parentheses and separated by commas. If a function call does not require any arguments, then an empty pair of parenthesis follows the function name.

You can call a function by using the following syntax:

```
some_variable=function_name(actual_argument_list);
```

In the preceding code snippet, some_variable is the variable that stores the value returned from the function. It must be similar to the data type that the function returns. function_name is the name of the function invoked, and actual_argument_list is the list of actual argument passed into the method. A function can be called by specifying its name followed by a list of arguments enclosed in parentheses and separated by commas. If a function call does not require any arguments, then an empty pair of parenthesis follows the function name. Listing 5 shows an example of how to define and call a function in a program:

Listing 5.5: Defining and Calling a Function

```
#include <stdio.h>
int sum(int marks1, int marks2) {
 int total;
total = marks1 + marks2;
return(total);
}
int main() {
int sub1, sub2;
 printf("Enter the marks of sub1 and sub2\n");
 scanf("%d %d", &sub1, &sub2);
 int result = sum(sub1, sub2);
 printf("Total marks = %d\n", result);
 return 0;
}
```

The following is the output of the preceding listing:

```
Enter the marks of sub1 and sub2
87
69
Total marks = 156
```

In Listing 5.5, the sum() function is defined, which returns an integer value. The sum() function accepts two integer values as the parameters.

result is an integer variable, which receives the result that the sum() function returns.

Let's now learn about argument and parameters.

Understanding Argument and Parameters

Arguments and parameters are the variables used in functions. Arguments are the variables that are used in a calling function. They are also called as the actual arguments. Parameters are the variables that are used in function definition. These variables are called as formal parameters. For example, in Listing 5, sub1 and sub2 are arguments while marks1 and marks2 are parameters.

While using arguments and parameters, keep in mind that number of arguments should be same as the number of parameters.

Let's now learn about scope of a variable.

Exploring Scope of Variables

Scope of a variable refers to the visibility of the variable within a program. Different types of variables are used in a function definition as well as outside the function definition. These variables declaring at one place can or can't be accessible to the other place in the program. Based on scope of variable, it can be categorized into the following categories:

- Local variable
- Global variable

Let's discuss the behavior of these two variables.

Local Variable

The variables declared within a function or a block of codes is known as local variables. These variables are accessible only within the function or block of code in which it is declared. If you access the variable outside the function, a compilation error occurs. In Listing 5, marks1, and marks2 are the example of local variables. Using the local variables, it is easy to keep track of variables' name, because each function call results in creating new variables. For example, in Listing 5, the **total** variable declared in the sum() function is an example of local variable.

Global Variable

The variable declared outside the function is called global variable, and it is visible in all the block of codes or functions in the program.

Listing 5.6 shows an example of declaring a global variable that is accessible to all part of the program.

Listing 5.6: Using the Global Variable

```
#include<stdio.h>
int y;
int funct() {
  printf("Inside the function definition %d\n", y);
  return 0;
}
int main( ) {
  printf("Enter a number\n");
  scanf("%d",&y);
  printf("The number you entered is %d\n",y);
  int b = funct();
  return 0;
}
```

The following is the output of the preceding listing:

```
Enter a number
45
The number you entered is 45
Inside the function definition 45
```

In Listing 5.6, the y variable is declared as a global variable, and it is accessible from all the functions in the program.

Let's now learn about passing parameters methods.

Passing Parameter Methods

When a function is called or invoked, a list of parameters is passed into the function, if required. The list of parameters is passed into only those functions that have been defined with parameters. During its invocation and definition, either a variable or an address of a variable is passed into the functions, this function invocation is called call by value. However, when an address of the variable is passed to the function during its invocation, then this function invocation is called call by reference. Let's discuss the two types of function calls in the following sections.

Call by Value

Invoking a function by passing values or variables to the function is called call by value. When a method is invoked by passing values, the change made to the value is not visible outside the functions definition. Listing 5.7 shows an example of invoking a function by using the call by value method:

Listing 5.7: Using Call by Value

```
#include<stdio.h>
int swap(int a, int b) {
  int t;
  t = a;
  a = b;
  b = t;
  return 0;
  }
int main() {
  int a, b;
  a = 10;
  b = 20;
  printf("Value of a before function invocation: %d\n", a);
  printf("Value of b before function invocation: %d\n", b);
```

```
    swap(a, b);
    printf("Value of a after function invocation: %d\n", a);
    printf("Value of b after function invocation: %d\n", b);
return 0;
}
```

The following is the output of the preceding listing:

```
Value of a before function invocation: 10
Value of b before function invocation: 20
Value of a after function invocation: 10
Value of b after function invocation: 20
```

In Listing 5.7, the value of a and b is swapped that means the formal parameter has been changed inside the function definition. However, this change is not visible inside the main() function, where the swap() function is invoked.

If you want to access the changes made in the function definition outside the function definition, you can use the call by reference method, discussed in the next section.

Call by Reference

Invoking a function by passing the address of the variable to a function is called call by reference. When you pass the address of variable, the changes made to the value are visible outside the function Listing 5.8 shows an example of passing parameter by reference:

Listing 5.8: Using Call by Reference

```
#include<stdio.h>
int swap(int *m, int *n) {
  int temp;
     temp=*m;
     *m=*n;
     *n=temp;
return 0;
}
int main() {
     int n1, n2;
     printf("Enter the value of n1 : \n");
     scanf("%d", &n1);
     printf("Enter the value of n2 : \n");
     scanf("%d", &n2);
     printf("Value of n1 before function invocation: %d\n", n1);
     printf("Value of n2 before function invocation: %d\n", n2);
     swap (&n1,&n2);
     printf("Value of n1 after function invocation: %d\n", n1);
     printf("Value of n2 after function invocation: %d\n", n2);
     return 0;
}
```



In Listing 5.8, the swap function contains int *m, int *n as parameters in the function definition part. These are the integer type pointer variable. A pointer is a variable, which store a reference of another variable. Whenever we are talking about pointers, you need to learn about two operators: the reference operator (&) and indirection operator (*). The reference operator returns the address of a variable while the operator * refers to the value at address. In the function call, the &n1 and &n2 arguments has passed to the swap() function. In this function call, the address of variable n1, and n2 has passed.

The following is the output of the preceding Listing 5.8:

```
Enter the value of n1 :
10
Enter the value of n2 :
20
Value of n1 before function invocation: 10
```

```
Value of n2 before function invocation: 20
Value of n1 after function invocation: 20
Value of n2 after function invocation: 10
```

In Listing 5.8, the swap() function is created. In this function, arguments are passed by using the call by reference method. Inside the function definition, we swap the value of two variables. You notice that the changes made to the formal parameters inside the function definition is also reflected in the main() function.

Let's now discuss the recursive function.

Using the Recursive Function

The recursive function is a function that calls itself. Recursive functions are used to evaluate certain types of mathematical function. For example, if you are calculating the factorial of a number, then you multiply that number with the number -1. You continue doing this until you reach up to one, to get the factorial of the given number. In other words, if you are supposed to get the factorial of five, you need to perform the following multiplication:

```
5*4*3*2*1
```

In this example, the multiplication is performed repeatedly, until the number reaches one. The factorial calculated in this example can be calculated by using a recursive function, as shown in Listing 5.9:

Listing 5.9: Using the Recursive Function

```
#include<stdio.h>
int fact(int n) {
    if(n==1)
    return n;
    else
    return (n*fact(n - 1));
}
int main() {
    int n, fact1;
    printf("Enter a number:\n");
    scanf ("%d", &n);
              fact1=fact(n);
    printf("Factorial value of the number = %d \n", fact1);
   return 0;
}
```

The following is the output of the preceding Listing 5.9:

```
Enter a number:
6
Factorial value of the number = 720
```

In Listing 5.9, the fact() function is created to calculate the factorial of a number by using recursive function. This program asks users to enter the number whose factorial you want to calculate. In our case, we enter number 6, and the factorial of number 6 is displayed on the screen.

Summary

In this chapter, you have studied about the types of array and learned how to declare, initialize, and process these arrays. Further, you have discussed the concept of functions and their types. You have learned how to declare, define, and call a function in a program. You have also studied about arguments and parameters and scope of variables. Finally, you have learned about passing parameters methods and using recursive function.

ADVANCE TOPICS

CHAPTER

1

Introducing Linux Kernel and Memory Process

In this Chapter:

- Exploring the Functions of Linux Kernel
- Describing the Architecture of the Linux Kernel
- Describing the Kernel Data Structure
- Introducing Kernel Modules
- Setting Up the Run Levels
- Managing Memory
- Managing Processes

The Linux kernel is the core of the Linux operating system, which is used by a series of Unix-like operating systems. A kernel is a core component in the operating system, which acts like bridge between applications and data processing done by various hardware devices. Therefore, in other words, we can say kernel manages communication path and system resources between hardware and software. The Linux kernel was adopted and created in 1991 by Linus Torvalds, a software engineer. The term, Linux distribution, is used to refer to the operating systems that are based on the Linux kernel. It is the first part of the operating system, which is loaded into the memory during booting (system startup), and it remains there until the session is expired, because its services are required to work with the Linux operating system. The Linux kernel performs various tasks, such as controlling hardware devices, such as Central Processing Unit (CPU) and memory, managing memory and processes, enforcing security to the root account, and allocating resources, to output devices, including printer and scanner. The kernel does not interact directly with the user, rather it interacts with the shell, such as bash, ksh, and ssh. The Linux kernel provides the basic services and device drivers used by all other programs running on the Linux operating system. The Linux kernel is a resource manager that manages the resources, such as memory or hardware device and allows access to these resources among multiple users.

In this chapter, you learn about the functions of kernel . You also learn about the architecture and data structure of the Linux kernel. Next, you learn about the kernel modules and its utility. In addition, you learn about the different run levels in Linux. In the end, you learn how to manage memory and processes in Linux.

Let's begin with the functions of Linux kernel.

Exploring the Functions of Linux Kernel

The Linux kernel is the main part of the Linux operating system. It provides several new features, such as system initialization, memory management, process scheduling, security, storage, and networking protocols, which help the Linux operating system to work more efficiently as compared to the Windows operating system. Recently, the kernel is modified to support the kernel-based Virtual Machine (KVM). This modification provides a new interface to user space that allows other operating systems to operate on the KVM- enabled kernel.

The Linux kernel performs the following functions:

- **System Initialization**: Detects hardware resources, such as CPU and memory, and boots up the system. It also supports the addition and removal of software components on the system.
- **Process Scheduling**: Determines when and for how long the processes should run. The Linux kernel provides the process scheduling for the fast processing of the commands and provides good throughput to the system.
- **Memory Management**: Allocates memory to the running processes. It is the important resource that is managed by the Linux kernel. The Linux kernel memory management uses 4 KB buffer as its base, and keeps track of the pages, which are full, partially used, or empty. You can find the memory management resources in ./Linux/mm.
- **Security**: Verifies file system permissions constantly.
- **Storage**: Stores buffers and cache memory to speed up hardware access as per the systems' requirements
- **Protocols**: Implements standard network and file system protocols to establish communication between computers and enable file sharing. The Linux operating system is an open source operating system that provides several new networking protocols, such as Stream Control Transmission Protocol (SCTP), including the Transmission Control Protocol/Internet Protocol (TCP/IP). The Linux kernel also provides the extension for high-speed networking (greater than 1 Gigabit Ethernet [GbE] and 10 GbE).

In the preceding section, you have learned about the functions of the Linux kernel. Let's now learn the architecture of the Linux kernel that defines the basic components of the kernel.

Describing the Architecture of the Linux Kernel

The kernel architecture defines the components of a kernel, which are used by it to perform different tasks in the Linux operating system. The kernel architecture describes its components, such as system call interface, process management, virtual file system, memory management, network stack, arch, and device drivers. Fig.AT-1.1 shows the kernel architecture:

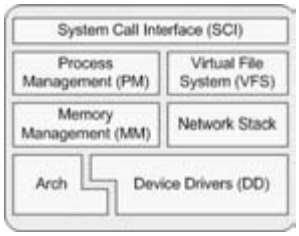


Fig.AT-1.1

The architecture of the Linux kernel provides the following components:

- **System call Interface (SCI)**: Defines all the services of the operating system used in the kernel. This interface can be architecture dependent, even within the same processor family. You can find the SCI implementation in ./linux/kernel, as well as architecture-dependent portions in ./linux/arch.
- **Process Management**: Focuses on the execution of processes. The processes in the kernel are called *threads* and represent an individual virtualization of the processor (thread code, data, stack, and CPU registers). In user space, the term, *process,* is used; though the Linux implementation considers processes and threads as the same concept. The kernel provides an Application Programming Interface (API) through SCI to create a new process (fork, exec, or Portable Operating System Interface [POSIX] functions), stop a new process (kill, exit), and develop communication and synchronization between them.
- **Virtual File System**: Provides a common interface abstraction for file systems. The virtual file system (VFS) is an interesting aspect of the Linux kernel as it provides a switching layer between SCI and the file systems supported by the kernel.
- **Memory Management**: Uses 4 KB buffer as its base. The hardware resources, such as CPU, use virtual memory to improve the performance. The memory is managed in *pages* (4 KB in size for most architecture). Linux manages the available memory as well as the memory separately allocated to hardware devices, such as printer for physical and virtual mappings.
- **Network Stack**: Follows a layered architecture modeled by design. It consists of seven layers, such as data link layer and physical layer. Each layer is assigned a different responsibility to transfer the data on to the network. Internet Protocol (IP) is the core network layer protocol that is located below the transport protocol layer (most commonly the Transmission Control Protocol, or TCP). The data in this layer is called packet and it transfers the data to the transport layer using IP. Above the TCP layer is the sockets layer, which is invoked through SCI.
- **Arc**: Presents the architecture dependent source code of the kernel The ./linux/arch subdirectory defines the architecture-dependent portion of the kernel source contained in a number of subdirectories that are specific to the architecture. You can find the architecture-dependent code in ./linux/arch.
- **Device Driver**: Contains a wide source code in the Linux kernel that makes a particular hardware device usable. The Linux source code tree provides a driver subdirectory that is further divided in various devices, such as Bluetooth, I2C and serial. You can find the device driver sources in ./linux/drivers.

After learning about the Linux kernel architecture, let's now learn about the Linux kernel data structure.

Describing the Kernel Data Structure

The kernel data structure provides the structure of the programs installed in the Linux kernel. It exists in the physical memory of the operating system and is accessible only to the kernel and its subsystems. The data structure lists the entry of the newly created programs in the Linux operating system. It also contains the data and files used in the system. The kernel data structure uses the following data structures to link its data with other data structures:

- Linked list
- Hash tables
- Abstract interfaces

Let's learn about these data structures in detail:

Linked Lists

A linked list links the data in the kernel data structure. In a linked list, a root pointer contains the address of the first data structure in the list, and then each subsequent data structure contains a pointer to the next element in the list. The last element's next pointer would be 0 or NULL to show that it is the end of the list.

Hash Tables

A hash table is an `array` or vector of pointers. It is simply a set of data that appears one after another in the memory. For example, a bookshelf is an array of books. Arrays are accessed by an index, which is set in the memory. A hash table contains the information about the data structure and speeds up the access to the commonly used data structures. The hash tables in Linux are generally used to implement caches.

Caches provide quick access to the information available in that particular area. Data structures are added into a cache and kept there because the kernel often accesses them. The drawback of caches is that they are more complex to use. If you find the data structure in the cache, you can add it to the hash table. If the data structure cannot find the data in the cache, all the relevant data structures need to be searched. As soon as the data structure is found, it is added to the cache. When the new entry is added to a new data structure then the old cache entry is discarded. Linux decides which data structure to discard as once the data structure is discarded it cannot be recovered.

Abstract Interfaces

The collection of routines and data structures, which operate in a well-defined manner, is known as an abstract interface in Linux. For example, all network device drivers must provide certain routines to operate on particular data structures, and these routines are known as abstract interfaces. This way there can be generic layers of code using the services (interfaces) of lower layers of a specific code. The network layer is generic and supported by device specific code that conforms to a standard interface.

In the preceding section, you have learned about the data structure of the kernel. Let's now learn about the kernel modules.

Introducing Kernel Modules

Kernel modules refer to the kernel codes, which are loaded in the kernel at the time of initialization. The operating system loads only those kernel modules that are essential for the system. The GNU root unified boot loader (GRUB) loads the dynamic modules into the initial ram disk (initrd) that are needed at the boot time. You may also load other modules that are required later to accomplish other tasks, such as kernel module to manage sound and video devices. You can find additional kernel modules in the **/lib/modules/** directory. Kernel modules are also called the third-party drivers and are typically used to add support to new hardware, file system, and add system calls. When kernel module is no longer required, it can be unloaded to free the memory.

After learning about the kernel modules, let's now learn about the kernel module utility and how to load and unload a kernel module.

Describing Kernel Modules Utility

The kernel modules utility refers to the group of commands that are used to map kernel modules in the Linux operating system. The kernel module is available if you have installed the modutils package. The kernel modules utility offers several commands, such as **insmode**, which are used to install the kernel modules.

The kernel modules utility provides the following commands:

- **depmod**: Handles dependency descriptions for loadable kernel modules
- **insmod**: Installs loadable module in the kernel
- **lsmod**: Lists loaded modules
- **modinfo**: Displays information about a kernel module
- **modprobe**: Provides high-level handling of loadable modules
- **rmmod**: Unloads the loadable modules

Let's now learn how to load and unload a kernel module.

Loading and Unloading a Kernel Module

A kernel module is automatically loaded when the kernel is initialized in the Linux operating system. Few modules, which are essential to operate the kernel, are included directly in the kernel. These modules perform various tasks, such as reducing the unnecessary memory requirement for the device drivers in the kernel and allowing you to load and unload a module as many times as you want without rebooting the system. In Linux, you can load and unload a module using the **modprobe** command. Type the following command at the terminal mode of the Linux operating system to load a kernel module:

```
[root@localhost ~]# insmod bluetooth
```

Type the following command to unload the currently installed module:

```
[root@localhost ~]# modprobe -r bluetooth
```

The lsmod command provides the list of all the loaded modules with their corresponding size and usage count. For example, to see the currently installed kernel module, type the following command:

```
[root@localhost ~]# lsmod
```

The preceding command shows the following output:

```
bluetooth              48608  5 bnepsco,l2cap
```



A module can be removed only if it is not currently in use.

After learning about the kernel modules and the process of loading and unloading it, let's now proceed ahead and learn to set up run levels (different modes to start the operating system).

Setting Up the Run Levels

In the Linux operating system, run level refers to a mode in which operating system is running. A system can be booted into any run level. Each run level is identified by a single digit integer and designates a different system configuration.

Table 1.1 shows the details of the run levels that Linux defines by default:

Table 1.1: Linux Kernel Run Levels

Run levels	Description
0	halt, no activity, the system can be safely powered down
1	Single user mode; rarely used
2	Multiuser mode without Network File System (NFS)
3	Full multiuser mode only for servers
4	Officially undefined

Table 1.1: Linux Kernel Run Levels	
Run levels	**Description**
5	Graphical login, only for desktops and laptops
6	Reboot
Emergency	Bypass **rc.sysinit**.sulogin

By default Linux boots either to run level 3 or run level 5. The run level 3 permits the system to run all services except GUI. The run level 5 allows all services including GUI. After learning about the setting the run level, let's now learn how to manage memory.

Managing Memory

Memory is one of the important hardware components in the computer. All applications need memory to run. On a broad basis, memory is managed at three levels – hardware, operating system, and application. Memory management at the hardware level is concerned with the electronic devices that actually store data. This includes things like RAM and memory caches. In the operating system, memory must be allocated to user programs, and reused by other programs when it is no longer required. In addition, the operating system can pretend that the computer has more memory than it actually does, and also that each program is utilizing a particular machine memory; both of these are features of virtual memory systems.

Application memory management involves supplying the memory needed for a program's objects and data structures from the limited resources available, and recycling that memory for reuse when it is no longer required. Since application programs cannot predict in advance how much memory they are going to require, they need additional code to handle their changing memory requirements. Following is the list of commands and techniques in the Linux-based operating system that helps you in managing memory efficiently:

- Top
- Vmstat
- Free
- Demand Paging
- Linux Page Caching

Let's learn about each command in detail.

Using the Top Command

The top command is similar to the Task Manager in Windows and displays a list of the running tasks and other details, such as, Memory Usage by each application and services of operating system running in the background. The output of top contains the following fields:

PID, User, PR, NI, VIRT, RES, SHR, S, %CPU, %MEM, TIME+, and COMMAND.

While some of the fields are not important, but you are required to monitor the memory using the %MEM column. This column displays the percentage of the total memory that the application is using, as shown in Fig.AT-1.2:

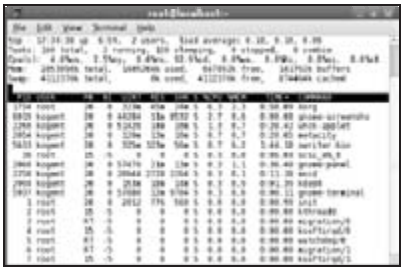


Fig.AT-1.2

You can stop the process by pressing the CTRL+Z key.

Using the Vmstat Command

The vmstat command shows the summary information about memory, processes, interrupts, paging, and blocks I/O information. The vmstat -S M command shows the memory size in megabyte (MB), which is easier to read and understand. You can type the vmstat command in the terminal window to access it and to view its output, as shown in Fig.AT-1.3:

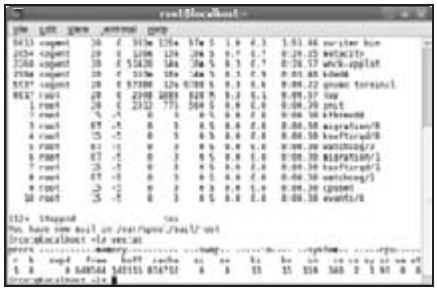


Fig.AT-1.3

Let's now learn about using the free command.

Using the Free Command

The free command shows the column that contains the memory-related information of your computer. The free -m -t command shows the information in MB units and a row at the bottom that gives the total amount of memory used, freed, shared, buffered, and cached.. You can manually type the free command in the terminal window to view the output of the free command. The output of the free command is shown in Fig.AT-1.4:

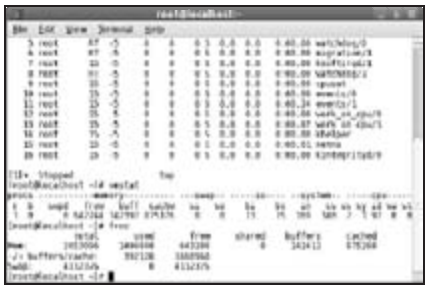


Fig.AT-1.4

Let's now learn about the demand paging in Linux.

Understanding the Demand Paging Technique

Demand paging is a technique through which virtual memory is implemented in the computer. Linux uses the demand paging technique to load executable images of computer process for the virtual memory.

Linux Page Caching

The Linux page cache is the cache of physical pages that are stored in the memory. The role of Linux page cache is to speed up access to files on the disk. The Linux page cache reads the memory mapped files and stores them in their page cache.. If the page is present in the cache, then it is easy to read and if

it is not present then it is fetched from the file system that holds the image (executable files) into the memory. Linux allocates a physical page to the memory and reads the page from the file on the disk.

After learning to manage memory, let's learn to manage processes in Linux.

Managing Processes

A process refers to a program that is being executed. In a simple case, a single process may be associated with a single user's job. Process management is concerned with the management of processes (tasks or jobs) allocated to a processor. Multiprocessing refers to the process in which two or more processes are executed simultaneously by a multiple processor computer system. In the time-sharing system, programs of several users reside in the computer's memory. Each user is allocated only a fraction of CPU time for their program. When a program is submitted to the CPU, it may be in one of the three states:

- **Running:** A process is running when its instruction sequence is being executed by a processor.
- **Ready:** A process is ready if all conditions are satisfied for the process to be in the running state and it is waiting for a processor.
- **Blocked:** A process is blocked when it is waiting for an event to occur before continuing execution.

Let's now learn the about the process scheduling in Linux.

Process Scheduling

Process scheduling means assigning priority to jobs and including new jobs for processing at appropriate times. When a user's job is submitted, the system takes note of its time of arrival, processing requirement, whether it is CPU-bound or I/O-bound. The scheduling technique is selected by considering all these factors. The process scheduler performs the following tasks:

- Allows you to create new copies of the process that are saved in the memory
- Helps you in determining total time between the submission of a process and its completion and total amount of time a process has been waiting in the queue.
- Receives interrupts and routing them to the appropriate kernel subsystem
- Sends signals to user processes
- Manages the timer hardware (used to set the time in the computer hardware)
- Cleans process resources when a process finishes executing

The process scheduler also provides support for dynamically loaded modules. These modules represent kernel functionality that can be loaded after the execution of the kernel starts. This loadable module functionality is used by the virtual file system and the network interface.

Virtual Memory

The virtual memory contains information about the image that it is currently executing (for example bash) and also has pointers to a number of vm_area_struct data structures. Each vm_area_struct data structure describes the start and end of the area of the virtual memory, the process' access rights to the memory and a set of operations for the memory. In the virtual memory, all addresses are virtual and not physical. These virtual addresses are converted into physical addresses by the processor. After that, the processor uses the information from the set of tables maintained by the operating system to perform the tasks, such as executing a computer program. Each process has a page table that translates the processes' virtual page frame numbers (VPFN) into physical addresses based on the VPFN's offsets.

With this, we come to an end of the chapter. Let's now summarize the main topics learned in this chapter.

Summary

In this chapter, you have learned about the Linux kernel and its functions. You have also explored the architecture of the Linux kernel and the data structure of the Linux kernel. Further, you have learned about the kernel modules and their utilities. In addition, you have learned about the different run levels in Linux. Finally, you have learned about managing memory and process in Linux.

CHAPTER

2

Introducing Network Administration in Linux

In this Chapter:

- Managing Network in Fedora 11
- Understanding the TCP/IP Network Model
- Ethernet LAN
- LAN Card Configuration
- Exploring the IP Address
- Classification of IP Addresses
- Working with the Dynamic Host Control Protocol (DHCP) Server
- Working with the Domain Naming Services (DNS) Server
- Working with the Samba File Server
- Working with the FTP Server
- Introducing Telnet Server
- Web Server
- Introducing the SQUID Proxy Configuration
- Assigning a Proxy on the Client Machine
- Introducing Mail Server in Fedora Linux

Network, in the field of computers, can be referred to as a collection of computers that communicate with each other either by a wired medium or a wireless medium. Networking in computers is mainly used for sharing files and common resources such as printers, scanners and modems. After a computer network is created, you need to maintain the hardware and the software responsible for efficient working of the network. This process is generally known as network administration. Network administration also include tasks such as adding new users and computers to a network and maintaining security across the network. The person responsible for network administration is called a network administrator. The network administrator performs various tasks, such as installing, configuring, expanding, protecting, upgrading, and repairing the network. Network administrators also handle network hardware devices, such as cables, switches and routers, and operates network software, such as the network operating system, e-mail servers, and backup software.

This chapter discusses various aspects of network administration in Linux. The chapter begins with acquainting you with managing networks in Fedora 11. Next, you learn about the (TCP/IP) network as well as the Ethernet LAN. You also learn to configure the LAN card. In addition, the chapter discusses IP addressing. Moreover, you learn about Dynamic Host Configuration Protocol (DHCP) and the Domain Naming Services (DNS) server. The chapter also discusses the Samba File server, File Transfer Protocol (FTP) server, and the Telnet server. It explains the Web server and the configuration of squid proxy. In the end, you learn about the mail server in the Fedora Linux.

Managing Network in Fedora 11

In Fedora 11 Linux, you can manage your network by using the NetworkManager service. You can configure your network connection either with the help of a wired connection, by using Local Area Network (LAN) with an Ethernet card, or with a wireless configuration, by using a DSL (Digital Subscriber Line) modem. The Linux kernel loads the driver for the Ethernet card when you install Linux on your system. You can view the loaded Ethernet driver in your system by typing the following command in the Terminal window:

```
dmesg | grep eth0
```

The previous command displays the output as shown in Fig.AT-2.1:



Fig.AT-2.1

You learn about the TCP/IP network model next.

Understanding the TCP/IP Network Model

A computer network adheres to protocols such as Transmission Control Protocol/Internet Protocol (TCP/IP) or File Transfer Protocol (FTP), which provides various standards and rules that a network must follow for communication. In addition to protocols, computer networks also require the support of additional utilities such as the Domain Naming Services (DNS) server and the Telnet server.

TCP/IP is a two-way communication protocol suite used to send and receive data from one computer to another over a network. This protocol uses the client/server model, where a client (user) requests the host computer (server) for network services, such as accessing and modifying files over the network; thereby establishing a communication. The TCP/IP protocol suite is not just a single networking protocol

but a collection of protocols, which are used to define the standards and rules for communicating over the Internet. This protocol uses the concept of IP addresses for communication. These IP addresses are unique numerical labels assigned to each device for its identification on a network. The TCP/IP protocol suite consists of five different layers, and each of these layers is responsible for performing a particular task.

The framework for the TCP/IP protocol suite is defined as a five-layered model, similar to the Open System Interconnection (OSI) model. The following are the layers of the TCP/IP protocol suite:

- The Physical layer
- The Data-Link layer
- The Network layer
- The Transport layer
- The Application layer

Fig.AT-2.2 shows the TCP/IP protocol suite with its different layers:

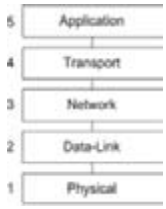


Fig.AT-2.2

Let's now discuss these layers in detail in the following sections.

The Physical Layer

The Physical layer provides the specifications of the interface and transmission medium used for communication in a network. The Physical layer transports the stream of data bits serially between two communicating devices in a network, along a transmission medium. The Physical layer helps synchronize the data bits, provides direction for data transmission between the two devices, and defines the data transfer rate. The Physical layer is the lowest layer of the TCP/IP protocol suite.

The Data-Link Layer

The Data-Link layer of the TCP/IP model handles data transfer between the network and the Physical layer. This layer is used to transfer packets of data or data frames between the Network layers of two different hosts (devices) using the same connection. The Data-link layer provides means to detect and correct the errors that occurred in the Physical layer. It also controls the process of transmitting and receiving packets from a given link and performs the functions, such as physical addressing (adding a header to a frame).

The Network Layer

The Network layer is the third layer of the TCP/IP model. This layer carries data from the source to the target location. The following protocols are used in the Network layer:

- **IP (Internet Protocol):** Refers to a protocol used to route data to various IP addresses in the form of datagram (a group of data packets, consisting of data or information). IP does not reorder data while sending the datagram back to the sender.
- **Address Resolution Protocol (ARP)**: Helps convert IP addresses into Media Access Control (MAC) addresses or physical addresses present on Network Interface Card of each device, which helps in the unique identification of the device.
- **Reverse Address Resolution Protocol (RARP)**: Helps to connect a computer to a network for the first time. RARP determines the IP address from a known MAC address or physical address.

- **Internet Control Message Protocol (ICMP)**: Helps to report problems with the delivery of IP datagrams within an IP network.
- **Internet Group Management Protocol (IGMP)**: Helps multicast data to multiple IP addresses at the same time.

Let's learn about the Transport layer in the next section.

The Transport Layer

The Transport layer is the layer in which the actual transmission of data takes place. In other words, it is the layer where the sending and receiving of data packets takes place between two hosts (devices). The following protocols are used in the Transport layer:

- **Transmission Control Protocol (TCP):** Refers to a connection-oriented protocol, which is used for reliability issues, such as dividing data sequentially, discarding duplicate data, and resending discarded/lost packets of data. As data packets flow in a single stream, the order of the data packets transmitted by TCP remains unchanged.
- **User Datagram Protocol (UDP):** Refers to a connectionless, unreliable protocol, which is used to streamline data. The delivery of data packets to the target host (device) is not ensured by this protocol.

In the next section, you learn about the Application layer

The Application Layer

The Application layer is the top-most layer in the hierarchy of the TCP/IP framework model. This layer is similar to the Session, Presentation, and Application layers of the OSI model. The following are some protocols used in the Application layer:

- **Hypertext Transfer Protocol (HTTP):** Refers to the protocol used for accessing resources over the Internet.
- **FTP:** Helps transmit different files between two hosts, clients, or servers.
- **Trivial FTP (TFTP):** Represents an advanced version of FTP, and is used to upload files.
- **Telnet:** Helps to establish a connection on a client computer by using the command-line interface. Telnet is short for Telecommunications Network.
- **Simple Mail Transfer Protocol (SMTP):** Refers to a protocol required for Internet services. This protocol is used to transmit mail consisting of an attachment.
- **Domain Name System (DNS):** Refers to a protocol that uses names rather than numbers to access hosts.

Table 2.1 summarizes the layers of the TCP/IP protocol suite and the equivalent OSI layers:

Table 2.1: The OSI and TCP/IP Model

OSI Ref. Layer No.	OSI Equivalent Layer	TCP/IP Layer	TCP/IP Protocol Examples
5,6,7	Application, Session, Presentation	Application	DNS, Telnet, FTP, Reverse Control Protocol (RCP), Routing Information Protocol (RIP), and Simple Network Management Protocol (SNMP)
4	Transport	Transport	TCP, UDP
3	Network	Internet	IPv4, IPv6, ARP, ICMP
2	Data-Link	Data-Link	Point-to-Point Protocol (PPP), Institute of Electrical and Electronics Engineers (IEEE) 802.2
1	Physical	Physical, Network	Ethernet (IEEE 802.3), Token Ring, and FDDI

The preceding table lists the layers from the application layer to the physical network.

After learning about different layers in the TCP/IP protocol model, let's now discuss Ethernet LAN in the next section.

Ethernet LAN

Ethernet refers to a network communication standard that uses a coaxial or twisted pair cable to transfer the data over the network. Ethernet is the most widely accepted and commonly used LAN technology developed by Dec, Intel, and Xerox corporations (DIX). It is a registered trademark name with Xerox, and standardized as IEEE 802.3. Ethernet uses the Carrier-Sense Multiple Access /Collision Detection (CSMA/CD) protocol to resolve conflicts that arise between two nodes (devices). Ethernet requires a repeater (an interconnecting device that is added to a network to extend the signal on the cable) to transfer data. A block of data transmitted to Ethernet is known as Ethernet Frame. Ethernet transmits data at a rate of million bits per second or Mbps.

Fig.AT-2.3 shows the Ethernet interface connection through a LAN cable:



Fig.AT-2.3

Ethernet is broadly divided into the following three categories based on the speed of data transfer: Standard Ethernet, Fast Ethernet, and Gigabit Ethernet.

Let's explore the three types of Ethernet in the following sections.

Standard Ethernet

The original standard Ethernet was introduced by using different cable arrangements. Standard Ethernet is divided into the following types:

- **10Base5**: Refers to thick coaxial cable carrying Ethernet signals. In 10base5, 10 refers to the transmission speed of the Ethernet (10 mbps), base refers to the baseband signaling, and 5 refers to the maximum segment length of the cable, which is 500 meters.
- **10Base2**: Refers to a thinner type of coaxial cable with Bayonet Neill-Concelman (BNC) connectors. It is also known as thinnet. The 10Base2 standard Ethernet was introduced after users experienced problems with 10Base5. Moreover, 10Base2 is more economical than 10Base5.
- **10BaseT**: Uses the Unshielded Twisted Pair (UTP) cable, which allows devices, such as a computer, to connect to the network. UTP is popular as it is easily installed, and is more reliable, flexible, and lighter than 10Base2 or 10Base5.
- **10BaseF***: Refers to a generic term that* consists of three types of standards, namely, 10BaseFL, 10BaseFB, and 10BaseFP. This family of Ethernet uses optical fiber cables.

Now that you have learned about Standard Ethernet, let's learn about Fast Ethernet in the next section.

Fast Ethernet

Fast Ethernet, as the name suggests, transfers data at a faster rate than Standard Ethernet. It can transfer data at the rate of 100Mbit/s, which is 10 times more than the speed of Standard Ethernet. The following are different types of Fast Ethernets:

- **100BaseT4**: Refers to the Fast Ethernet standard that uses insulated copper wires twisted in pairs. It uses all four pairs of wires in the cable. It is the first type to be introduced as Fast Ethernet.
- **100BaseTX**: Uses two pairs of UTP cables of a high grade to transfer data and uses the category 5 cable. This type of Fast Ethernet is commonly used in office networks.

- **100BaseFX**: Uses optical fiber as a medium. It is commonly used as a backbone for computer networks.
- **100BaseBX**: Uses a single wire of the UTP cable.

In the next section, you learn about the Gigabit Ethernet which has even faster data transmission rate as compared to Standard and Fast Ethernet.

Gigabit Ethernet

The data transfer rate of Gigabit Ethernet is much higher than that of Standard Ethernet or Fast Ethernet. In other words, it is 100 times faster than the original 10 Mbps Ethernet, that is, 1000 Mbps. The following are the different types of Gigabit Ethernet:

- **1000BaseT:** Refers to a standard type of Gigabit Ethernet that uses the UTP cable with category 5; however, category 5e or category 6 is more preferred
- **1000BaseLX:** Refers to a type of Gigabit Ethernet consisting of optical fiber that uses a longer wavelength

After learning about the types of Ethernet LAN, let's discuss the working of the Ethernet LAN next.

Working of Ethernet LAN

An Ethernet LAN uses a data transmission protocol known as Carrier-Sense Multiple Access /Collision Detection (CSMA/CD) to share and transfer information over a network. CSMA/CD is a set of protocols used to resolve and manage collisions of data that might occur during the transfer of data. CSMA/CD is standardized by IEEE as 802.3, and by ISO as 8802.3. CSMA/CD is an enhanced feature of Carrier-Sense Multiple Access /Collision Avoidance (CSMA/CA). The CSMA/CD protocol is located in the second layer (Data-Link layer) of the OSI model.

CSMA/CD is helpful to synchronize data transmission. Devices connected through Ethernet LAN use CSMA/CD as a base for transmitting data on a network. These devices are first connected to cables to access the CSMA/CD protocol. The device that has to transmit the data first senses or detects whether the transmitting medium is free or not, with the help of a carrier (a specified level used for the transmission of a frame). The detection of the carrier signifies that the transmitting medium is not free and the transmission is delayed until the carrier is free and a notification signal is sent to the device, while the non-detection of the carrier signifies that transmitting medium is free and the data frames can be transmitted. If two or more devices transmit the frames at the same time, collision occurs and these collisions are simultaneously detected by CSMA/CD. When a collision is detected, the device transmitting the frames waits for an indefinite period before retransmitting the frames. The process in which devices wait before transmitting the frames is known as backoff. A random number generated by the collision counter located on each device decides the period for which the device has to wait. After a backoff, the device involved in the collision broadcasts the data again. This whole process is continued until a carrier is not detected or sensed.

After learning about the working of Ethernet LAN, let's now learn the LAN card configuration in the next section.

LAN Card Configuration

A LAN card is a hardware device that allows computers to communicate with each other computers by using a wired medium or wirelessly. When you want to communicate with other computers or network devices in a network, you need to configure your LAN card on your existing system. LAN cards are also known as Ethernet cards.

Perform the following steps to configure the LAN card or Ethernet card in Linux:

1. *Type* the **system-config-network** command in the terminal window, as shown in Fig.AT-2.4:

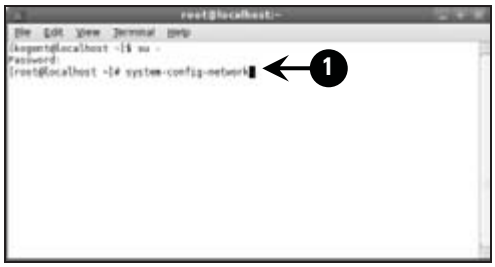


Fig.AT-2.4

2. *Press* the **ENTER** key

   The **Network Configuration** window appears, with the **Devices** tab selected by default (Fig.AT-2.5).

3. *Select* the **Hardware** tab to configure the Ethernet card. The **Hardware** tab opens (Fig.AT-2.6).



Fig.AT-2.5



Fig.AT-2.6

4. *Select* an Ethernet card that you wish to configure. In our case, we have selected **Intel Corporation 82566D** (Fig.AT-2.7).
5. *Click* the **Edit** button, as shown in Fig.AT-2.7:

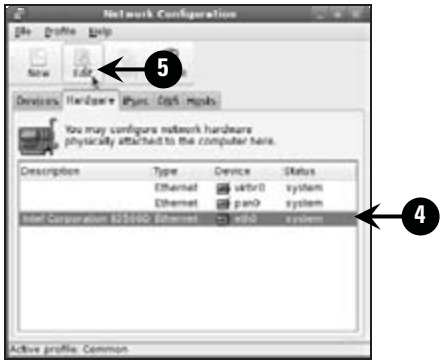


Fig.AT-2.7

The **Network Adapters Configuration** dialog box appears (Fig.AT-2.8).

If you have more than two Ethernet cards installed on your system, you can assign different device names to your Ethernet card.

6. *Click* the down arrow button beside the **Device** option. A drop-down list appears (Fig.AT-2.8).
7. *Select* any device name for your Ethernet card. In our case, we have selected **eth1** as the device name for the selected Ethernet card (Fig.AT-2.9).

8. *Click* the **OK** button, to close the Network Adapters Configuration dialog box (Fig.AT-2.9).

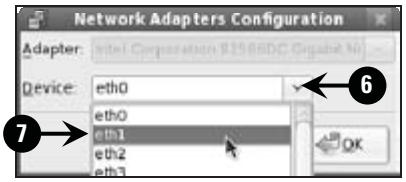


Fig.AT-2.8



Fig.AT-2.9

The Network Configuration window reappears (Fig.AT-2.10).

9. *Select* the **File** menu from the menubar (Fig.AT-2.11). A drop-down menu appears.
10. *Select* the **Save** option from the File menu to save the changes made in the Network Configuration window (Fig.AT-2.11).



Fig.AT-2.10



Fig.AT-2.11

As you select the Save option from the File menu a dialog box appears, informing you that the changes you made have been saved, and suggesting that you restart your computer (Fig.AT-2.12).

11. *Click* the **OK** button (Fig.AT-2.12).

The Network Configuration window reappears (Fig.AT-2.13).

12. *Select* the **File** menu from the Network Configuration window menu bar. A drop-down list appears (Fig.AT-2.13).
13. *Click* the **Quit** option from the drop-down list to quit from the Network Configuration window (Fig.AT-2.13).



Fig.AT-2.12

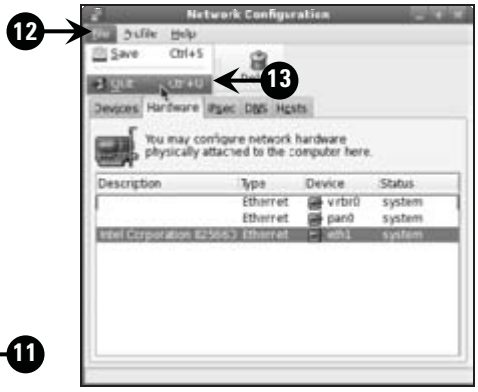


Fig.AT-2.13

The Network Configuration window closes.

After learning to configure the LAN card, let's now discuss the IP address.

Exploring the IP Address

When you have multiple computers on a network, you need to identify each uniquely. The address assigned to a computer in a network is known as its IP address. The IP address is a unique numerical address provided to the computers, and other devices for identification in the network. It is a unique 32-bit logically assigned binary number of four octets, which is represented in decimal notation and designated to a particular device. The hosts and routers (device used to determine the destination of a data packet) used in the TCP/IP protocol suite are identified by the IP address. The IP address is also divided into classes, and each class has its specific valid range. The IP address consists of the following two parts:

- **Network ID**: Identifies the network to which the host is connected. Network ID is the same for all the hosts on a particular network.
- **Host ID:** Identifies the host on the network. Host ID is different for different hosts on a network.

Table 2.2 shows the division of the IP address into Network ID and Host ID:

Table 2.2: Division of the IP Address

IP Address	Network ID	Host ID
192.168.75.38	192.168.75	38
130.11.45.90	130.11	45.90
125.25.210.12	125	25.210.12

Each pair of numbers written in decimal notation in an IP address is called an octet. In the example 192.168.75.38, 192 is the first octet, 168 is the second octet, 75 is the third octet, and 38 is the fourth octet. The following are the rules regarding the identification of an IP address:

- An IP address cannot be duplicated
- All host bits cannot be set to zero
- All host bits cannot be set to one
- The first octet cannot be taken as 127 because it is reserved as a loopback address (address that acts as a test mechanism for network devices and protocols).

An IP address is used as an ID to communicate on the network, similar to a student who requires an ID to get access to the services in the university. It is a basic protocol required to connect to the network. Generally, an IP address is assigned to the Network Interface Card (NIC) rather than to the computer. An IP address may be either permanent or temporary for a particular device. The following are the two types of IP addresses:

- **Dynamic IP address:** Refers to the IP address assigned to devices that require temporary connectivity to a network or those that communicate for a short period of time. Dynamic IP addresses use DHCP (Dynamic Host Control Protocol) to assign the IP address.
- **Static IP address:** Refers to an IP address assigned to a device that requires permanent connectivity on the network.

After learning about IP addresses, now let's discuss the classification of IP addresses.

Classification of IP Addresses

As already discussed, an IP address specifies a unique ID to a device to access a network. IP addresses are divided into five types of classes: A, B, C, D, and E. The first four bits of an IP address determines the class into which an IP address fits.

The following list shows the various IP address classes as per the variation in the first, second, third, or fourth bit of an IP address:

- If the first bit is zero, the IP address belongs to the Class A address
- If the first bit is one and the second bit is zero, the IP address belongs to the Class B address
- If the first two bits are one and the third bit is zero, the IP address belongs to the Class C address
- If the first three bits are one and the fourth bit is zero, the IP address belongs to the Class D address.
- If all the four bits are one, the IP address belongs to the Class E address.

Table 2.3 shows the classification of IP addresses:

Table 2.3: Types of IP Addresses

Classes	Net ID		Host ID
A	0	7 bit	24 bit
B	10	14 bit	16 bit
C	110	21 bit	8 bit
D	1110	multicast use	
E	11110	Reserved for future use	

Now, let's describe the five types of IP addresses, one by one.

Class A

Class A addresses are used when there are several hosts communicating on a large network. It uses the first octet in which the first bit is set to zero, and the other seven bits are set to one. Class A networks use the first 8-bits of the IP address to identify the network address, and the remaining 24-bits to identify the individual host. Class A has up to 224 different host IDs, which means that the network can have up to 16,777,214 hosts.

Class B

Class B addresses use the first two octets or 16-bits of an IP address to identify the network address and the remaining 16-bits or last two octets to identify the host ID or address. Class B has up to 216 different host IDs, which means a network can have a maximum of 16,384 Class B networks. Each Class B address can accommodate more than 65,534 hosts. Class B addresses are used in medium to large scale organizations.

Class C

The Class C addresses use the first three octets or 24-bits of an IP address for the network address and the remaining last octet or 8-bits to identify the host address. Class C has up to 28 different host IDs, so the network can have up to 254 hosts. Class C addresses are used in the IP addresses for LANs.

Class D

Class D addresses are not assigned to hosts but are designed for multicasting (or a one-to-many) communication. Each class in Class D defines a particular group of hosts on the Internet.

Class E

The Class E addresses are also not assigned to hosts. These types of addresses are not used for general applications, but are reserved for experimental purposes.

In addition to the preceding five types of IP addresses, there are the other types of IP addresses. These are:

- **Unicast IP address:** Helps in a one-to-one communication. It uniquely identifies a host in a particular network when a data packet is sent from the host to the destination address.
- **Multicast IP address:** Helps in a one-to-many communication, when a data packet from a host is sent to a group of hosts and not to a single destination address.
- **Broadcast IP address:** Helps in a one-to-all communication. It allows a data packet to be sent from a host to all other hosts on a network.

After learning about the IP addresses, let's now discuss the DHCP server in the next section.

Working with the Dynamic Host Control Protocol (DHCP) Server

The DHCP protocol automatically assigns IP addresses and other network configuration information, such as subnet mask and broadcast address, to computers on a network. DHCP is a protocol that dynamically assigns the IP addresses to clients. A client configured for DHCP sends a broadcast request to the DHCP server requesting for an address. The DHCP server then issues an IP address for a lease period. The time of a valid lease can be specified on the server. DHCP reduces the amount of time required to configure clients and allows you to move a computer to various networks, which can be configured with the appropriate IP address, gateway, and subnet mask. DHCP servers may assign a static IP address to any system on the network. Microsoft NetBIOS information is often included in the network information sent by the DHCP server.

In this section, you learn to install the DHCP server, configuring the DHCP server and assigning IP address at the client machine using the DHCP server.

Fig.AT-2.14 shows the structure of the DHCP server:

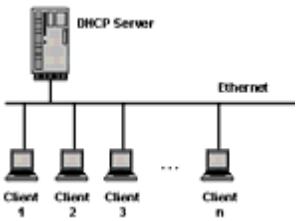


Fig.AT-2.14

Let's now learn to install the DHCP server.

Installing the DHCP Server

You need to install the DHCP server to assign the IP address to a client machine on a leased period.

Perform the following steps to install the DHCP server:

1. *Type* the **yum install dhcp** command in the terminal window (Fig.AT-2.15).
2. *Press* the **ENTER** key (Fig.AT-2.15).
   The installation process of the DHCP server starts (Fig.AT-2.15).
3. *Press* the **y** key of the keyboard to start the process of install and download packages for DHCP server (Fig.AT-2.16).
4. *Press* the **ENTER** key (Fig.AT-2.16).
   Now, the package manager downloads the required packages for the DHCP server installation (Fig.AT-2.16).

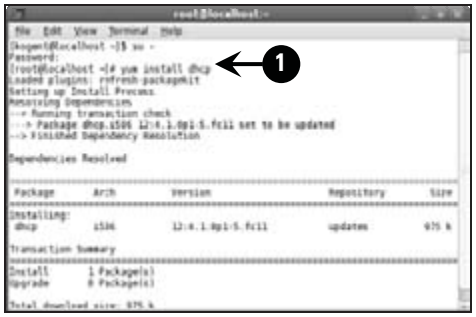


Fig.AT-2.15

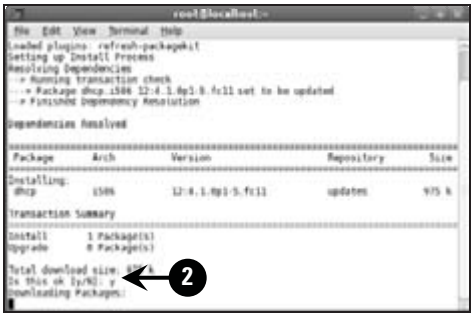


Fig.AT-2.16

When all the required packages are downloaded, the DHCP server installation is completed (Fig.AT-2.17).

5. *Click* the **Close Window** button from the **titlebar** of the terminal window to close the window (Fig.AT-2.18).



Fig.AT-2.17



Fig.AT-2.18

After installing the DHCP server in your system, let's now learn to configure and assign IP address at the client machine in the DHCP server.

Configuring and Assigning an IP Address at the Client Machine in DHCP Server

After installing the DHCP server, you need to configure the server. After configuring the DHCP server, you can use it to assign IP addresses to client machines.

Perform the following steps to configure the DHCP server in Fedora Linux:

1. *Type* the **gedit /etc/dhcp/dhcpd.conf** command in the terminal window, as shown in Fig.AT-2.19:



Fig.AT-2.19

2. *Press* the **ENTER** key.

   The DHCP server configuration file opens.

   You need to make the following changes in the DHCP configuration file to assign the IP address at the client machine, as shown in listing.AT-2.1:

Listing AT-2.1

```
ddns-update-style none;
ddns-updates off;
deny client-updates;
one-lease-per-client false;
allow bootp;
```

```
option T150 code 150 = string;
subnet 192.168.1.0 netmask 255.255.255.0 {
range 192.168.1.225 192.168.1.251;
default-lease-time 86400;
max-lease-time 86400;
option routers 192.168.1.2;
# option ip-forwarding off;
# Set the broadcast address and subnet mask
# to be used by the DHCP clients
option broadcast-address 192.168.1.255;
option subnet-mask 255.255.255.0;
# Set the DNS server to be used by the
# DHCP clients
option domain-name-servers 192.168.1.31;
# If you specify a WINS server for your Windows clients,
# you need to include the following option in the dhcpd.conf file:
option netbios-name-servers 192.168.1.31;
```

After configuring the DHCP server, you need to start the DHCP services.

3. *Type* the **service dhcpd start** command in the terminal window (Fig.AT-2.20).
4. *Press* the **ENTER** key (Fig.AT-2.20).

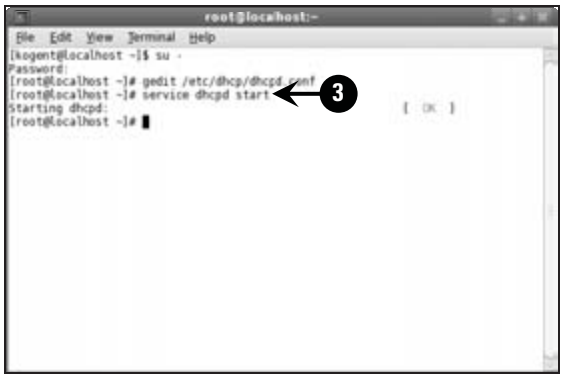


Fig.AT-2.20

The DHCP services start, as shown in Fig.AT-2.20.

After learning to install and configure the DHCP server, let's discuss the Domain Naming Services server in the next section.

Working with the Domain Naming Services (DNS) Server

DNS is a facility provided by the TCP/IP protocol that allows you to navigate to a website by using its name instead of using long and difficult IP address. It uses the client-server architecture and functions at the Application layer. Suppose the DNS servers are not available, and you want to search some information on the Internet by using Google. In that case, you need to type the IP address of Google, that is, 216.239.51.10, instead of simply typing www.google.com in the address bar of the browser.

Let's take an example to understand how a DNS works. Suppose you want to send an e-mail with the address abc@express.com. In this case, express.com is sent to a DNS client, which sends a request to a DNS server to verify the existence of the e-mail address and map it with its corresponding IP address. The DNS server, after mapping the address, sends the address back to the DNS client, and the browser displays the respective Web page as per the request. The DNS server uses the name space to define the name and the IP address of the hosts over a network.

Now, let's learn about name space and Domain name space in the following sections.

Name Space

A Name space defines how a domain name and its IP address are arranged in a system. It provides unique symbolic names to devices and specifies the number of characters (symbols) that a name can have. Each Name space uses a specific structure, which describes how names are constructed and interpreted. A Name space follows either the Flat name space structure or the hierarchical name space structure.

Let's now discuss the name space structures in the following sections.

Flat Name Space

In the Flat name space structure, each name is assigned a particular address. The Flat name space arranges the names and addresses in two separate columns. The drawback of this structure is that it cannot be used in large network.

Hierarchical Name Space

The Hierarchical name space structure is a tree-like structure that consists of various hierarchies, such as name, type, and department of an organization. In this structure, the central control and authority is assigned to one single hierarchy, which manages a group of other hierarchies.

Domain Name Space

The Domain name space is designed based on the Hierarchical name space. An inverted tree structure with the root at its top is shown in Fig.AT-2.21 Starting from 0 (root level) to 127 (highest level), a tree can have a maximum of 128 levels. The names in the DNS are not case-sensitive; for example, express is treated the same as Express or EXPRESS.

An example of Domain name space is shown in Fig.AT-2.21:

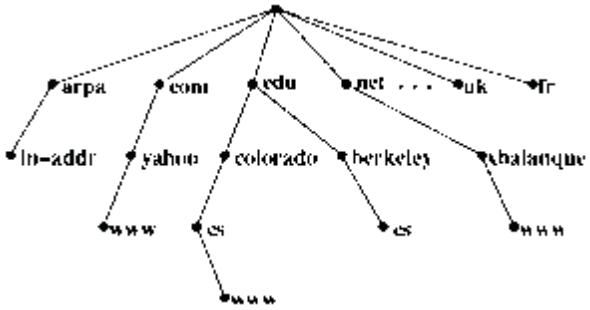


Fig.AT-2.21

By default, the DNS settings are stored in the /etc/resolv.conf directory. You can edit these settings by using the vi editor.

Configuring the DNS Server

The configuration settings of the DNS server reside in the /etc/resolv.conf directory by default. You can manually configure the DNS server by opening the configuration file in the vi editor.

Perform the following steps to configure the DNS server:

1. *Type* the **vi /etc/resolv.conf** command in the Terminal window (Fig.AT-2.22).
2. *Press* the **ENTER** key (Fig.AT-2.22).
   The DNS configuration file is opened in the vi editor (Fig.AT-2.23).



Fig.AT-2.22

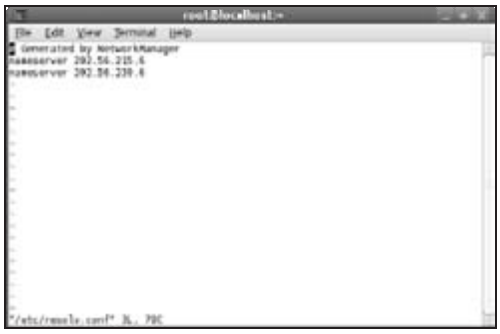


Fig.AT-2.23

3. *Press* the **INSERT** key and *type* the nameserver that you want to connect to your computer. In our case, we have typed two nameservers, **192.168.1.35** and **192.168.1.36** (Fig.AT-2.24).
4. *Press* the **ESC** key to exit from insert mode.
5. *Press* the **SHIFT** + **colon (:)** key combination, and *type* the **wq** command to save the changes and quit from the vi editor (Fig.AT-2.25).
6. *Press* the **ENTER** key (Fig.AT-2.25).

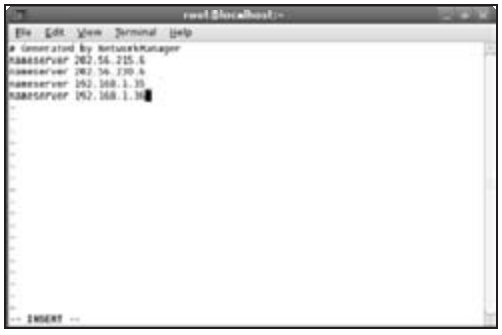


Fig.AT-2.24

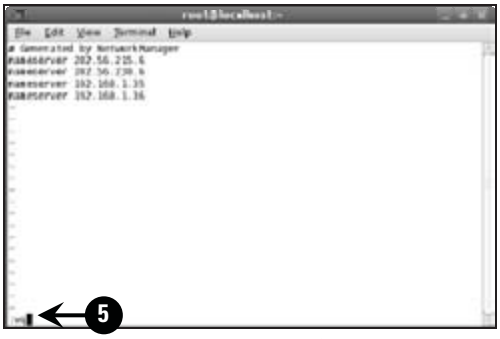


Fig.AT-2.25

The Terminal window is displayed (Fig.AT-2.26).

7. *Type* the **Ping** command and the IP address of your system to check the connectivity between the hosts on the network (Fig.AT-2.27).
8. *Press* the **ENTER** key (Fig.AT-2.27).

   The DNS server is configured, now you are able to access another hosts or gateways (Fig.AT-2.27).



Fig.AT-2.26

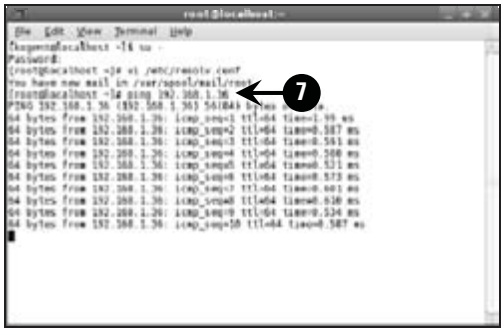


Fig.AT-2.27

After configuring the DNS server, let's now learn about the Samba File server in the next section.

Working with the Samba File Server

The Samba File server is a server that allows all the network users to access file system on a network with computers that use the Server Message Block (SMB) protocol or Common Internet File System (CIFS) protocol. You can download the Samba software package if it is not available with your Linux distribution from the www.samba.org site. In this section, you learn about sharing files with the Samba File server.

Sharing Files with the Samba File Server

The Samba file server allows you to share files from the source server across the network.

Perform the following steps to share a file by using the Samba File server:

1. *Select* the **System** menu from the Menu bar. A drop-down list appears (Fig.AT-2.28).
2. *Select* the **Administration** option from the drop-down list. A submenu appears (Fig.AT-2.28).
3. *Select* the **Samba** option from the submenu, as shown in Fig.AT-2.28:

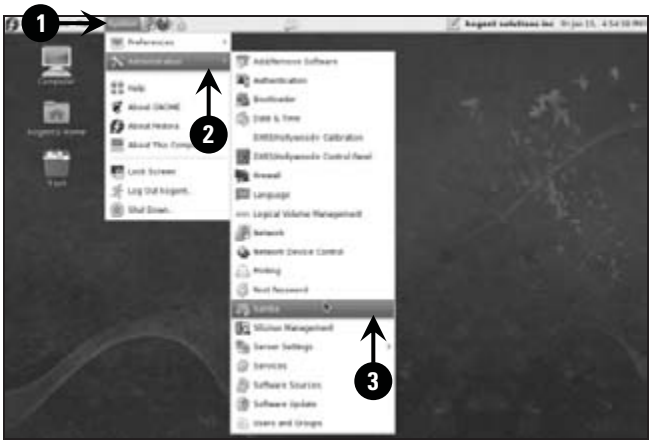


Fig.AT-2.28



As you select the Samba option from the drop-down list, a dialog box appears that ask for root password. You need to enter the root password in the dialog box.

The **Samba Server Configuration** window appears (Fig.AT-2.29).

4. *Click* the **Add Share** button from the Toolbar of the **Samba Server Configuration** window (Fig.AT-2.29).

   The **Create Samba Share** window appears (Fig.AT-2.30).

5. *Select* the **Browse Share** button (Fig.AT-2.30).



Fig.AT-2.29



Fig.AT-2.30

The **Select Directory** dialog box appears (Fig.AT-2.31).

6. *Select* the desired directory that you want to share. In our case, we have selected the **/tmp** directory (Fig.AT-2.31).
7. *Click* the **OK** button, as shown in Fig.AT-2.31:

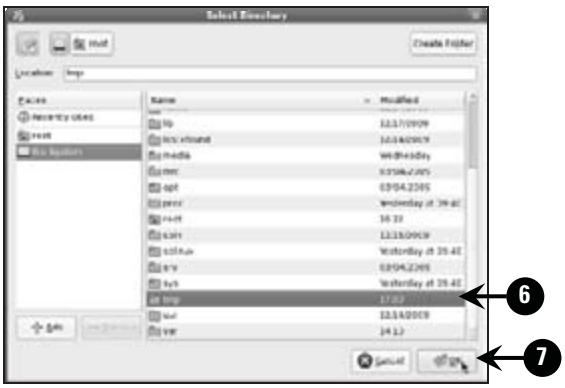


Fig.AT-2.31

The **Create Samba Share** window reappears (Fig.AT-2.32).

8. *Select* the **Writable** and the **Visible** check boxes (Fig.AT-2.32).
9. *Select* the **Access** tab in the **Create Samba Share** window, as shown in Fig.AT-2.32:

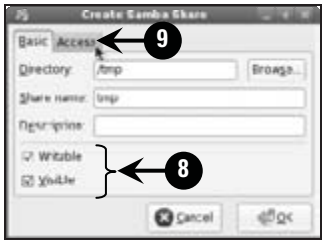


Fig.AT-2.32

The Access tab opens (Fig.AT-2.33).

10. *Select* the **Allow access to everyone** radio button (Fig.AT-2.34).
11. *Click* the **OK** button (Fig.AT-2.34).



Fig.AT-2.33



Fig.AT-2.34

The Samba Server Configuration window reappears, displaying that the selected directory is now shared (Fig.AT-2.35).

12. *Click* the **Close Window** button from the **Title** bar of the Samba Server Configuration window to close the window, as shown in Fig.AT-2.35:

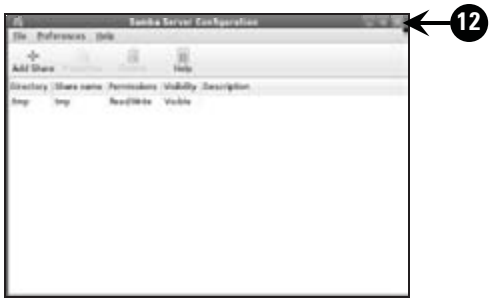


Fig.AT-2.35

After sharing file with the Samba server, now let's learn how to access Samba share from Windows Vista.

Accessing Samba Share from Windows Vista

In Samba server, you can access a shared folder or directory on Microsoft Windows, such as Windows Vista/XP. You can also access the contents of the file or folder that you have shared.

Perform the following steps to access the Samba share from Windows Vista:

1. *Click* the **Start** button. A Start menu appears (Fig.AT-2.36).
2. *Select* the **Network** option from the Start menu (Fig.AT-2.36).
   The Network window appears (Fig.AT-2.37).
3. *Type* **\\192.168.1.36** in the address bar of the Network window (Fig.AT-2.37).
4. *Press* the **ENTER** key (Fig.AT-2.37).



Fig.AT-2.36



Fig.AT-2.37

The **Connect to 192.168.1.36** dialog box appears (Fig.AT-2.38).

5. *Type* the user name in the **User name** text box. In our case, we have typed **kogent** (Fig.AT-2.39).
6. *Type* the password in the **Password** text box (Fig.AT-2.39).
7. *Click* the **OK** button (Fig.AT-2.39).



Fig.AT-2.38

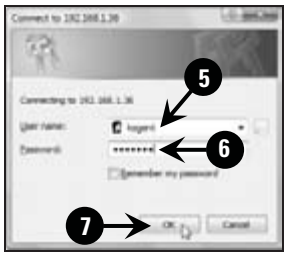


Fig.AT-2.39

The shared directory of the **\\192.168.1.36** computer opens, as shown in Fig.AT-2.40:



Fig.AT-2.40

You can see the tmp directory of \\192.168.1.36 computer that you can access from the Windows Vista.

After learning how to configure the Samba file server and use the server to share files as well as access Windows Vista, let's now learn how to work with the FTP server.

Working with the FTP Server

The FTP server is a software application that runs FTP and transfers files over the internet. It is used to either download a file from the server or upload a file to the server. An FTP server authenticates users that request to use it. You can configure your FTP server to accept requests only from users who have an account on the system running the FTP server. Alternatively, you can configure the FTP server to accept requests from anyone with the help of service known as anonymous FTP. In this section, you learn to install the FTP server, configure the FTP server, and access the FTP server with the client computer.

Let's begin by learning to install the FTP server.

Installing the FTP Server

The FTP server provides a secure way for sharing files by using the client-server model. The Linux operating system uses the Very Secure FTP Daemon (vsftpd) command to install the FTP server. Before using the FTP server, you need to first install it.

Perform the following steps to install the FTP server:

1. *Open* the Terminal window and enter into root mode.
2. *Type* the **yum install vsftpd** command in the Terminal window (Fig.AT-2.41).
3. *Press* the **ENTER** key to set up the FTP server installation process (Fig.AT-2.41).
4. *Press* the **y** key to confirm the downloading of the FTP packages (Fig.AT-2.42).

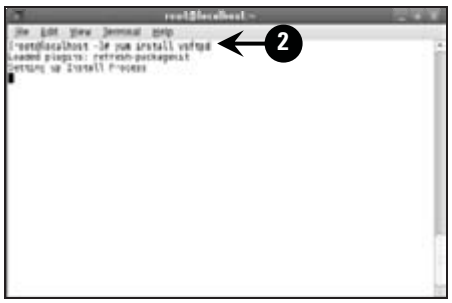


Fig.AT-2.41

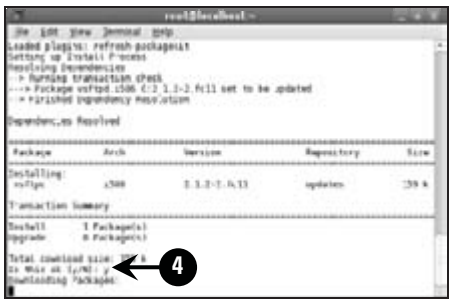


Fig.AT-2.42

The FTP server is installed in just few minutes, as shown in Fig.AT-2.43:



Fig.AT-2.43

After installing the FTP server, let's now learn to configure the FTP server.

Configuring the FTP Server

When you configure the FTP server, the vsftpd.conf file is used. It is the FTP server configuration file, which is stored in the /etc directory. You need to edit this file to configure the server by using a text editor, such as vi.

Perform the following steps to configure the FTP server:

1. *Type* the **vi /etc/vsftpd.conf** command in the Terminal window (Fig.AT-2.44).
2. *Press* the **ENTER** key (Fig.AT-2.44).

   The vsftpd configuration file opens (Fig.AT-2.45).



Fig.AT-2.44



Fig.AT-2.45

3. *Press* the **Insert** key from the keyboard to enter into the insert mode (Fig.AT-2.46).
4. *Type* **pasv_max_port=1024** under the **tcp_wrappers=Yes** text (Fig.AT-2.46).
5. *Type* the **local_root=/home/kogent/download** syntax under the **pasv_max_port=1024** text, as shown in Fig.AT-2.46:

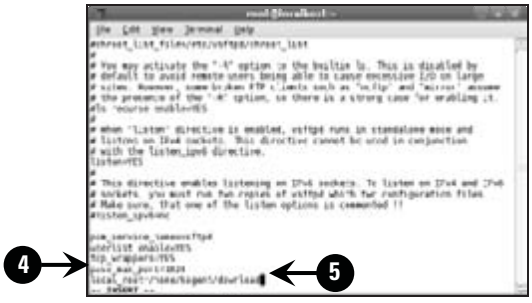


Fig.AT-2.46

6. *Press* the **ESC** Key.
7. *Press* the **SHIFT**+ colon **(:)** key combination and type wq for saving changes made in the configuration file (Fig.AT-2.47).

   As soon as you type the :wq command on the editor window, the configuration file is saved, and you quit from the editor window and go back to the command prompt window (Fig.AT-2.47).
8. *Type* **/etc/init.d/vsftpd restart** to restart the FTP services (Fig.AT-2.48).
9. *Press* the **ENTER** key (Fig.AT-2.48).

   The FTP services are restarted (Fig.AT-2.48).



Fig.AT-2.47

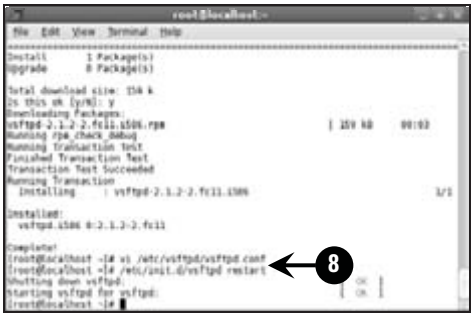


Fig.AT-2.48

After configuring the FTP server, let's now learn to access the FTP server with a client computer.

Accessing the FTP Server with a Client Computer

You can access the FTP server with a client computer by using the FTP server to upload and download a file.

Let's perform the following steps to access the FTP server with a client computer:

1. *Click* the **Mozilla Firefox** icon from the top of the Linux desktop, as shown in Fig.AT-2.49:



Fig.AT-2.49

   The Fedora Project-Start Page-Mozilla Firefox window appears (Fig.AT-2.50).
2. *Type* the **ftp 192.168.1.31** address in the address bar of the Mozilla Firefox window, as shown in Fig. AT-2.50:



Fig.AT-2.50

3. *Press* the **ENTER** key. The Authentication Required dialog box appears (Fig.AT-2.51).
4. *Type* the username beside the User Name text box. In our case, we have typed **kogent** (Fig.AT-2.51).
5. *Type* the password for the kogent user beside the **Password** text box (Fig.AT-2.51).
6. *Click* the **OK** button, as shown in Fig.AT-2.51:

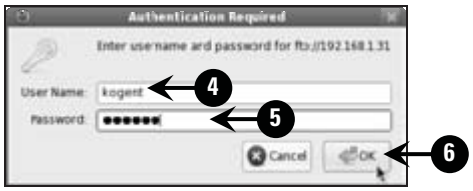


Fig.AT-2.51

You are now connected with the FTP server 192.168.1.31 (Fig.AT-2.52).

7. *Click* the **Close Window** button from the Title bar of the **Mozilla Firefox** window to close it, as shown in Fig.AT-2.52:



Fig.AT-2.52



You need to ensure that the system firewall settings are on and it is not blocking the port.

After learning about FTP server, let's now learn about the Telnet server.

Introducing Telnet Server

Telnet server is a program that helps a user of one computer to access another computer remotely. It is a terminal emulation program for TCP/IP networks, such as the Internet. The computer that you use to access another computer must be a Telnet client to access the computer from the Telnet server. Through Telnet, an administrator or another user can access any computer remotely. When a Telnet client establishes a connection with the remote host, the client becomes a virtual terminal, which allows you to communicate with the remote host from your computer. The HTTP and FTP protocols allow you to upload and download specific files from the remote computers on the Web, without actually logging on to the remote computer. With Telnet, when you log on as a regular user to access a remote computer, your user privileges remain unchanged. Usually Telnet runs on TCP/IP port 23. You need to type the Telnet command, followed by the IP address of the remote computer, at the command prompt to access a computer remotely. For example:

```
Telnet 192.168.1.30
```

After entering the preceding command, you are prompted to enter the user id and password in that computer. You can access the computer remotely after entering the user id and password.

In the next section, you learn to install and access the Telnet server.

Installing and Accessing the Telnet Server

Before accessing the remote host from the Telnet client, you need to install the Telnet server on the remote host.

Let's perform the following steps to install the Telnet server in Linux (Fedora 11 distribution):

1. *Enter* into root mode and then, *Type* the command **yum install telnet-server** in the Terminal window (Fig.AT-2.53).
2. *Press* the **ENTER** key.

   The package manager checks for package dependencies, displays the total downloading size of the packages, and asks you whether it is ok or not.
3. *Press* the **y** key from the keyboard to confirm to start the process of downloading and installing the package (Fig.AT-2.54).



Fig.AT-2.53

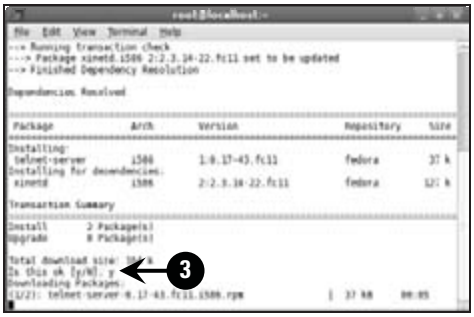


Fig.AT-2.54

4. *Press* the **ENTER** key. The Telnet server is installed (Fig.AT-2.55).
5. *Type* the **/sbin/chkconfig –-list telnet** command to check the status of the Telnet server (Fig.AT-2.56).
6. *Press* the **ENTER** key. Note that the Telnet services are off by default (Fig.AT-2.56).
7. *Type* the **/sbin/chkconfig - - level 35 telnet on** command to turn on the Telnet server (Fig. AT-2.56).



Fig.AT-2.55

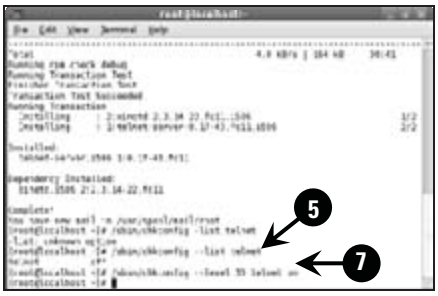


Fig.AT-2.56

8. *Press* the **ENTER** key. The Telnet server is turned on (Fig.AT-2.57).
9. *Re-Type* the **/sbin/chkconfig - -list telnet** command to see whether the Telnet services are on or not (Fig.AT-2.57).
10. *Press* the **ENTER** key. The Telnet server is now on, as shown in Fig.AT-2.57:

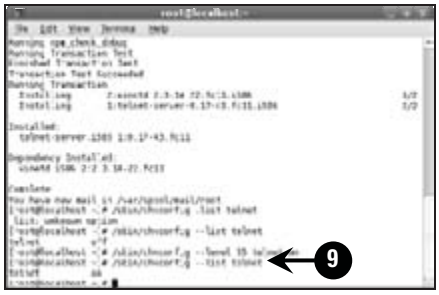


Fig.AT-2.57

Let's now learn to access the client computer with telnet.

Accessing the Client Computer with Telnet

You can access the client computer from your PC by typing the telnet command followed by computer name or IP address of the client computer.

Let's perform the following steps to access the client computer through the telnet command:

1. *Type* the **telnet** command along with the **IP address** of the user computer that you want to access in the Terminal window. In our case, we have typed 192.168.1.219 (Fig.AT-2.58).
2. *Press* the **ENTER** key. Now, you are connected to the specified computer (Fig.AT-2.58).
3. *Type* the user name beside **login.** In our case, we have typed **kogent** as user name (Fig.AT-2.59).
4. *Type* the user password beside password. The password that we typed is not visible (Fig.AT-2.59).
5. *Press* the **ENTER** key. You are now access the client computer (Fig.AT-2.59).

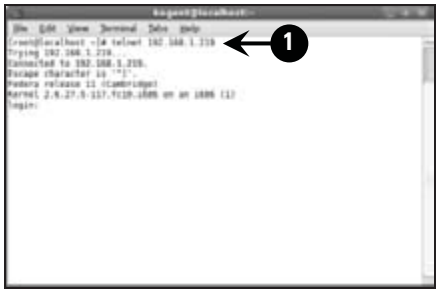


Fig.AT-2.58

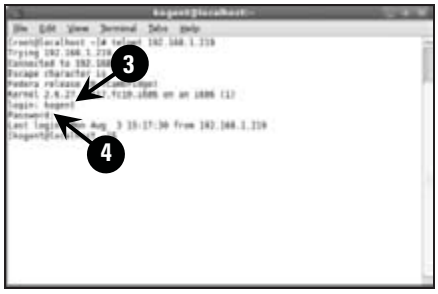


Fig.AT-2.59

After learning about the Telnet server, let's now learn to work with the Web server.

Web Server

A Web server provides the ability to host websites on the Web or take advantage of web based applications.. In Fedora 11, the Apache Web server is one of the most popular freely available Web servers. It has many features, such as filtering and multiprotocol support, that make it very extensible and useful for different types of Web sites. The Apache Web server is used for personal and enterprise-level Web pages.

The Apache HTTP server is used to develop and maintain an open-source HTTP server for modern operating systems including UNIX. The Apache Web server is a secure, efficient, and extensible server that provides HTTP services.

In this section, you learn to install the Apache Web server and host a Web page through it.

Installing the Apache Web Server

You need to install the Apache Web server to create your own Web page in Linux. Let's perform the following steps to install the Apache Web server:

1. *Type* the **sudo yum install httpd** command in the Terminal window to install the Web server in Linux (Fig.AT-2.60).
2. *Press* the **ENTER** key.

   The package manager checks for package dependencies and displays the upgraded package(s) (Fig.AT-2.61).



Fig.AT-2.60

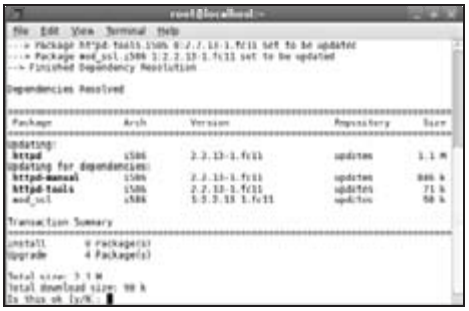


Fig.AT-2.61

3. *Press* the **y** key from the keyboard when asked to confirm the installation of the Web server (Fig. AT-2.62).
4. *Press* the **ENTER** key (Fig.AT-2.62).

   The installation of the Web server continues, and the remaining packages, dependencies, and updates for the Web server are downloaded, as shown in Fig. AT-2.62:

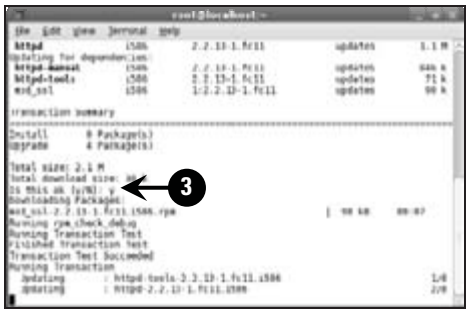


Fig.AT-2.62

In few minutes, the installation of the Apache Web server is completed.

After installing the Apache Web server, let's now learn to host a Web page using the Apache Web server.

Hosting a Web page through the Apache Web Server

You can host the Web page through the Apache Web server. You do not need to enter the address of the Web page again in the address bar of the Web browser, as it retrieves the file reference from the Apache Web pages records. The default location of the Apache Web server file is /var/www/html/index.html.

Let' perform the following steps to host a Web page using the Apache Web page:

1. *Select* the **Applications** menu from the top panel of GNOME desktop. A drop-down list appears (Fig.AT-2.63).
2. *Select* the **Accessories** option from the drop-down menu. A sub-menu appears (Fig.AT-2.63).
3. *Select* the **Text Editor** option from the sub-menu, as shown in Fig.AT-2.63:

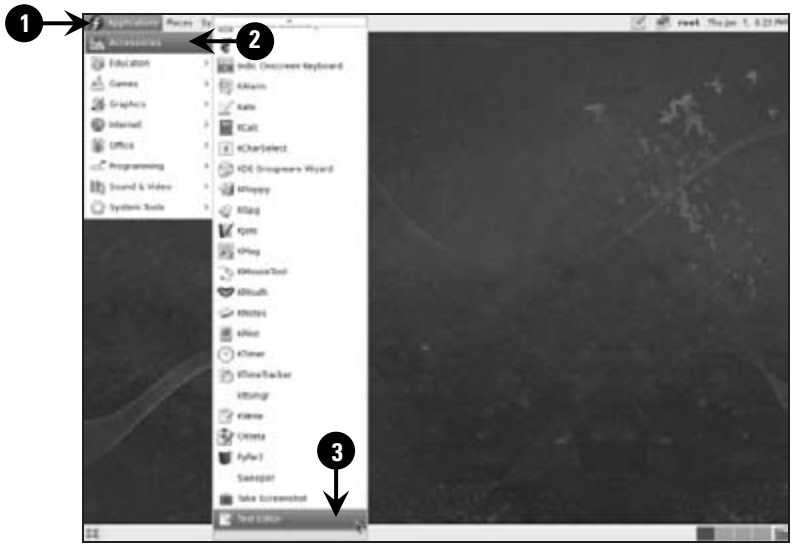


Fig.AT-2.63

The gedit text editor appears (Fig.AT-2.64).

4. *Type* the text that you want to see on the Web page in the text editor window. In our case, we have typed **Welcome to the world of Apache Web server** (Fig.AT-2.64).
5. *Click* the **Save** button, as shown in Fig.AT-2.64:

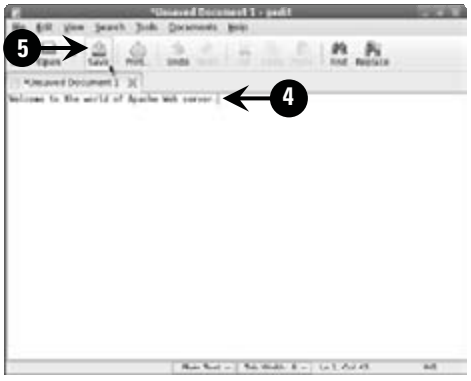


Fig.AT-2.64

The **Save As** dialog box appears (Fig.AT-2.65).

6. *Select* the location from the **Places** pane to save the file at the required location. In our case, we have selected the **File System** location (Fig.AT-2.65).

   A list of folders present in the **File System** location appears (Fig.AT-2.66).

7. *Select* the **var** folder (Fig.AT-2.66).



Fig.AT-2.65

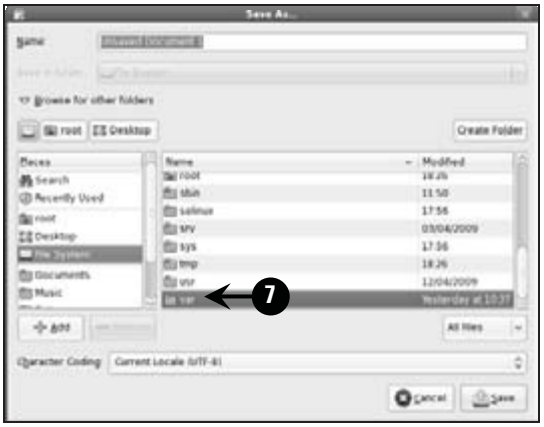


Fig.AT-2.66

A list of folders present in the **var** folder appears (Fig.AT-2.67).

8. *Select* the **www** folder (Fig.AT-2.67).

   A list of folders present in the **www** folder appears (Fig.AT-2.68).

9. *Select* the **html** folder (Fig.AT-2.68).



Fig.AT-2.67



Fig.AT-2.68

Files present in the **www** folder appear (Fig.AT-2.68).

10. *Select* the **index**.**html** file (Fig.AT-2.69).
11. *Click* the **Save** button (Fig.AT-2.69).

    The file is saved with the specified name (Fig.AT-2.70).

12. *Click* the **Close** icon to close the file (Fig.AT-2.70).



Fig.AT-2.69

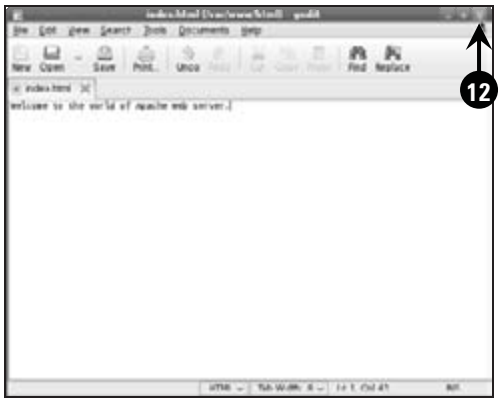


Fig.AT-2.70

13. *Open* the **Web browser** window. In our case, we have opened the **Mozilla Firefox** window (Fig.AT-2.71).
14. *Type* the **http://localhost/** address in the address bar of the Mozilla Firefox window, as shown in Fig.AT-2.71:



Fig.AT-2.71

15. *Press* the **ENTER** key. The Web page with the typed content appears, as shown in Fig.AT-2.72:



Fig.AT-2.72

After learning about the Web server and its installation process, let's now learn about the Squid proxy configuration.

Introducing the SQUID Proxy Configuration

Squid is a caching proxy for the Web, which supports various protocols, such as Hypertext Transfer Protocol (HTTP) and FTP. It reduces bandwidth and improves response time by caching and reusing frequently-requested Web pages. Squid has extensive access controls and can speed up the server. The Squid proxy server can be run on various operating systems, such as Linux and Windows. Squid is used to control the Web pages usage and protect from the accessing unauthorized websites.

You can implement Squid over the network on any system, which acts like a gateway for the Internet service. The Linux distribution usually has a packaged version of Squid. The /etc/squid/squid.conf file is used to configure the Squid configuration file for your Squid proxy server. Squid uses the configuration file named **squid.conf**, which is usually located in the **/etc/squid** directory. You can access the proxy server by the IP addresses of the computer or by a subnet of IP addresses. Squid runs on the default port 3128, which may be changed if required.

Let's perform the following steps to configure the Squid proxy:

1. *Type* the **vi /etc/squid/squid.conf** command in the Terminal window (Fig.AT-2.73).
2. *Press* the **ENTER** key. The Squid configuration file appears (Fig.AT-2.73).



Fig.AT-2.72



Fig.AT-2.73

You need to edit the file to set the proxy.

3. *Press* the down arrow key from the keyboard until the access control list appears (Fig.AT-2.74).
4. *Press* the **INSERT** key. The editor opens in the Insert mode and allows you to insert the required text in the file.
5. *Type* **acl mynetwork src 192.168.1.0/255.255.255.0 (for client)** to set the proxy on their machine (Fig.AT-2.75).
6. *Type* **acl mynetwork src 192.168.1.35-192.168.1.36/255.255.255.0 (range of IP addresses)** to set the proxy on the specified machines (Fig.AT-2.75).

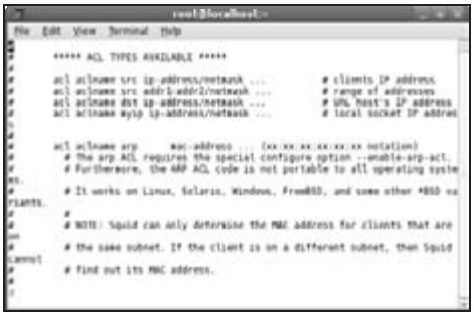


Fig.AT-2.74

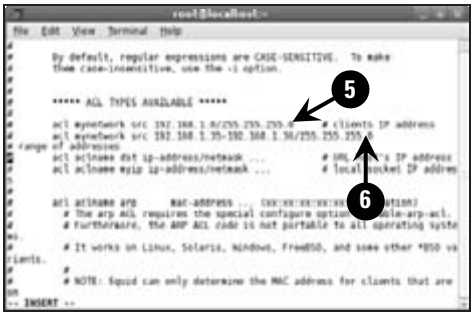


Fig.AT-2.75

7. *Type* **http_port 192.168.1.36:3128** under the default section to apply the proxy on the specified machine (Fig.AT-2.76).
8. *Add* the access control list named "mynetwork" to the http_access list by typing the **http_access allow mynetwork** line (Fig.AT-2.77).

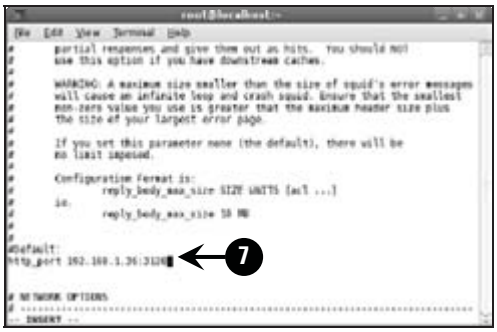


Fig.AT-2.76



Fig.AT-2.77

9. *Press* the **ESC** key and then **SHIFT + colon** (:) key combination and type the **wq** command (Fig.AT-2.78)
10. *Press* the **ENTER** key to save the changes made in the Squid configuration file and quit it (Fig.AT-2.78).

    Now, you are back at the command mode (Fig.AT-2.79).



Fig.AT-2.78



Fig.AT-2.79

11. *Type* the **/etc/rc.d/init.d/squid start** command to start the squid service (Fig.AT-2.80).
12. *Press* the **ENTER** key. The Squid services are now started, as shown in Fig.AT-2.80:



Fig.AT-2.80

After configuring the squid proxy server on the machine, let's now learn to assign a proxy on the client machine.

Assigning a Proxy on the Client Machine

A proxy server mediates connections between two or more computers, to increase both security and privacy in the network. You can assign a proxy on the client machine by using the Squid proxy server.

Let's perform the following steps to assign proxy on a client machine using the Squid proxy server:

1. *Click* the **Mozilla Firefox** icon from the top panel of the GNOME desktop, as shown in Fig.AT-2.81:



Fig.AT-2.81

The Mozilla Firefox window appears (Fig.AT-2.82).

2. *Select* the **Edit** menu from the menubar. A drop-down list appears (Fig.AT-2.82).
3. *Select* the **Preferences** option from the drop-down list, as shown in Fig.AT-2.82:



Fig.AT-2.82

The **Firefox Preferences** window appears (Fig.AT-2.83).

4. *Select* the **Advanced** tab from the Firefox Preferences window (Fig.AT-2.83).
   The **Advanced** tab appears (Fig.AT-2.84).
5. *Click* the **Settings** button beside the **Connection** option (Fig.AT-2.84).



Fig.AT-2.83



Fig.AT-2.84

   The **Connection Settings** dialog box appears (Fig.AT-2.85).
6. *Select* the **Manual proxy configuration** radio button (Fig.AT-2.85).
7. *Type* the **IP** address beside the HTTP Proxy text box. In our case, we have entered **192.168.1.36** (Fig.AT-2.85).
8. *Enter* the port number beside the Port spin box. In our case, we have entered **3128** (Fig.AT-2.85).
9. *Select* the **Use this proxy server for all protocols** check box under the **HTTP Proxy** section (Fig.AT-2.85).
10. *Click* the **OK** button (Fig.AT-2.85).
    The **Firefox Preferences** window re-appears (Fig.AT-2.86).
11. *Click* the **Close** button to close the Firefox Preferences window (Fig.AT-2.86).

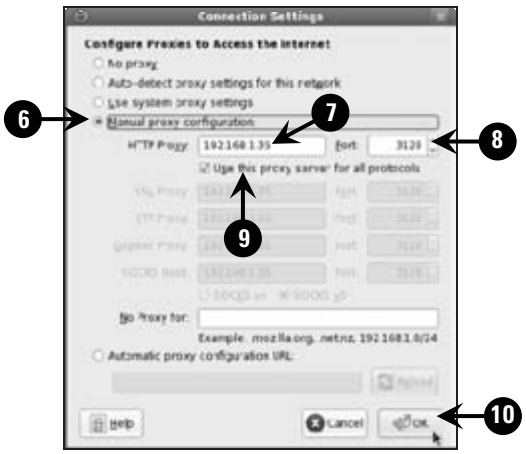


Fig.AT-2.85

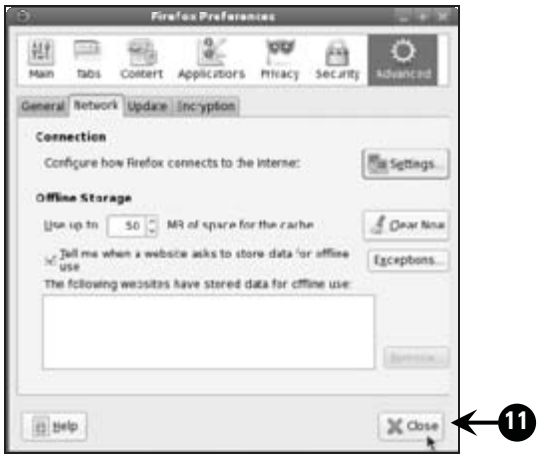


Fig.AT-2.86

12. *Click* the **Mozilla Firefox** icon from the top of the Linux desktop, as shown in Fig.AT-2.87:



Fig.AT-2.87

13. *Type* the **google.com** address in the address bar of the Mozilla Firefox window (Fig.AT-2.88).
14. *Press* the **ENTER** key. The **Google's** home page appears (Fig.AT-2.89).



Fig.AT-2.88



Fig.AT-2.89

The proxy setting is applied to the client machine 192.168.1.36 machine.

You need to ensure that the Firewall settings are properly configured. In case the address of some website is listed under restricted website listing, you will not be able to open the website. For example, if the address of Gmail website (http://www.gmail.com) is listed as restricted website in the Firewall settings, you will see an error message in the Web browser window, as shown in Fig.AT-2.90:



Fig.AT-2.90

After learning how to assign a proxy, let's now learn about the mail server.

Introducing Mail Server in Fedora Linux

E-mail allows a user to send electronic messages and data over the Internet. They are one of the commonly used application services for transaction of the data. You need to install the appropriate mail server on your system to send data over the network. This is a fast and better way to transfer data over the network. Linux Fedora 11 supports two types of mail server named as qmail server and cyrus-imap server.

Let's now learn about the qmail and cyrus-imapd servers one by one.

Introducing qmail server

The qmail server is the Internet Mail Transfer Agent (MTA) for the Unix-like operating system. qmail uses the Simple Mail Transfer Protocol (SMTP) to transfer massages with the MTA's on the other system. It is a secure, reliable, simple, and efficient message transfer agent.

Introducing Cyrus-imapd Server

Internet Message Control Protocol (IMAP) enables a user to work with the e-mail on the server. . The IMAP protocol is mainly used to create and delete e-mail messages. It is useful for the small-to-large enterprise environments using standard-based Internet mail technologies.

Let’s summarize the main points of this chapter.

Summary

In this chapter, you have learned about the Transmission Control Protocol/Internet Protocol (TCP/IP) network. Next, you have learned about the Ethernet LAN and the working of the Ethernet LAN. Further, you have learned about the LAN card configuration. You have also learned about IP addressing, DHCP, and DNS servers. Next, you have learned about the Samba File, FTP, Telnet, Web servers. In addition, you have learned about the Squid proxy configuration. Finally, you have learned about the mail server in Fedora Linux.

CHAPTER

3

Introducing Security in Linux

In this Chapter:

- Exploring Security Checklist in Linux
- Exploring Password Protection
- Monitoring Log Files
- Understanding Secure Shell Tools in Fedora
- Exploring Security Enhanced Linux (SELinux)

Security of data is the basic concern of any organization. A system that has insecure configuration can act as the storage of pirated data. Today, there are number of tools that act as a weapon against the malicious users and turn the insecure items to secure items. The goal of securing your system is to protect the stored data from theft, corruption, and tampering. In other words, system security refers to defining the methods to prevent the data from the unauthorized access. You can have your Linux system secure by using Security Enhanced Linux (SELinux), that comes built-in with Fedora Linux versions. The other ways to protect your system is to have a strong password or to install the SSH tools and services on your system. You can monitor the progress of your system by viewing the log files, which consists of the information related to different programs.

In this chapter, you learn about security checklist. You also learn how to change the password of general user as well as the root user. Further, you learn how to monitor the log files and become familiar with the SSH tool and its commands. Toward the end of the chapter, you explore the concept of SELinux.

Let's explore the checklist for security in Linux.

Exploring Security Checklist in Linux

Linux is considered one of the most secure operating system used by organizations to maintain large databases. You can work with Database Management System (DBMS) easily and efficiently. Linux provides you with many security tools to protect your system; however, slight carelessness from your side can hamper the data stored on your system. As none of the security measures is completely reliable; therefore, Linux provides you some of the following security features using which you can protect the data:

- **Users and Passwords:** Let you create different users with different permissions to access your system in order to protect the data and prevent it from malicious users. You can also create passwords, such as in BIOS, to restrict any other user from booting your computer.
- **Software Updates:** Let you install updates, such as apt and yum, since Linux is an open source software and vulnerabilities and bugs can cause hindrance in proper functioning of the software packages.
- **Access Limit to Services:** Let you restrict access to some services according to the requirement. For example, if your system is connected to Local Area Network (LAN) as well as to Internet, you can offer different services to both. **Root User Protection: Runs** commands either as a general user or use sudo commands in order to protect root user. A separate password for root user helps to secure the system.
- **Setting File Permissions:** Let you set the read, w**rite, and execute perm**issions for files and directories.
- **System Check:** Lets you check the system against the security measures, such as access to ports using nmap, provided by Linux.
- **System Monitor:** Lets you track all the activities of your system, such as log files.
- **Restrictive Firewalls:** Let you allow or deny the service requests that come from a network.

Let's now explore the password protection utility of Linux.

Exploring Password Protection

Password is the most common and basic utility of any operating system. It can be a word, phrase, or a string of characters. Using a strong password is important because it is the feature that is most commonly hacked.

The following are some of the key points to be remembered while selecting a password:

- An ideal password is a combination of numbers, letters, and symbols
- Password should not be any dictionary word, name of the person, or date of birth
- The ideal length of the password can be 10 or more characters

Earlier in the UNIX operating system, passwords are encrypted by using **trapdoor algorithm** and stored in a file, which can be read by every user but can only be modified by the root user. Nowadays, Linux

supports shadow password file, by default. The shadow password file is an enhancement of the **passwd** file and can be read only by the root user. The shadow password file is named as **passwd** and is present in the **/etc** directory.

In the following sections, you learn to change the password for a general user as well as for the root user.

Let's learn how to change the general user's password.

Changing General User's Password

In Linux, many users can log into a same system. These users are referred to as the general user and have limited authorization to access a system. Different settings can be applied for a system by different user accounts. You can protect your configured settings and the data by applying a password to your user account. An applied password can be modified as and when required.

Perform the following steps to change the password for the general user:

1. *Click* the **System** menu from the Menu bar. A drop-down menu appears (Fig.AT-3.1).
2. *Select* the **Administration** option. A sub-menu appears (Fig.AT-3.1).
3. *Click* the **Users and Groups** option, as shown in Fig.AT-3.1:



Fig.AT-3.1

A **Query** dialog box appears (Fig.AT-3.2).

4. *Type* the root password in the **Password** textbox (Fig.AT-3.2).
5. *Click* the **OK** button, as shown in Fig.AT-3.2:

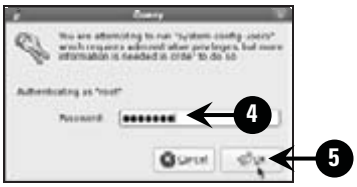


Fig.AT-3.2

A **User Manager** window appears (Fig.AT-3.3).

6. *Click* the **kogent** user (Fig.AT-3.3).
   The **kogent** user is selected (Fig.AT-3.4).

7. *Click* the **Properties** icon Fig.AT-3.4.



Fig.AT-3.3



Fig.AT-3.4

A **User Properties** dialog box appears (Fig.AT-3.5).

8. *Select* the old password in the **Password** textbox (Fig.AT-3.5).
9. *Type* the new password in the **Password** textbox (Fig.AT-3.6).
10. *Select* the old password in the **Confirm Password** textbox (Fig.AT-3.6).



Fig.AT-3.5



Fig.AT-3.6

11. *Type* the new password in the **Confirm Password** textbox (Fig.AT-3.7).
12. *Click* the **OK** button (Fig.AT-3.7).
    A confirmation dialog box appears (Fig.AT-3.8).
13. *Click* the **Yes** button (Fig.AT-3.8).



Fig.AT-3.7

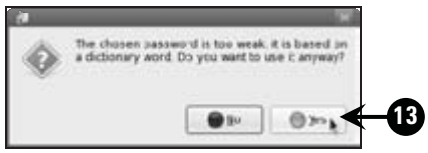


Fig.AT-3.8

The password is changed.

14. *Click* the **Close** icon to close the **User Manager** window, as shown in Fig.AT-3.9:



Fig.AT-3.9

Let's now learn how to change the root user's password.

Changing Root User's Password

Root user can be referred to as system administrator, who has access to every data and permission on a system. If you are a root user, you can even have access to all the configuration and settings that are made by the general users. A password can also be changed for the root user. It is important to change the password on a regular basis to ensure security of the data on your system.

Perform the following steps to change the password for the root user:

1. *Click* the **Applications** menu from the Menu bar. A drop-down menu appears (Fig.AT-3.10).
2. *Select* the **System Tools** option. A sub-menu appears (Fig.AT-3.10).
3. *Click* the **Terminal** option, as shown in Fig.AT-3.10:

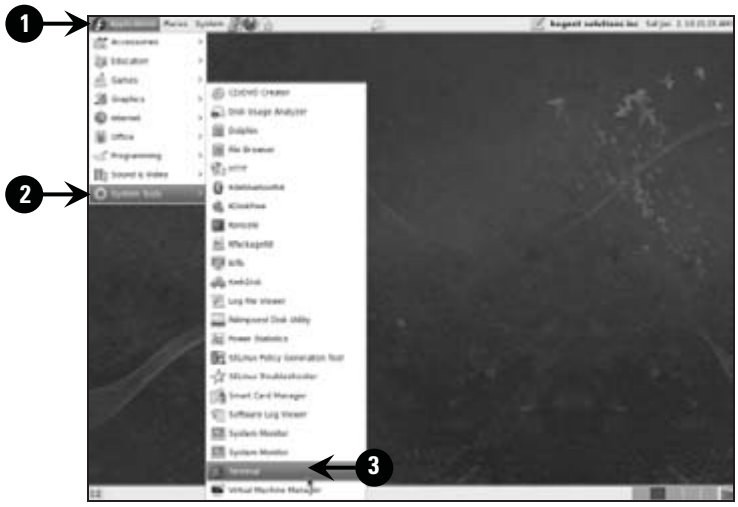


Fig.AT-3.10

A Terminal window appears (Fig.AT-3.11).

4. *Type* the **su** command to switch to root user (Fig.AT-3.11).

5. *Press* the **ENTER** key.
6. *Type* the current root password besides the **password** option (Fig.AT-3.12).

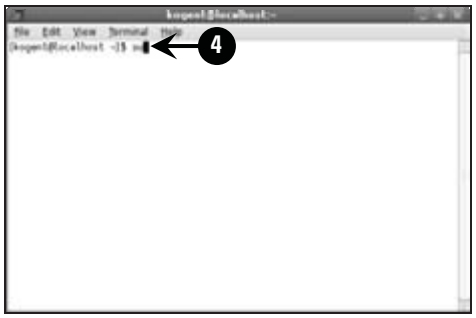


Fig.AT-3.11

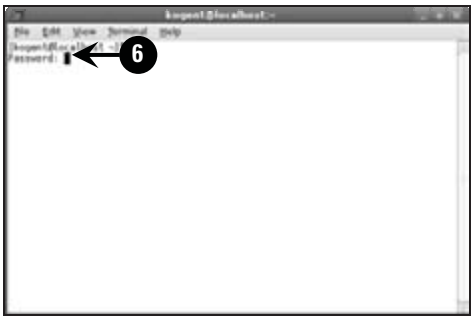


Fig.AT-3.12

7. *Press* the **ENTER** key.
8. *Type* the **passwd** command (Fig.AT-3.13).
9. *Press* the **ENTER** key.
10. *Type* the new root password besides the **New password** option (Fig.AT-3.14).

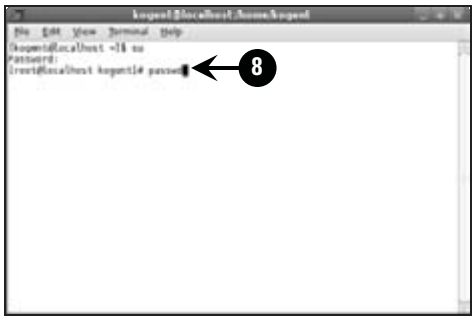


Fig.AT-3.13

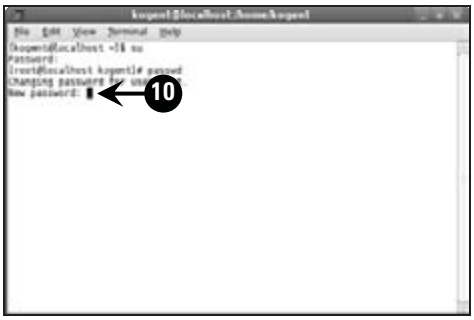


Fig.AT-3.14

11. *Press* the **ENTER** key.
12. *Re-type* the new root password besides the **Retype new password** option (Fig.AT-3.15).
13. *Press* the **ENTER** key.

    The password gets changed (Fig.AT-3.16).

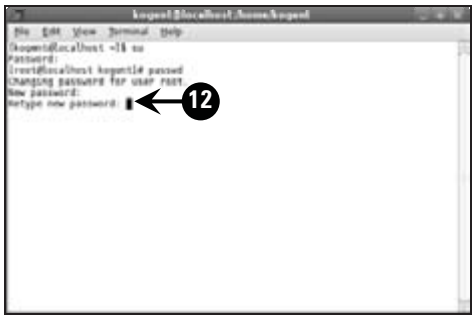


Fig.AT-3.15



Fig.AT-3.16

14. *Click* the **File** menu from the Menu bar. A drop-down menu appears (Fig.AT-3.17).
15. *Click* the **Close Window** option (Fig.AT-3.17).

A confirmation dialog box appears (Fig.AT-3.18).

16. *Click* the **Close Terminal** button (Fig.AT-3.18).



Fig.AT-3.17



Fig.AT-3.18

The terminal window is closed.

Let's now discuss monitoring log files.

Monitoring Log Files

Log files are the files that consist of the messages about the kernel and the applications that are running on your system. These files are available in the **/var/log** directory of your Linux system. You can view the log files present on the system with the Log File Viewer utility. Log File Viewer is a GUI application, which is used to view and monitor the system log files.

Perform the following steps to start the Log File Viewer application:

1. *Click* the **Applications** menu from the Menu bar. A drop-down menu appears (Fig.AT-3.19).
2. *Select* the **System Tools** option. A sub-menu appears (Fig.AT-3.19).
3. *Click* the **Log File Viewer** option (Fig.AT-3.19).

   A **Query** dialog box appears (Fig.AT-3.20).
4. *Type* the root password in the **Password** textbox (Fig.AT-3.20).
5. *Click* the **OK** button (Fig.AT-3.20).

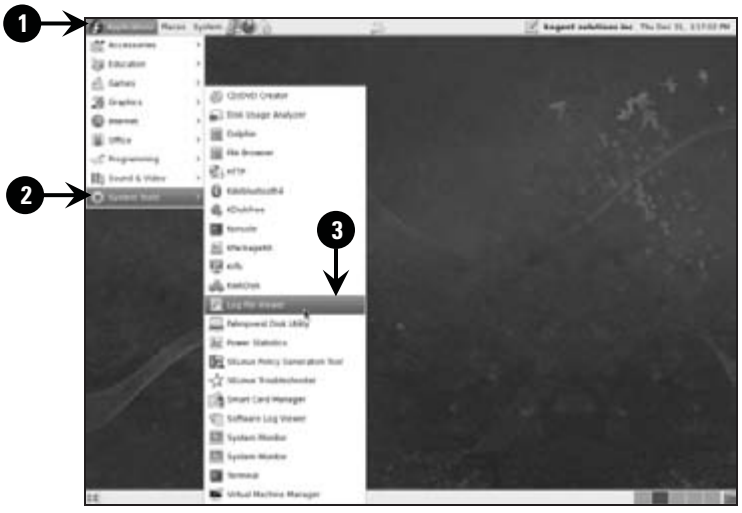


Fig.AT-3.19

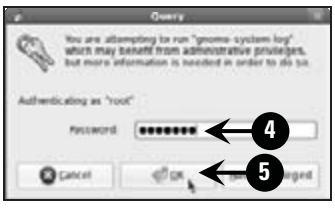


Fig.AT-3.20



You can also open System Log Viewer application from the terminal window by typing the gnome-system-log command.

A **System Log Viewer** window appears. The **messages** log file is selected, by default. Therefore, the name of the application window appears as **messages – System Log Viewer** (Fig.AT-3.21).

6. *Click* the **Cron** log file to view its content (Fig.AT-3.21).
   The **cron** log file content is displayed (Fig.AT-3.22).

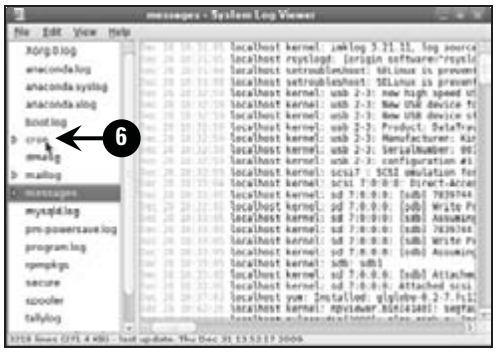


Fig.AT-3.21

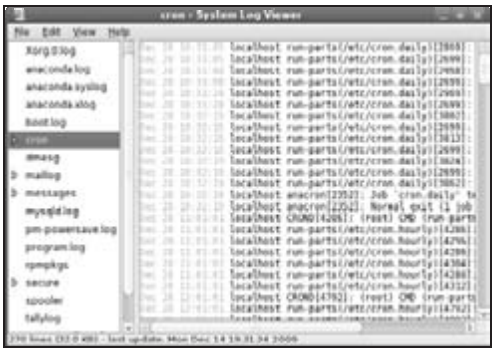


Fig.AT-3.22

The following is the brief description of some of the commonly found log files:

- **Xorg.0.log:** Consists of messages that are the result of the X.Org X server
- **boot.log:** Lists the messages indicating whether the system services starts and shuts successfully or not
- **cron:** Lists the crond daemon status messages that includes the backup and log files rotation
- **dmesg:** Consists the recording of the messages that are printed during the booting of system by the kernel
- **maillog:** Consists the address information to and from which e-mail messages are sent and received
- **messages:** Refer to a log file used for general purposes, such as viewing the messages record by the program
- **mysqld.log:** Consists of messages related to the MySQL database server
- **rpmpkgs:** Consists of a list of Red Hat Package Manager (RPM) packages
- **secure:** Lets you track the date, time, and duration of the login attempts
- **spooler:** Lists the messages sent by Usenet News server, if it is present

The syslogd service is used to manage the files present in the /var/log directory. Most of the programs write their log files, and the messages are sent to the syslogd service. This service can either record all or none of the messages sent by the log files. The messages sent by the other systems that are on network can also be accepted by the syslogd service and lets you centralize the managing of all the messages.

Understanding Secure Shell Tools in Fedora

Secure Shell (SSH) is an application, used to connect remote systems in the network. It works as TCP/IP service and secures the information exchanged over the network. The Secure Shell (SSH) tools include client and server applications that are used to perform interaction services, such as remote login. These are more secure than earlier UNIX tools, such as rsh and rcp. The SSH are easy to start. You can start SSH by simply starting the sshd service.

Let's learn to use the chkconfig command and the commands used with ssh in the following sections.

Using the chkconfig Command to Start the SSH Service

In Fedora Linux, you can check the status of the ssh service and start it from the terminal window.

Perform the following steps to start the SSH service on your system:

1. *Click* the **Applications** menu from the Menu bar. A drop-down menu appears (Fig.AT-3.23).
2. *Click* the **System Tools** option. A sub-menu appears (Fig.AT-3.23).

3. *Select* the **Terminal** option, as shown in Fig.AT-3.23:

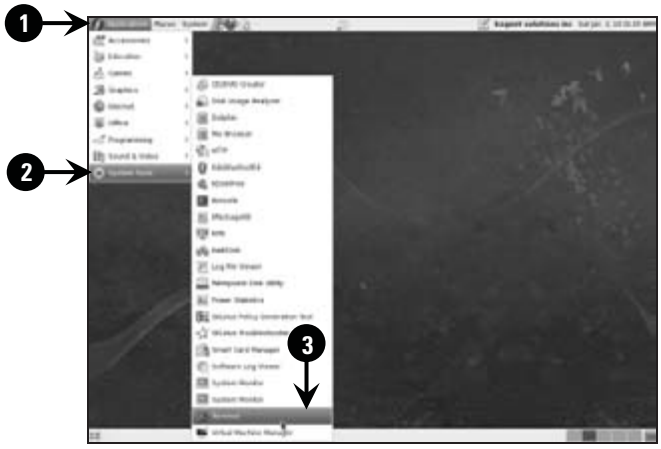


Fig.AT-3.23

A Terminal window appears (Fig.AT-3.24).

4. *Type* the **su** command to switch to the root user (Fig.AT-3.24).
5. *Press* the **ENTER** key.
6. *Type* the root password besides the **password** option (Fig.AT-3.25).

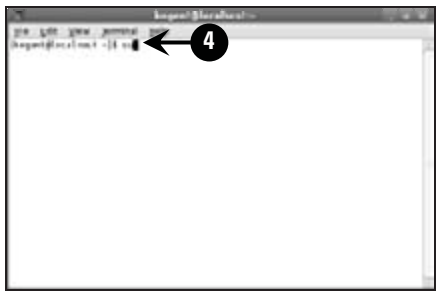


Fig.AT-3.24

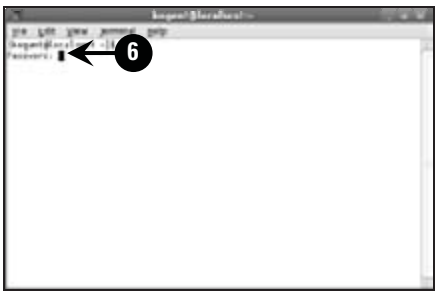


Fig.AT-3.25

7. *Press* the **ENTER** key.
8. *Type* the **chkconfig --list sshd** command (Fig.AT-3.26).

   A list showing the status of the sshd service is displayed. The service is started only in default bootup states, which are 2, 3, 4, and 5 (Fig.AT-3.27).
9. *Type* the **chkconfig sshd on** command to start the SSH service on your default system, which is 0 (Fig.AT-3.27).

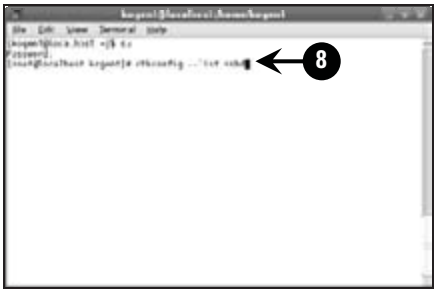


Fig.AT-3.26

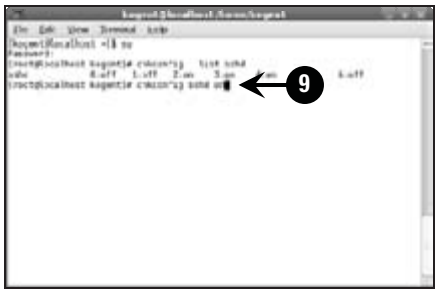


Fig.AT-3.27

The SSH service starts after you run the 2, 3, 4, and 5 level.

10. *Type* the **service sshd start** command to start the SSH service immediately, as shown in Fig.AT-3.28:

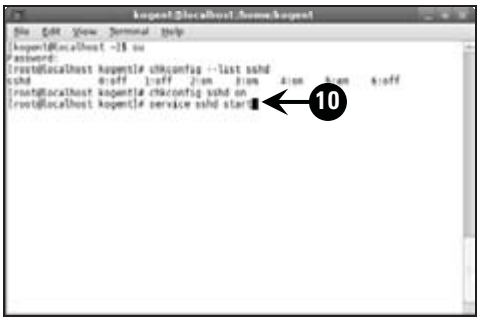


Fig.AT-3.28

11. *Press* the **ENTER** key.

The SSH service starts.

Let's now learn about the ssh, sftp, and scp commands.

Exploring the ssh, sftp, and scp Commands

As it is stated in the preceding section that the SSH service is used for interaction between systems on the network. There are three commands that are used with the SSH service to establish the interaction, namely, the ssh, sftp, and scp commands. The **ssh** command is used to login or execute a command on your system by the remote user in a secure manner. The **sftp** command using the SSH service lets you access the FTP sites, and the **scp** command lets the other users to copy their files to and from your system.

The connection to remote users is allowed after checking the **/etc/hosts.equiv** file and user's **.rhost** file. The **/etc/shosts.equiv** and **.shosts** files are also preferred. However, all these files are functionally equivalent.

Exploring Security Enhanced Linux (SELinux)

SELinux is used to secure server by controlling access of the security policies. It is an open-source project developed by National Security Agency (NSA). The basic goal of NSA behind developing SELinux was to develop secure Linux systems. The SELinux comes as an add-on with some of the Linux distribution packages, such as Ubuntu, but in Fedora and Red Hat Enterprise, it is installed, by default.

SELinux is used to protect the services as soon as firewall port gets started that results in disabling the access to the resources, such as configuration file. There are many useful features of SELinux, such as controlling the process initialization, files, directories, sockets, or network interfaces. You can also modify and change the policies with SELinux. It does not depend on a specific policy language or a label format.

Summary

The chapter introduced you with security checklist in Linux. Next, you explored password protection that includes changing password for the general user as well as the root user. You also learned how to monitor the log files. Next, you explored SSH tools and the commands, such as ssh, sftp, and scp. In the end, you also discussed SELinux.

APPENDIX



Virtualization in Linux

In this Chapter:

- Describing Virtualization in Linux Fedora
- Creating a Virtual Machine
- Accessing a Virtual Machine

Linux provides the virtualization method that allows you to run several operating systems in your system. The running operating systems work isolated to each other. Virtualization saves cost by reducing the hardware requirement by running the multiple operating systems in a single system. Virtualization is also beneficial for product testing. It helps in testing the product by means of setup and maintains the testing environment easily and quickly. Virtualization makes the process of deploying applications easy as it reduces the hardware compatibility in applications deployment. Virtualization is now available with all the Linux distributions. To enable virtualization in your system, you need to install virtual machine in your system.

In this appendix, first you explore virtualization in Linux Fedora, and then you learn how to create and access virtual machine.

Describing Virtualization in Linux Fedora

Fedora 11 provides the Virtual Machine Manager tool for virtualization. The Virtual Machine Manager tool provides a graphical interface to administer virtual machines. Fedora 11 provides the new enhancements in virtualization in the area of management, performance, and security. It provides the new features, such as the new Virtual Machine creation wizard, interface for assigning the physical devices to existing virtual machines, and an improved Virtual Network Computing (VNC) authentication that allows clients to securely connect to remote virtual machines. You can install Virtual Machine Manager if it is not already installed in your machine. Let's now learn to install Virtual Machine Manager in your system.

Perform the following steps to install Virtual Machine Manager:

1. *Select* **System→Administration→Add/Remove Software**, as shown in Fig.AP-1:

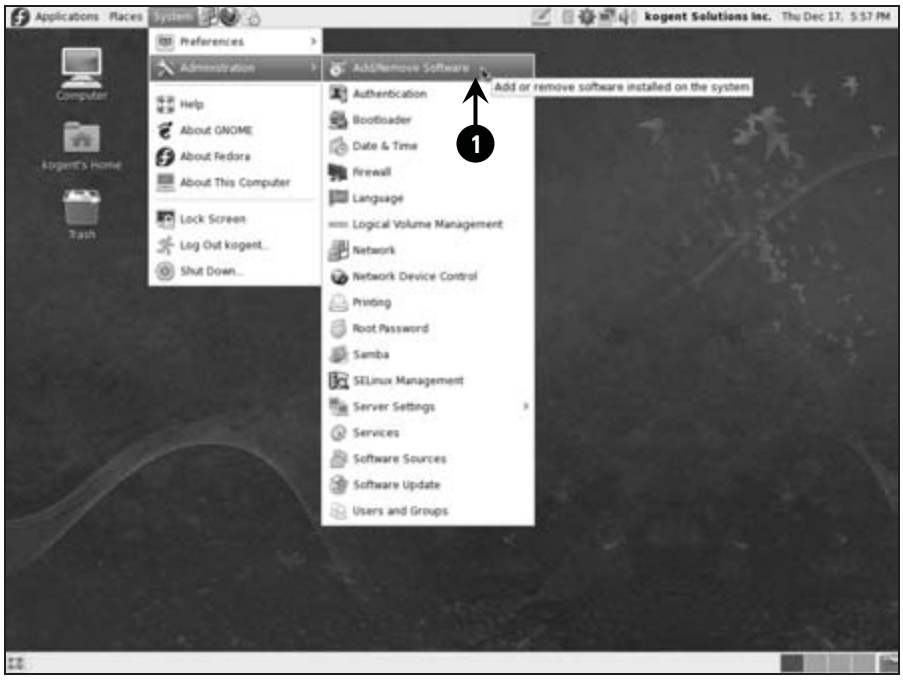


Fig.AP-1

The **Add/Remove Software** window appears (Fig.AP-2).

2. *Type* Virtual **Machine Manager** in the text box beside the **Find** button (Fig.AP-2).
3. *Click* the **Find** button, as shown in Fig.AP-2:



Fig.AP-2

A list of installed and uninstalled software packages that matches with your search appears.



You can view from the right pane that check boxes beside the installed programs are selected; whereas, the check boxes beside the uninstalled programs are cleared.

4. *Select* the **Virtual Machine Manager** check box from the right pane (Fig.AP-3).
5. *Click* the **Apply** button, as shown in Fig.AP-3:



Fig.AP-3



After a few seconds, a message box appears to inform that there are other packages related to the Virtual Machine Manager that is to be installed in that message box we can click the Install or Cancel button.

The Add/Remove Software utility downloads additional packages necessary for Virtual Machine Manager and installs Virtual Machine Manager automatically (Fig.AP-3). Fig.AP-4 shows the downloading process of Virtual Machine Manager:



Fig.AP-4

When Virtual Machine Manager is installed in your system, a message box appears that shows the path to access Virtual Machine Manager from the panel menubar (Fig.AP-5).

6. You can directly run the Virtual Machine Manager tool by clicking the **Run** button from the message box or close it by clicking the **Close** button. In our case, we click the **Close** button, as shown in Fig.AP-5:



Fig.AP-5

7. *Click* the **Close** button available on the Title bar of the Add/Remove Software window to close it, as shown in Fig.AP-6:



Fig.AP-6

After installing Virtual Machine Manager in your system, you can open it to work with it. Perform the following steps to launch Virtual Machine Manager:

8. *Select* **Applications→System Tools→Virtual Machine Manager**, as shown in Fig.AP-7:

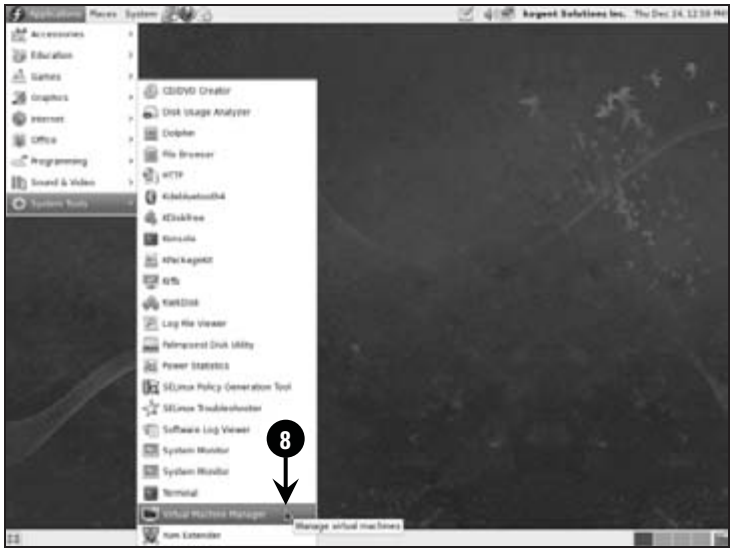


Fig.AP-7

A message box appears that ask you to enter the root password.

9. *Enter* the root password in the Password for root text box and *Press* he **OK** button in message box. The **Virtual Machine Manager** window appears, as shown in Fig.AP-8:

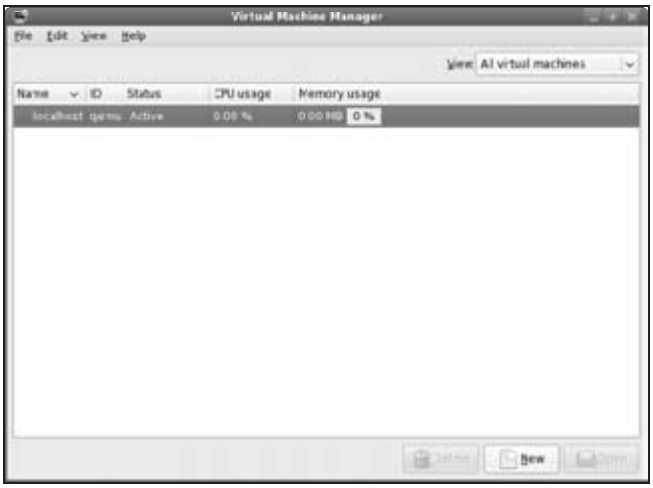


Fig.AP-8



If the hypervisor, such as qemu is not installed in your system, then you need to install it to your system run Virtual Machine Manager.

Virtual Machine Manager has been launched in your system. Let's now learn how to create a virtual machine using Virtual Machine Manager.

Creating a Virtual Machine

After installing Virtual Machine Manager, you can create a virtual machine to run one or more guest operating systems in your system. These guest operating systems work independently to each other and the host operating system.

Let's perform the following steps to create a virtual machine:

1. *Click* the **New** button available on the bottom of the **Virtual Machine Manager** window, as shown in Fig.AP-9:

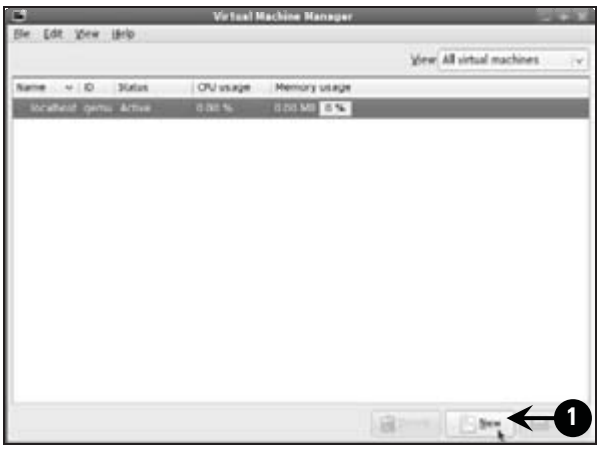


Fig.AP-9

The **New VM** wizard appears (Fig.AP-10).

2. *Type* the name of virtual machine that you want to create in the **Name** text box. In our case, we have typed Windows (Fig.AP-10).
3. *Select* a radio button under the **Choose how would you like to install the operating system** category to select a method of installation of the operating system. In our case, we have selected **Local install media (ISO image or CDROM)** (Fig.AP-10).
4. *Click* the **Forward** button, as shown in Fig.AP-10:



Fig.AP-10

The Step 2 of 5 page of the New VM wizard appears (Fig.AP-11). You need to insert a CD/ DVD of a guest operating system for installation in the CD/DVD ROM.

5. *Select* a radio button under the **Locate your install media** category to locate the media of installation. In our case we have selected **Use CDROM or DVD** (Fig.AP-11).
6. *Select* a type of operating system that you want to install in the virtual machine from the **OS Type** drop-down list. In our case, we have selected **Windows** (Fig.AP-11).

7. *Select* a version of operating system from the Version list box. In our case, we have selected **Microsoft Windows Vista** (Fig.AP-12).
8. *Click* the **Forward** button (Fig.AP-12).

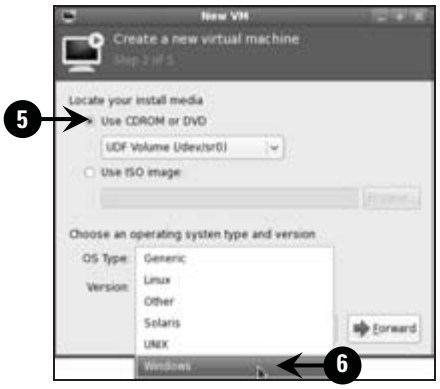


Fig.AP-11

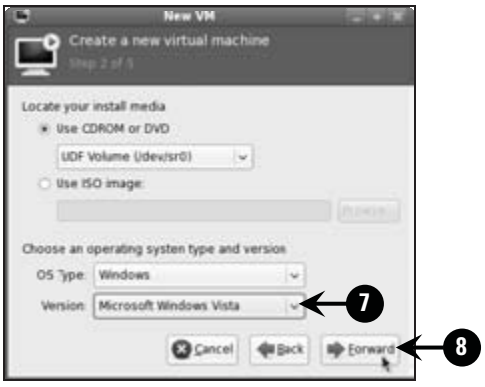


Fig.AP-12

The Step 3of 5 page of the New VM wizard appears (Fig.AP-13).

9. *Type* the memory size to set the memory for virtual machine in the **Memory (RAM)** spin box. In our case, we have typed **512** MB (Fig.AP-13).
10. *Set* the number of CPUs you want to allocate to virtual machine from the **CPUs** spin box. In our case, we have set **1** (Fig.AP-13).
11. *Click* the **Forward** button (Fig.AP-13).

The Step 4 of 5 page of the New VM wizard appears (Fig.AP-14).

12. *Select* the **Enable storage for this virtual machine** check box to enable the options to allocate storage to the virtual machine (Fig.AP-14).
13. *Select* the **Create a disk image on the computer's hard drive** radio button to create a disk image on the hard disk of a computer (Fig.AP-14).
14. *Click* up or down arrow in the list box to set amount of storage (in GB) you want to allocate to the virtual machine. In our case, we allocate **25 GB** to install Windows VISTA (Fig.AP-14).
15. *Select* the **Allocate entire disc now** check box to allocate the entire available storage for the virtual machine (Fig.AP-14).
16. *Click* the **Forward** button (Fig.AP-14).

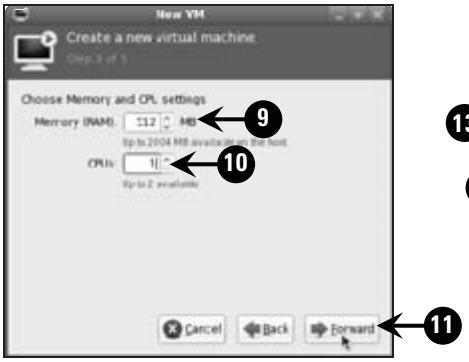


Fig.AP-13



Fig.AP-14

17. *Click* the **Finish** button in the wizard (Fig.AP-15).

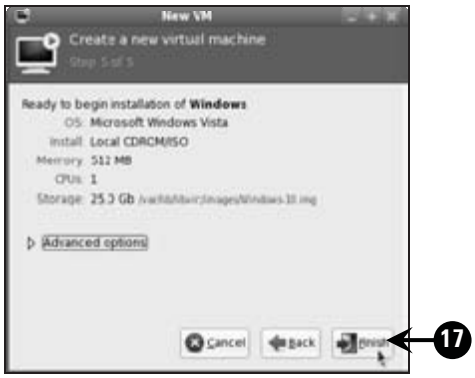


Fig.AP-15

The virtual machine is created. The new virtual machine that you create (named as Windows) is displayed in the Virtual Machine Manager window, as shown in Fig.AP-16:

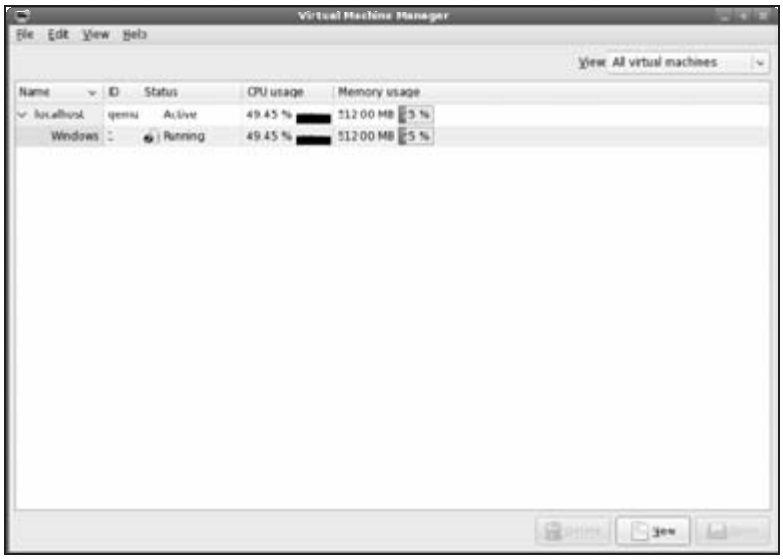


Fig.AP-16

After learning to create a virtual machine, let's now learn how to access a virtual machine.

Accessing a Virtual Machine

When, you have finished creating a virtual machine, the new created machine that is Windows Virtual Machine automatically opens. The Windows Virtual Machine window contains two tabs: Details and Console. The Details tab allows you to assign the hardware to the virtual machine. By default, the Console tab is opened. Under this tab, you can access a guest operating system. To work on the guest operating system, you first need to install it.

Let’s perform the following steps to install the guest operating system:

1. *Select* the language to install Windows Vista from the **Language to install** list box. Then, *select* time and currency format from the **Time and currency format** list box and input method from the **Keyboard or input method** list box (Fig.AP-17).
2. *Click* the **Next** button, as shown in Fig.AP-17:



Fig.AP-17

3. *Click* the **Install now** button, as shown in Fig.AP-18:



Fig.AP-18

The **Please wait** message appears in the Windows Virtual Machine window, as shown in Fig.AP-19:

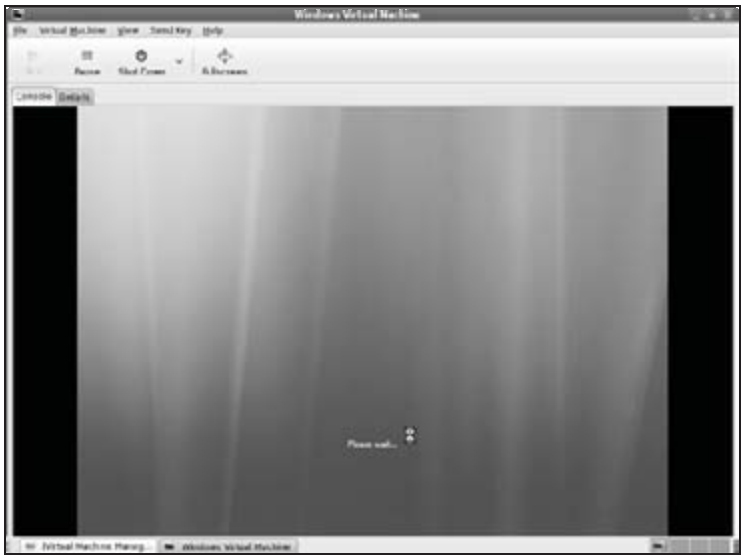


Fig.AP-19

You have to wait for some time. Once the installation process ends, you can work on the guest operating system. You can change the hardware configuration assigned to the virtual machine by selecting the Details tab from the Windows Virtual Machine window.

4. *Select* the **Details** tab (Fig.AP-20).
5. *Select* the **Processor** option under the **Details** tab from the left pane of the Windows Virtual Machine window (Fig.AP-20).
6. *Set* the number of the virtual CPUs allocated to the virtual machine in the **Change allocation** spin box, as shown in Fig.AP-20:

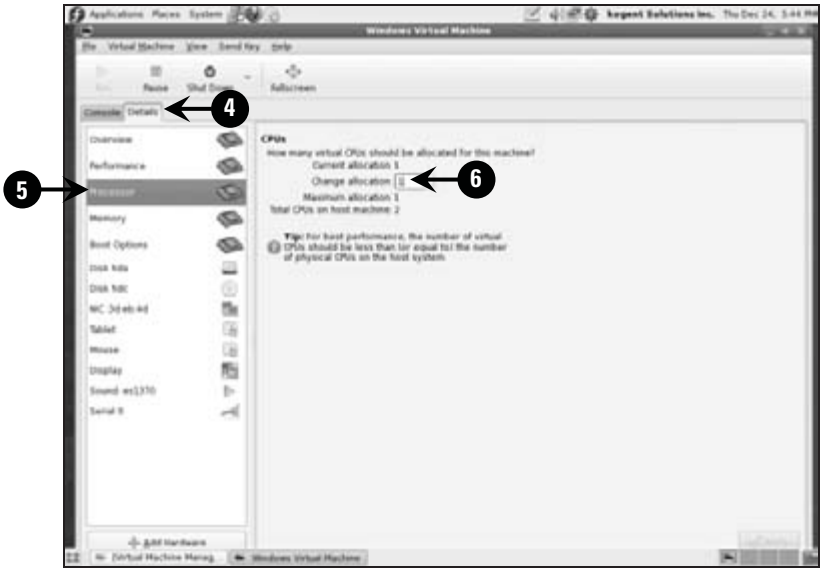


Fig.AP-20



The total CPUs on a host system are displayed in the right pane of the Windows Virtual Machine window. In our case, it is 2. You cannot allocate more number of CPUs than the total available on the host system. When you change the number of CPUs allocated to the virtual machine, the Apply button on the bottom-right corner of the Windows Virtual Machine gets enabled.

7. *Select* the **Memory** option from the left pane of the **Windows Virtual Machine** window. The right pane shows the Memory details, such as current memory allocated to the virtual machine, and total memory on the host system (Fig.AP-21).
8. *Set* the memory you want to allocate to the virtual machine in the **Change allocation** spin box (Fig.AP-21).
9. *Set* the maximum memory you want to allocate to the virtual machine in the **Maximum allocation** spin box. In our case, we have set **1024** (Fig.AP-21).
10. *Click* the **Apply** button, as shown in Fig.AP-21:

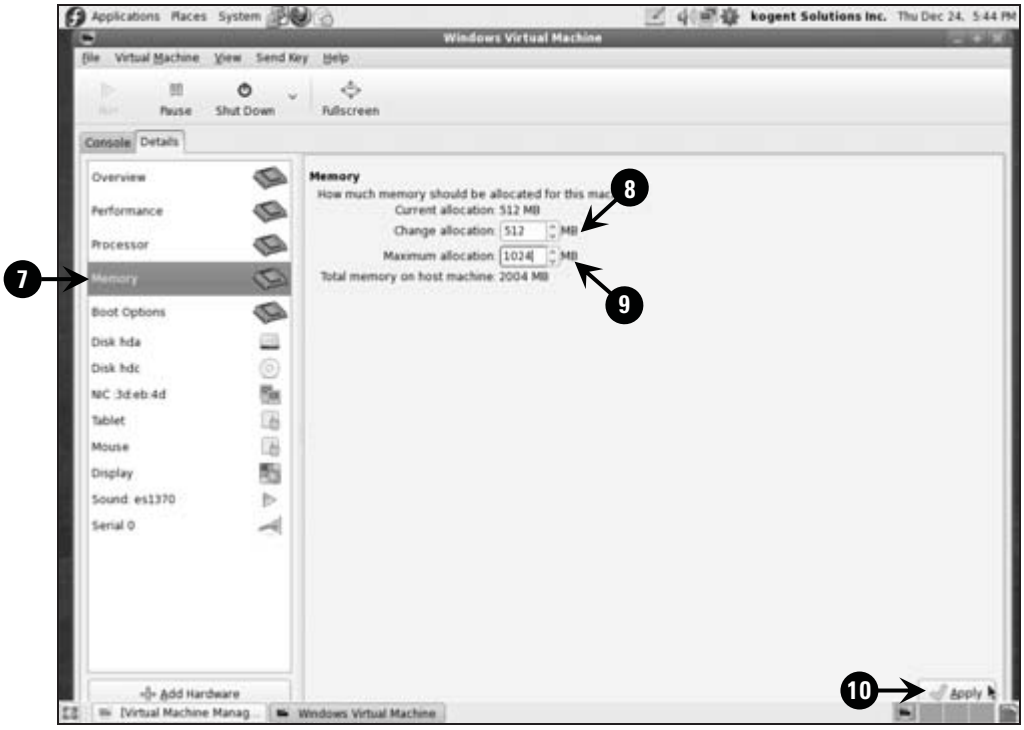


Fig.AP-21

11. *Select* the **Boot Options** from the left pane of Windows Virtual Machine (Fig.AP-22).
    The right pane displays the details for booting (Fig.AP-22).
12. *Click* the down arrow button of the **Boot Device** list box, as shown in Fig.AP-22:

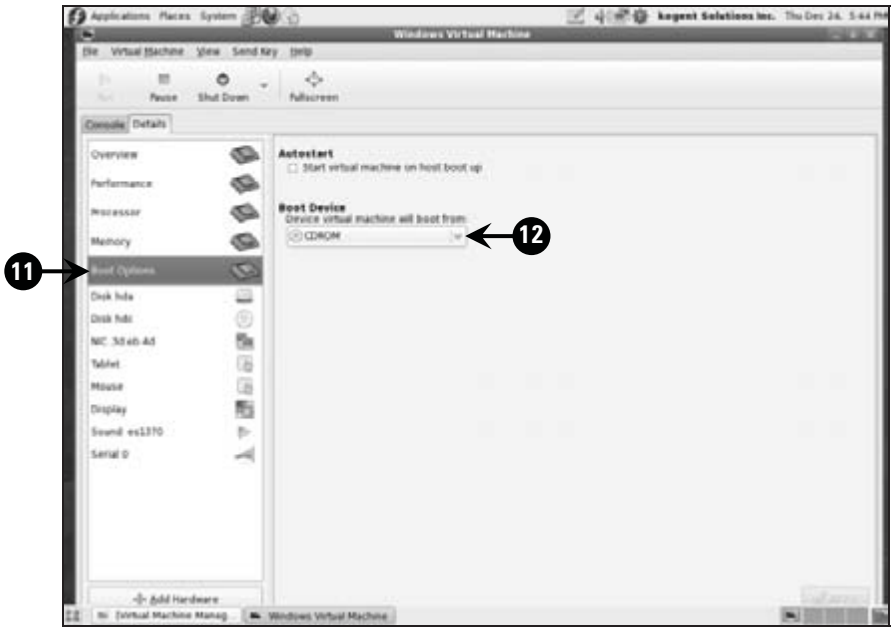


Fig.AP-22

A list of booting devices appears (Fig.AP-23).

13. *Select* a booting device from the drop-down list. In our case, we have selected **CDROM** (Fig.AP-23).
14. *Click* the **Close** button available on the Title bar of the window to close it, as shown in Fig.AP-23:

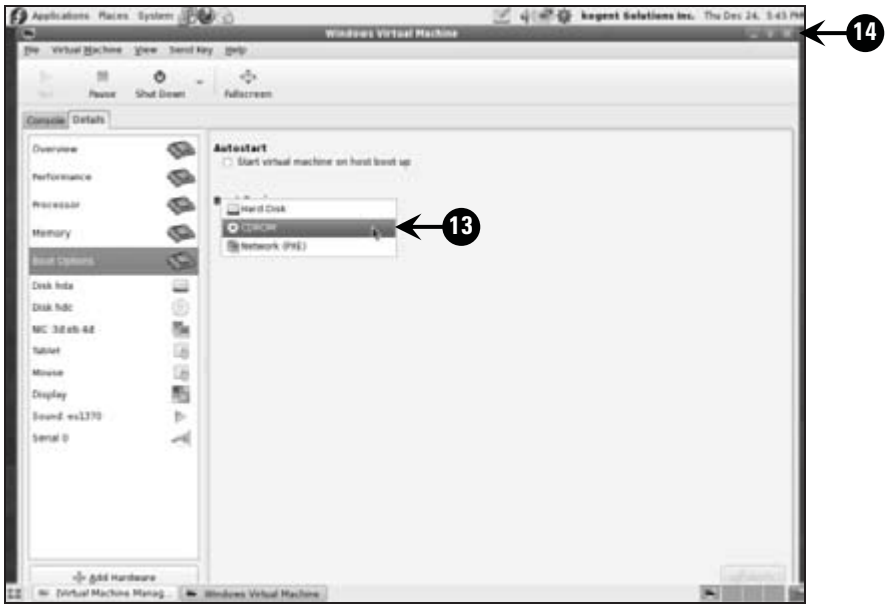


Fig.AP-23

Now, you have learned to access a guest operating system in Linux Fedora.