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Instructor Resources and Course Presenter for

Discovering COMPUTERS

COMPLETE

Your Interactive Guide to the Digital World

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Instructor Resources

Included on each disc
When you launch the enclosed disc you'll have access to the following:

- Instructor's Manual
- Syllabus
- Figures from the text
- Solutions to exercises
- Test Bank and Test Engine
- PowerPoint Presentations – Course Presenter

You can also access these files and the latest information on **login.cengage.com**

Course Presenter

The Course Presenter is an interactive, multimedia one-click-per-slide presentation system that provides PowerPoint slides for every topic in each chapter. This presentation system enables engaging, well organized, and knowledge-based lectures that keep students interested and lend to retention of material covered. Presentations include the following features:

- PowerPoint-style outline of the chapter content with accompanying figures
- Page number references indicating where slide content is discussed in the textbook
- Timed elements and animations to help maintain student interest
- Videos that are relevant to every-day experience and relate to the slide content, which can be used optionally to enhance a presentation

Installation Instructions:

1. Insert disc into the CD-ROM drive.
2. If disc interface does not auto launch:
   - Click Start.
   - Click Run.
   - Type D:\CT_Resources.exe (where "D"is your CD-ROM drive).
   - Click OK.
3. Follow on-screen instructions.

System Requirements:

- PC with 300 megahertz (MHz) or higher processor clock speed recommended
- 128 megabytes (MB) of RAM or higher
- Super VGA (800 x 600) or higher resolution video adapter and monitor
- DVD drive
- One of the following operating systems must be installed:

  Microsoft Window® XP
  Microsoft Windows® Vista™
  Microsoft Windows® 7

Discovering COMPUTERS

Your Interactive Guide to the Digital World

COMPLETE

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Shelly Cashman Series®
A part of Course Technology, Cengage Learning

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COURSE TECHNOLOGY
CENGAGE Learning™

Discovering Computers: Your Interactive Guide to the Digital World, Complete
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Misty E. Vermaat

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Discovering Computers Complete

Your Interactive Guide to the Digital World

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Discovering Computers Complete

Your Interactive Guide to the Digital World

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? FAQs

! INNOVATIVE COMPUTING

LOOKING AHEAD

Preface

The Shelly Cashman Series® offers the finest textbooks in computer education. We are proud of the fact that the previous sixteen editions of this textbook have been the most widely used in computer education. With this edition of *Discovering Computers,* we have implemented significant improvements based on current computer trends and comments made by instructors and students, and are introducing an interactive, multi-media e-book and CourseMate Web site. *Discovering Computers: Your Interactive Guide to the Digital World* continues with the innovation, quality, and reliability you have come to expect from the Shelly Cashman Series.

In *Discovering Computers: Your Interactive Guide to the Digital World,* you will find an educationally sound, highly visual, interactive, and easy-to-follow pedagogy that, with the help of animated figures, relevant video, and interactive activities in the e-book, presents an in-depth treatment of introductory computer subjects. Students will finish the course with a solid understanding of computers, how to use computers, and how to access information on the Web.

Objectives of this Text, e-Book, and CourseMate Web Site

Discovering Computers: Your Interactive Guide to the Digital World, Complete is intended for use as a stand-alone solution or in combination with an applications, Internet, or programming textbook in a full-semester introductory computer course. No experience with computers is assumed. The objectives of this offering are to:

- Present the most-up-to-date technology in an ever-changing discipline
- Give students an in-depth understanding of why computers are essential components in business and society
- Teach the fundamentals of computers and computer nomenclature, particularly with respect to personal computer hardware and software, and the Web
- Present the material in a visually appealing, interactive, and exciting manner that motivates students to learn
- Assist students in planning a career
- Provide exercises, lab assignments, and interactive learning activities that allow students to learn by actually using the computer and the Web

Hallmarks of Discovering Computers

To date, more than six million students have learned about computers using *Discovering Computers*. With the Web integration and interactivity, streaming up-to-date audio and video, extraordinary step-by-step visual drawings and photographs, unparalleled currency, and the Shelly and Cashman touch, this book will make your computer concepts course exciting and dynamic. Hallmarks of Shelly Cashman Series *Discovering Computers* include:

A Proven Pedagogy

Careful explanations of complex concepts, educationally-sound elements, and reinforcement highlight this proven method of presentation.

A Visually Appealing Book that Maintains Student Interest

The latest technology, pictures, drawings, and text are combined artfully to produce a visually appealing and easy-to-understand book. Many of the figures include a step-by-step presentation (see page 145), which simplifies the more complex computer concepts. Pictures and drawings reflect the latest trends in computer technology. This combination of pictures, step-by-step drawings, and easy-to-read text layout sets the standard for computer textbook design.

- Present strategies for purchasing a desktop computer, a notebook computer, a Tablet PC, and personal mobile devices
- Provide alternative learning techniques and reinforcement via the Web
- Offer distance-education providers a textbook with a meaningful and exercise-rich digital learning experience

Distinguishing Features

Discovering Computers: Your Interactive Guide to the Digital World includes a variety of compelling features, certain to engage and challenge students, making learning with *Discovering Computers* an enriched experience. These compelling features include:

- Multi-media rich and interactive e-book and CourseMate Web site that engage students in learning about computer concepts.
- Animations, relevant and timely video, interactive in-chapter activities and Quiz Yourself reinforcement exercises embedded in the e-book, combined with the integration of interactive activities, videos, and end-of-chapter student assignments on the CourseMate Web site offer students an exceptional learning solution.
- Living Digitally and Web 2.0 features introduce and familiarize students with new and developing technology, making the technology accessible for introductory students.
- Innovative Computing, FAQ and Ethics & Issues boxes, Companies on the Cutting Edge, Technology Trailblazers, and High-Tech Talk articles enable relevant classroom discussion.

Latest Technologies and Terms

The technologies and terms your students see in *Discovering Computers* are those they will encounter when they start using computers. Only the latest application software is shown throughout the book.

Web Integrated

This book uses the Web as a major learning tool. The purpose of integrating the Web into the book is to (1) offer students additional information and currency on important topics; (2) use its interactive capabilities to offer creative reinforcement and online quizzes; (3) make available alternative learning techniques with Web-based learning games, practice tests, and interactive labs; (4) underscore the relevance of the Web as a basic information tool that can be used in all facets of society; (5) introduce students to doing research on the Web; and (6) offer instructors the opportunity to organize and administer their traditional campus-based or distance-education-based courses on the Web using various learning management systems.

Extensive End-of-Chapter Student Assignments

A notable strength of *Discovering Computers* is the extensive student assignments and activities at the end of each chapter. Well-structured student assignments can make the difference between students merely participating in a class and students retaining the information they learn. The student assignments in *Discovering Computers: Your Interactive Guide to the Digital World* include: Chapter Review, Key Terms, Checkpoint, Problem Solving @ Home, Problem Solving @ Work, Learn It Online, Learn How To, Web Research, and Critical Thinking. The Problem Solving and Critical Thinking student assignments also include Collaboration exercises, encouraging team work amongst students.

Instructor Resources

The Instructor Resources include both teaching and testing aids.

Instructor's Manual Includes lecture notes summarizing the chapter sections, figures and boxed elements found in every chapter, teacher tips, classroom activities, lab activities, and quick quizzes in Microsoft Word files.

Syllabus Easily customizable sample syllabi that cover policies, assignments, exams, and other course information.

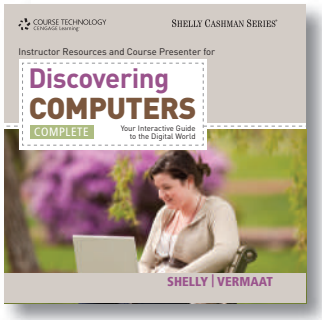

Figure Files Illustrations for every figure in the textbook in electronic form. Figures are provided both with and without callouts.

Solutions to Exercises Includes solutions for all end-of-chapter student assignments. Also includes Tip Sheets, which are suggested starting points for the Problem Solving exercises.

PowerPoint Presentations — Course Presenter A one-click-per-slide presentation system that provides PowerPoint slides for every subject in each chapter. Several computer-related video clips are available for optional presentation. Course Presenter provides consistent coverage for multiple lecturers.

Test Bank & Test Engine Test Banks include 220 questions for every chapter, featuring objective-based and critical thinking question types, and including page number references and figure references, when appropriate. Also included is the test engine, ExamView, the ultimate tool for your objective-based testing needs.

Printed Test Bank A Rich Text Format (.rtf) version of the test bank that you can print.

Test Out/Final Exam Objective-based exam that can be used to test students out of your course, or as a final examination. Includes a master answer sheet.

Pretest/Posttest Carefully prepared tests that can be used at the beginning and the end of the semester to measure student progress. Includes master answer sheet.

NEW! Computer Concepts CourseMate

The new Computer Concepts CourseMate for *Discovering Computers* is the most expansive digital site for any computer concepts text in the market today! The content in the CourseMate solution is integrated into each page of the text, giving students easy access to current information on important topics, reinforcements activities, and alternative learning techniques. Integrating the Computer Concepts CourseMate into the classroom keeps today's students engaged and involved in the learning experience.

The Computer Concepts CourseMate includes an integrated, multi-media rich and interactive digital book, and a variety of interactive Quizzes and Learning Games, Exercises, Web Links, Videos, and other features that specifically reinforce and build on the concepts presented in the chapter. These interactive activities are tracked within the CourseMate EngagementTracker, making it easy to assess students' retention of concepts. This digital solution encourages students to take learning into their own hands and explore related content on their own to learn even more about subjects in which they are especially interested.

All of these resources on the Computer Concepts CourseMate for *Discovering Computers* enable students to get more comfortable using technology and help prepare students to use the Internet as a tool to enrich their lives.

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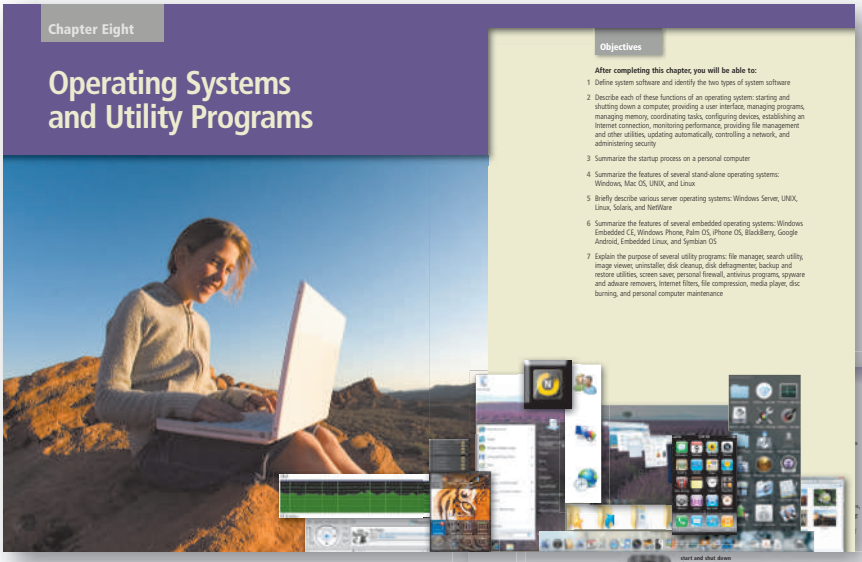
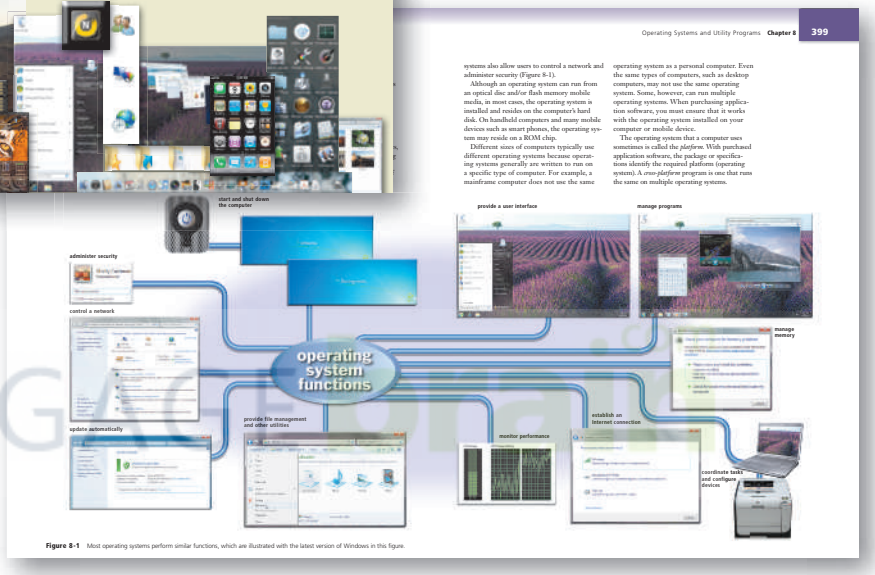
Visual Walkthrough of the Book

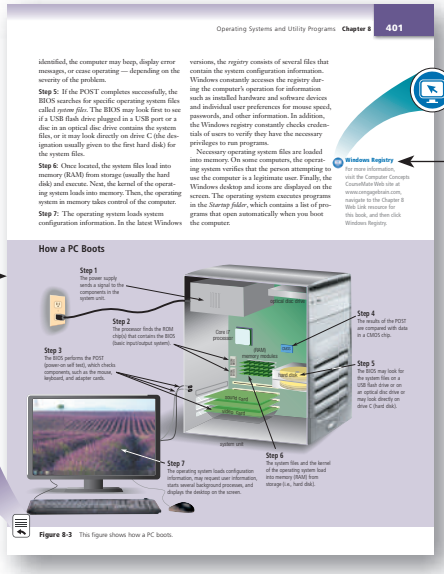
Current. Relevant. Innovative.
Teaching the Significance of Today's Digital World.



Chapter Opener
Before reading the chapter, carefully read through the Objectives to familiarize yourself with the material in each chapter.



Initial Chapter Figure
Carefully study the first figure in each chapter because it provides an easy-to-follow overview of the major purpose of the chapter.



CourseMate Icon
Visit the Computer Concepts CourseMate Web site for access to many of the interactive chapter elements.

Step Figures
Each chapter includes numerous step figures that present the more complex computer concepts using a step-by-step pedagogy.

Web Links
Obtain current information and a different perspective about key terms and concepts by visiting the Web Links found in the margins throughout the book.

Interactive e-Book Activity Icon
Several elements in each chapter are interactive learning activities in the e-book and are identified by this icon.

FAQs

FAQ (frequently asked questions) boxes offer common questions and answers about subjects related to the topic at hand.

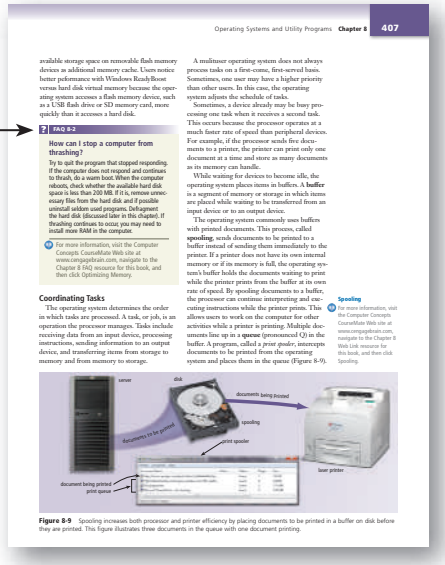
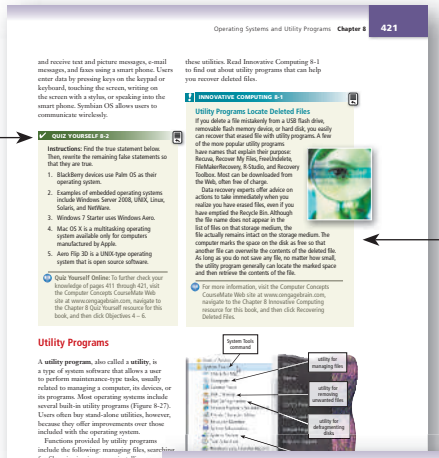


Figure 8-9 Spooling increases both processor and printer efficiency by placing documents to be printed in a buffer on disk before they are printed. This figure illustrates three documents in the queue with one document printing.

Quiz Yourself

Three Quiz Yourself boxes per chapter help ensure retention by reinforcing sections of the chapter material, rather than waiting for the end of chapter to test. Use Appendix A for a quick check of the answers, and access additional Quiz Yourself quizzes via the Computer Concepts CourseMate Web site for interactivity and easy use.



Innovative Computing

Discover different and innovative ways of using various technologies and learn how computing is applied creatively to solve problems.

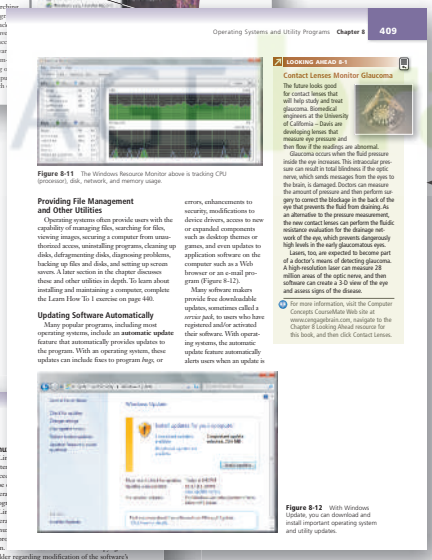


Figure 8-11 The Windows Resource Monitor above is tracking CPU (processor), disk, network, and memory usage.

Figure 8-12 With Windows Update, you can download and install important operating system and utility updates.

Looking Ahead

The Looking Ahead boxes offer a glimpse of the latest advances in computer technology that will be available, usually within five years.

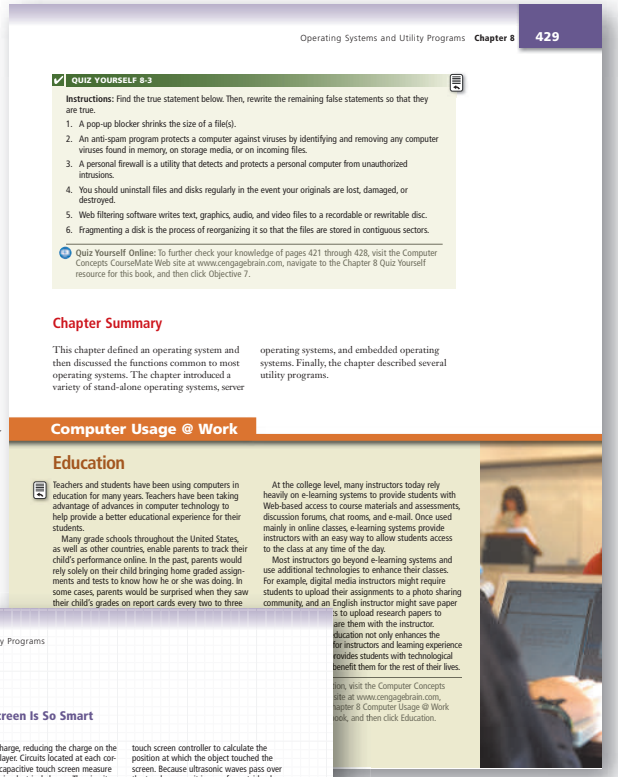
Figure 8-20 Many versions of UNIX have a graphical user interface.

Ethics & Issues

Ethics & Issues boxes raise controversial, computer-related topics of the day, challenging readers to consider closely general concerns of computers in society.

Computer Usage @ Work

Learn about how computers are used in fifteen different professional industries, including transportation, hospitality, education, sports, and construction.



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QUIZ YOURSELF 8-3

Instructions: Find the true statement below. Then, rewrite the remaining false statements so that they are true.

1. A pop-up blocker shrinks the size of a file(s).
2. An anti-spam program protects a computer against viruses by identifying and removing any computer viruses found in memory, on storage media, or on incoming files.
3. A personal firewall is a utility that detects and protects a personal computer from unauthorized intrusions.
4. You should uninstall files and disks regularly in the event your originals are lost, damaged, or destroyed.
5. Web filtering software writes text, graphics, audio, and video files to a recordable or rewritable disc.
6. Fragmenting a disk is the process of reorganizing it so that the files are stored in contiguous sectors.

Quiz Yourself Online: To further check your knowledge of pages 421 through 428, visit the Computer Concepts CourseMate Web site at www.cengagebrain.com, navigate to the Chapter 8 Quiz Yourself resource for this book, and then click Objective 7.

Chapter Summary

This chapter defined an operating system and then discussed the functions common to most operating systems. The chapter introduced a variety of stand-alone operating systems, server operating systems, and embedded operating systems. Finally, the chapter described several utility programs.

Computer Usage @ Work

Education

Teachers and students have been using computers in education for many years. Teachers have been taking advantage of advances in computer technology to help provide a better educational experience for their students.

Many grade schools throughout the United States, as well as other countries, enable parents to track their child's performance online. In the past, parents would rely solely on their child bringing home graded assignments and tests to know how he or she was doing. In some cases, parents would be surprised when they saw their child's grades on report cards every two to three

At the college level, many instructors today rely heavily on e-learning systems to provide students with Web-based access to course materials and assessments, discussion forums, chat rooms, and e-mail. Once used mainly in online classes, e-learning systems provide instructors with an easy way to allow students access to the class at any time of the day.

Most instructors go beyond e-learning systems and use additional technologies to enhance their classes. For example, digital media instructors might require students to upload their assignments to a photo sharing community, and an English instructor might save paper

High-Tech Talk

The High-Tech Talk article at the end of each chapter expands on a topic covered in the chapter and presents a more technical discussion.

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High-Tech Talk

Touch Screen Technology: How the Screen Is So Smart

Touch screen technology is becoming a larger part of everyday life for many individuals. As presented in Chapter 5, a touch screen is a touch-sensitive display device that users can interact with by touching areas of the screen. People have been using touch screens for more than 30 years, and this technology now is being used in more places, such as in smart phones, point-of-sale terminals, automated teller machines, remote controls, GPS receivers, home security systems, and Tablet PCs.

Touch screen technology has evolved since its creation in the late 1960s. The first touch screens developed allowed users to press only one area at a time with the tip of their finger, and they were much less accurate than today's touch screens. As the technology is advancing, users are able to perform additional tasks, such as dragging their finger across the screen and touching more than one area of the screen at a time. For example, the iPhone and iPod touch allow you to zoom in pictures or other objects on the screen by placing two fingers close together on the screen, and then slowly moving them apart. Three types of touch screens most in use today are capacitive, resistive,

electrical charge, reducing the charge on the capacitive layer. Circuits located at each corner of the capacitive touch screen measure the change in electrical charge. The circuits then send this data to the touch screen controller, or software that is running on the computer. The controller then uses the data to calculate the location where the finger is touching the screen. Capacitive touch screens typically are high-quality and unaffected by items that do not conduct electrical charges. An example of the components of a capacitive touch screen is shown in Figure 8-41.

The second type of touch screen is a resistive touch screen. A metallic conductive and resistive layer held apart by spacers cover a *resistive touch screen*. When a user touches a resistive touch screen, the conductive and resistive layers connect in the location of the touch. An electronic current runs between the two layers, and the interruption in the current enables the touch screen controller to calculate the exact location of the touch. Although resistive touch screens usually are more affordable than capacitive touch screens, they are not as clear and can be damaged more easily.

The third type of touch screen uses surface wave technology. Surface wave technology passes ultrasonic waves over the touch screen. Touching the screen absorbs portions of the waves, which then allows the

touch screen controller to calculate the position at which the object touched the screen. Because ultrasonic waves pass over the touch screen, it is easy for outside elements to damage the device. Touch screens using surface wave technology are the most advanced and often the most expensive of the three types.

Additional types of touch screen technologies exist, but they are not used as widely as the capacitive, resistive, and surface wave touch screens. *Optical touch screens* use cameras mounted at two corners of the screen to detect objects close to the surface. *Infrared touch screens* use light emitting diodes and light detectors at the edges of the touch screen to detect objects that break the beams of light traveling across the screen.

As touch screen prices continue to decrease, they most likely will be incorporated in an increasing number of computers and devices. Touch screens have increased productivity by allowing people to interact with devices more quickly than they can with a mouse or keyboard.

For more information, visit the Computer Concepts CourseMate Web site at www.cengagebrain.com, navigate to the Chapter 8 High-Tech Talk resource for this book, and then click Touch Screen Technology.

capacitive touch screen identifies where someone touches the screen by ces in electrical charges.

Operating Systems and Utility Programs Chapter 8 431

Companies on the Cutting Edge

VERISIGN Internet Infrastructure Services

Technology users desire immediate access to information and services. Their ability to communicate and conduct commerce securely is aided in large part by VeriSign. More than 30 billion times a day, people interact on the Internet, and their purchases, text messages, downloads, and other transactions are enabled and protected by VeriSign's infrastructure services.

Computer security company Semantic acquired VeriSign's Authentication division business in 2010 to strengthen encryption and identity services and help protect businesses and consumers by protecting information and detecting online fraud. Its domain name services department registers all .com, .net, .cc, and .tv domain names. The VeriSign Secured Seal, which has been issued to more than 100,000 domains in 145 countries, ensures companies and consumers that the Web site is secure.

The California-based company was founded in 1995 and has more than 2,200 employees worldwide.

RESEARCH IN MOTION (RIM) Wireless Mobile Communications Devices Manufacturer

By 2012, 800 million people worldwide are expected to access social networking Web sites on smart phones, up from 82 million in 2007. *Research in Motion (RIM)* helped fuel this networking frenzy by partnering with MySpace in 2008 to help connect networkers on the go. They can access MySpace Mobile on a BlackBerry smart phone, which is RIM's key product.

The Canadian company was founded in 1984 by Mike Lazaridis, who serves as its president and co-CEO. Lazaridis's vision for wireless technology developed in high school when he was a member of the local amateur radio and television club. He developed RIM's first major product, the Inter@ctive Pager, which was integrated in the first BlackBerry product in 1998. The BlackBerry gained attention for having the capability to combine a wireless mailbox with a corporate mailbox so that users could assess e-mail continuously.

Recently, Research in Motion launched BlackBerry App World, an application store that allows BlackBerry users to download personal and business programs.

For more information, visit the Computer Concepts CourseMate Web site at www.cengagebrain.com and then navigate to the Chapter 8 Companies on the Cutting Edge resource for this book.

Technology Trailblazers

STEVE WOZNIAK Apple Cofounder

Mixing fun with work comes naturally for *Steve Wozniak*. As Apple's cofounder, he says his computer designing career began and still continues to be a hobby filled with creativity, humor, games, and education. In his opinion, Apple's success evolved because he designed computers that had minimal parts and maximum performance.

Wozniak designed the original Apple computer in 1975 with Apple's current CEO, Steve Jobs, and wrote most of the software. Ten years later he cofounded Pixar, the award winning animation studio. He left Apple in 1985 to spend time with his family, work on community projects, and teach, but he still serves as an advisor to the corporation.

Wozinak was inducted into the Consumer Electronics Hall of Fame and the National Inventors Hall of Fame. One of his current passions is applying artificial intelligence to the area of robotics. He also is a member of the Silicon Valley Aftershocks, a polo team that plays using Segway electric transportation devices.

LINUS TORVALDS Linux Creator

Inductees to the Computer History Museum in Mountain View, CA, are noted for their contribution to computer technology. *Linus Torvalds* joined the Museum's Hall of Fellows in 2008 for his creation of the open source operating system, Linux.

When he developed an operating system in 1991, he announced his project in an Internet newsgroup. He made the source code available and asked readers for suggestions to enhance the product. Computer users responded by reviewing the system and offering enhancements. Three years later he released a greatly enhanced version he called Linux.

Torvalds developed this innovative operating system when he was a 21-year-old computer science student in Finland. Today, he leads the development of Linux as a fellow at OSDL (Open Source Development Labs), a not-for-profit consortium of companies dedicated to developing and promoting the operating system. Torvalds says his daily involvement with Linux involves coordinating and merging the lines of code submitted by users so that the software runs smoothly.

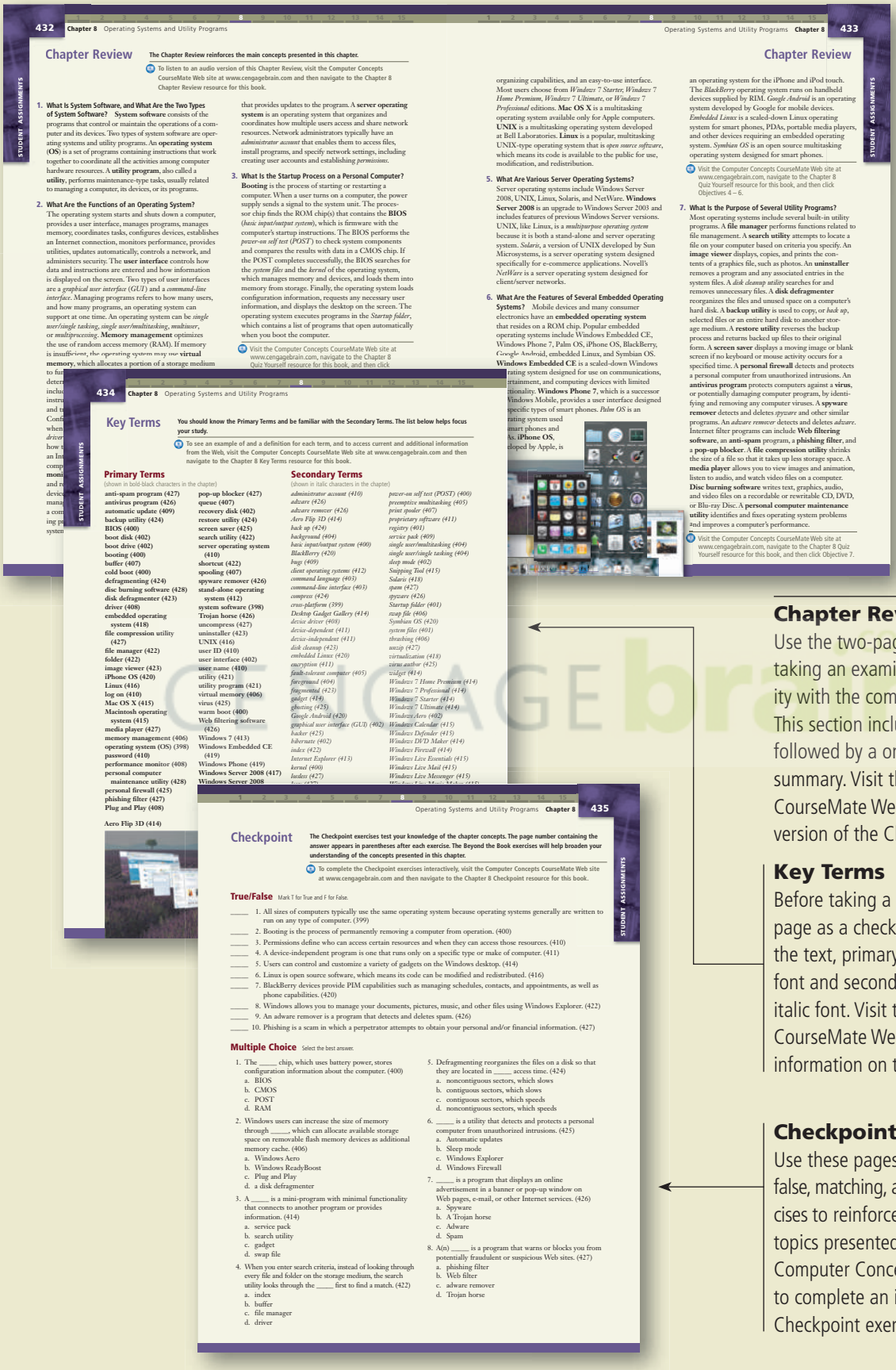
For more information, visit the Computer Concepts CourseMate Web site at www.cengagebrain.com and then navigate to the Chapter 8 Technology Trailblazers resource for this book.

Companies on the Cutting Edge and Technology Trailblazers

Everyone who interacts with computers should be aware of the key computer-related companies and of the more famous leaders of the computer industry.

STUDENT ASSIGNMENTS

End-of-Chapter Student Assignments



Chapter Review

Use the two-page Chapter Review before taking an examination to ensure familiarity with the computer concepts presented. This section includes each objective, followed by a one- or two-paragraph summary. Visit the Computer Concepts CourseMate Web site to hear an audio version of the Chapter Review.

Key Terms

Before taking a test, use the Key Terms page as a checklist of terms to know. In the text, primary key terms appear in bold font and secondary key terms appear in italic font. Visit the Computer Concepts CourseMate Web site for additional information on the Key Terms.

Checkpoint

Use these pages of multiple-choice, true/false, matching, and short answer exercises to reinforce understanding of the topics presented in the chapter. Visit the Computer Concepts CourseMate Web site to complete an interactive version of the Checkpoint exercises.

Learn It Online

The Learn It Online exercises, which include At the Movies online CNET videos, practice tests, interactive labs, learning games, and Web-based activities offer a wealth of online reinforcement.

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STUDENT ASSIGNMENTS

Learn It Online

The Learn It Online exercises are interactive Web exercises designed to reinforce and expand your understanding of the chapter concepts. The descriptions below briefly summarize each exercise.

To complete the Learn It Online exercises, visit the Computer Concepts CourseMate Web site at www.cengagebrain.com, navigate to the Chapter 8 resources for this book, click the link for the exercise you want to complete, and then read the instructions.

1. **At the Movies — Free Online Antivirus** Watch a movie to learn why it is important to run antivirus software on your computer and how to scan your computer for malware online for no cost and then answer questions about the movie.
2. **Video and Audio: You Review It — Spyware** Search for, choose, and write a review of a video, podcast, or vodcast that discusses spyware.
3. **Student Edition Labs — Installing and Uninstalling Software and Keeping Your Computer Virus Free** Enhance your understanding and knowledge about installing and uninstalling software and keeping your computer virus free by completing the Installing and Uninstalling Software and Keeping Your Computer Virus Free Labs.
4. **Practice Test** Take a multiple choice test that checks your knowledge of the chapter concepts and review the resulting study guide.
5. **Who Wants To Be a Computer Genius²?** Play the Shelly Cashman Series version of this popular game by answering questions to find out if you are a computer genius. Panic buttons are available to provide assistance during game play.
6. **Wheel of Terms** Identify important key terms presented in this chapter by playing the Shelly Cashman Series version of this popular game.
7. **You're Hired!** Embark on the path to a career in computers by answering questions and solving puzzles related to concepts discussed in this chapter.
8. **Crossword Puzzle Challenge** Complete an interactive crossword puzzle to reinforce concepts presented in this chapter.
9. **Windows Exercises** Step through the Windows 7 exercises to learn about Windows, using a screen saver, changing desktop colors, customizing the desktop for multiple users, and backing up a computer.
10. **Exploring Computer Careers** Read about a career as a systems programmer, search for related employment advertisements, and then answer related questions.
11. **Web Apps — PhotoshopExpress** Learn how to use PhotoshopExpress to upload new photos as well as photos stored on other photo sharing communities, edit photos, create new pictures, and share them with others.

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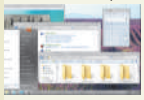
STUDENT ASSIGNMENTS

Problem Solving @ Home

The Problem Solving @ Home exercises extend your knowledge of the chapter concepts by seeking solutions to practical computer problems that you may encounter at home or school. The Collaboration exercise should be completed with a team.

In the real world, practical problems often can be solved in multiple ways. Provide one solution to each of the following problems using available resources, such as articles on the Web or in print, blogs, podcasts, videos, television, user guides, other individuals, and electronics and computer stores. You may need to use multiple resources to obtain an answer. Present your solutions in the form requested by your instructor (brief report, presentation, discussion, or other means).

1. **Computer Cannot Boot** You recently purchased a computer from a friend. When you turn on the computer, a message displays that says, "Operating system not found." What steps will you take before calling technical support?
2. **Improper Shut Down** During the startup process, your computer displays a message indicating that the computer did not shut down properly. You are certain that you shut down the computer properly when you last used it. The message also lists options to start Windows normally or start Windows in safe mode. How will you respond? Why?
3. **Incorrect Display Settings** You recently turned on your computer and noticed that the screen resolution, desktop background, and color scheme had changed, even though you have not changed the display settings since purchasing the computer several months ago. What might have caused Windows to change the display settings? What are your next steps?
4. **Unreadable Taskbar Buttons** While using your computer for a research project, you start multiple programs. With so many programs running, you are unable to determine which buttons correspond to each program. How can you determine which button to click to access the desired program?
5. **Poor Computer Performance** Your friend sends you an e-mail message stating that her computer is running slowly. She asks if you know of any programs that are included with Windows that will help increase her computer's performance. How will you respond?
6. **Maximum CPU Usage** Because your computer is performing slowly, you start the Windows Task Manager to investigate. You see that the CPU usage is near 100%. You are not aware of any other programs currently running. What might be causing this?
7. **Command Not Displaying** While using a computer in your school's computer lab, you decide to use the Control Panel to change the desktop background. When you click the Start button, the Control Panel command does not display on the Start menu. What could be the reason for this?
8. **Unwanted Programs** The new computer that you ordered online arrived today. You anxiously unpack it, connect all components, and then turn it on. After answering a series of questions to set up the computer, you notice it includes programs that you do not want. How will you remove these unwanted programs?



Collaboration

9. **Slow Computer** A fellow classmate has been complaining that his computer does not seem to be working properly. He complains that Windows takes too long to start and that it runs very slowly. You would like more practice troubleshooting computer problems, so you offer to look at his computer. When you start Windows, you notice that the hard disk has less than 100 MB of free space, many icons appear in the notification area, no antivirus software is installed, and more than 50 Windows updates are available for the computer. Form a team of three people and determine how to use the software that is included with Windows, in addition to any third-party software that may be needed, to resolve these computer problems. Compile your findings and submit them to your instructor.

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STUDENT ASSIGNMENTS

continue the boot process; however, you forgot the password. What are your next steps to allow the computer to continue the boot process, start Windows, and access the files on the hard disk?

3. **Frozen Manufacturer Logo** After turning on your computer, the computer manufacturer's logo displays on the monitor for several minutes. Suspecting that your computer might be frozen, you turn it off. Three minutes later, you turn the computer on and the same problem arises. What might be wrong?
4. **Automatic Updates** Two or three times per month, your coworker receives a notification on his computer that the computer recently has been updated. You ask your coworker about these messages, and he says that Microsoft periodically installs updates automatically to protect the computer from various threats, as well as to improve performance. You never have seen this for Windows Update. What could be causing this?
6. **Antivirus Schedule** You recently changed your work schedule so that you work until 6:00 p.m. instead of 5:00 p.m. At 5:00 p.m. each day, you notice that the antivirus program on your computer automatically begins scanning all files on your hard disk. This process slows your computer, and the program usually still is scanning when you leave the office. How can you change the configuration so that the antivirus program does not start until after you leave?
7. **Minimum Battery Power** When you use your notebook computer and it is not plugged in, the battery lasts for only one hour, but the documentation states that the computer can last for two hours on battery power. What are some ways that you can increase the battery life?

Collaboration

8. **Computers in Education** A private elementary school in your neighborhood has received a grant to create a computer lab with Internet access so that students can learn about computers and related technologies. Your neighbor, who also is a teacher at the school, asks for advice regarding how they should spend the grant money. Form a team of three people to determine the best configuration for the lab. One team member should research whether a PC or Mac is more beneficial. Another team member should research the application software that should be installed on these computers, and the other team member should determine what, if any, peripheral devices should be attached to the computers in the lab. Compile your findings and submit them to your instructor.

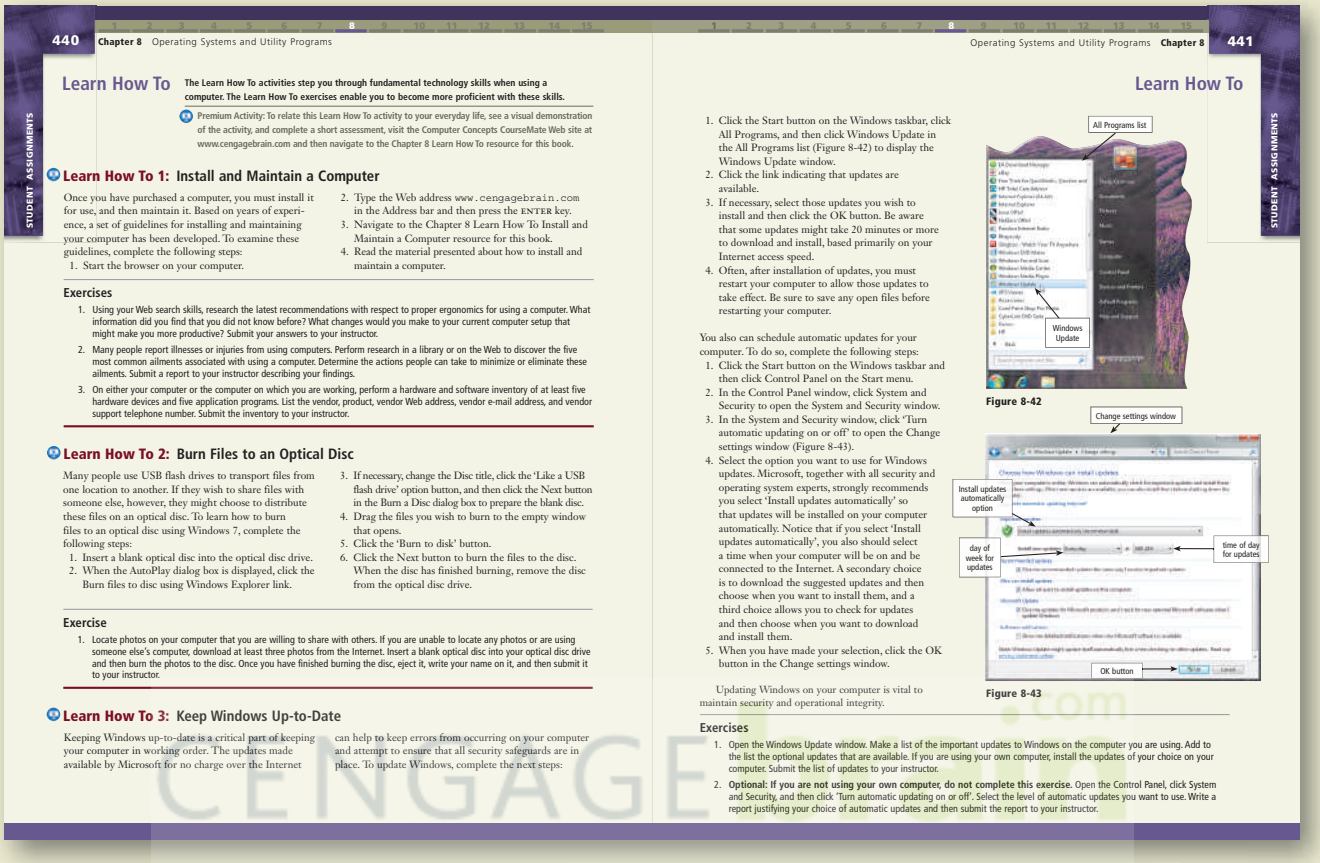
Problem Solving @ Home, Problem Solving @ Work, and Collaboration

Tackle everyday computer problems and put the information presented in each chapter to practical use with the Problem Solving @ Home and Problem Solving @ Work exercises. Work as a team to solve the Collaboration exercises.

STUDENT ASSIGNMENTS

Learn How To

Apply the concepts in the chapter to everyday life with these hands-on activities. Learn how the Learn How To activities fit into your life with relevant scenarios, visual demonstrations, and practice questions via the Computer Concepts CourseMate Web site.



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Learn How To

The Learn How To activities step you through fundamental technology skills when using a computer. The Learn How To exercises enable you to become more proficient with these skills.

Premium Activity: To relate this Learn How To activity to your everyday life, see a visual demonstration of the activity, and complete a short assessment, visit the Computer Concepts CourseMate Web site at www.cengagebrain.com and then navigate to the Chapter 8 Learn How To resource for this book.

Learn How To 1: Install and Maintain a Computer

Once you have purchased a computer, you must install it for use, and then maintain it. Based on years of experience, a set of guidelines for installing and maintaining your computer has been developed. To examine these guidelines, complete the following steps:

1. Start the browser on your computer.
2. Type the Web address www.cengagebrain.com in the Address bar and then press the ENTER key.
3. Navigate to the Chapter 8 Learn How To Install and Maintain a Computer resource for this book.
4. Read the material presented about how to install and maintain a computer.

Exercises

1. Using your Web search skills, research the latest recommendations with respect to proper ergonomics for using a computer. What information did you find that you did not know before? What changes would you make to your current computer setup that might make you more productive? Submit your answers to your instructor.
2. Many people report illnesses or injuries from using computers. Perform research in a library or on the Web to discover the five most common ailments associated with using a computer. Determine the actions people can take to minimize or eliminate these ailments. Submit a report to your instructor describing your findings.
3. On either your computer or the computer on which you are working, perform a hardware and software inventory of at least five hardware devices and five application programs. List the vendor, product, vendor Web address, vendor e-mail address, and vendor support telephone number. Submit the inventory to your instructor.

Learn How To 2: Burn Files to an Optical Disc

Many people use USB flash drives to transport files from one location to another. If they wish to share files with someone else, however, they might choose to distribute these files on an optical disc. To learn how to burn files to an optical disc using Windows 7, complete the following steps:

1. Insert a blank optical disc into the optical disc drive.
2. When the AutoPlay dialog box is displayed, click the Burn files to disc using Windows Explorer link.
3. If necessary, change the Disc title, click the 'Like a USB flash drive' option button, and then click the Next button in the Burn a Disc dialog box to prepare the blank disc.
4. Drag the files you wish to burn to the empty window that opens.
5. Click the 'Burn to disk' button.
6. Click the Next button to burn the files to the disc. When the disc has finished burning, remove the disc from the optical disc drive.

Exercise

1. Locate photos on your computer that you are willing to share with others. If you are unable to locate any photos or are using someone else's computer, download at least three photos from the Internet. Insert a blank optical disc into your optical disc drive and then burn the photos to the disc. Once you have finished burning the disc, eject it, write your name on it, and then submit it to your instructor.

Learn How To 3: Keep Windows Up-to-Date

Keeping Windows up-to-date is a critical part of keeping your computer in working order. The updates made available by Microsoft for no charge over the Internet can help to keep errors from occurring on your computer and attempt to ensure that all security safeguards are in place. To update Windows, complete the next steps:

1. Click the Start button on the Windows taskbar, click All Programs, and then click Windows Update in the All Programs list (Figure 8-42) to display the Windows Update window.
2. Click the link indicating that updates are available.
3. If necessary, select those updates you wish to install and then click the OK button. Be aware that some updates might take 20 minutes or more to download and install, based primarily on your Internet access speed.
4. Often, after installation of updates, you must restart your computer to allow those updates to take effect. Be sure to save any open files before restarting your computer.

You also can schedule automatic updates for your computer. To do so, complete the following steps:

1. Click the Start button on the Windows taskbar and then click Control Panel on the Start menu.
2. In the Control Panel window, click System and Security to open the System and Security window.
3. In the System and Security window, click 'Turn automatic updating on or off' to open the Change settings window (Figure 8-43).
4. Select the option you want to use for Windows updates. Microsoft, together with all security and operating system experts, strongly recommends you select 'Install updates automatically' so that updates will be installed on your computer automatically. Notice that if you select 'Install updates automatically', you also should select a time when your computer will be on and be connected to the Internet. A secondary choice is to download the suggested updates and then choose when you want to install them, and a third choice allows you to check for updates and then choose when you want to download and install them.
5. When you have made your selection, click the OK button in the Change settings window.

Updating Windows on your computer is vital to maintain security and operational integrity.

All Programs list

Windows Update

Figure 8-42

Change settings window

Install updates automatically option

day of week for updates

time of day for updates

OK button

Figure 8-43

Exercises

1. Open the Windows Update window. Make a list of the important updates to Windows on the computer you are using. Add to the list the optional updates that are available. If you are using your own computer, install the updates of your choice on your computer. Submit the list of updates to your instructor.
2. **Optional: If you are not using your own computer, do not complete this exercise.** Open the Control Panel, click System and Security, and then click 'Turn automatic updating on or off'. Select the level of automatic updates you want to use. Write a report justifying your choice of automatic updates and then submit the report to your instructor.

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Web Research

The Web Research exercises broaden your understanding of the chapter concepts by presenting questions that require you to search the Web for answers.

1 Search Sleuth
Use one of the search engines listed in Figure 2-10 in Chapter 2 on page 85 or your own favorite search engine to find the answers to the following questions. Copy and paste the Web address from the Web page where you found the answer. Some questions may have more than one answer. If required, submit your answers to your instructor. (1) Who are the "goons" who attend DEFCON? What color shirts do they wear? (2) Which product does IBM propose in its "Reincarnating PCs with Portable SoulPads" paper? (3) Which bird is the mascot for Linux? What is the mascot's name? (4) Why do some computer experts consider the term, spool, a backronym? (5) Who invented the Control-Alt-Delete (CTRL+ALT+DEL) key combination used to reboot a computer? (6) Which virus did the Farooq Alvi brothers invent? (7) Why are UNIX programmers concerned about the "Year 2038 problem"?

2 Green Computing
Operating systems can help monitor computer energy use and suggest methods of reducing electricity through efficient power management. Experts claim monitoring systems can save each computer user at least $60 per year in electricity costs. Suggestions include not using a screen saver, turning down a monitor's brightness level, and using a high performance power setting that balances processing power with notebook computer battery life. View online Web sites that provide information about power management. Which methods are effective in reducing power consumption, especially for notebook computers? Which sleep state setting gives significant power savings? Which power management settings are recommended for balanced, power saver, and high performance? Write a report summarizing your findings, and include a table of links to Web sites that provide additional details.

3 Social Networking
Social networking Web site advertisers in the United States spent $108 million in 2009, an increase of 119 percent in one year. Millions of registered online social networking users have posted demographic information about themselves, including age, gender, and geographical location. This data helps marketing managers deliver specific advertisements to each user in an attempt to raise revenue. Adknowledge (adknowledge.com) is one of the primary companies that gathers and studies data regarding online users and then sells targeted ads on social networking, e-mail, and gaming Web sites. Visit the Adknowledge Web site, view the information about targeting social network consumers, and then read articles in the About Us and Press Room sections. How are advertisers using virtual currency? How do traffic networks help advertisers create marketing campaigns? View the posts in the Adverblog Web site (adverblog.com) to read about interactive marketing trends. Summarize the information you read and viewed.

4 Blogs
A number of the search engine Web sites feature blogs describing popular search topics. Ask.com's blog (blog.ask.com), for example, lists its Blogroll, which gives recommended research and search engine Web sites. The Yahoo! Search blog (ysearchblog.com) includes news about consumer search trends (Yahoo! Buzz) and innovations in Web search technology. Google Blog Search (blogsearch.google.com) has search engines to help users find blogs about particular topics, including technology and business. Visit these sites and read the posts. What topics are discussed? Compose search queries about issues and products discussed in this chapter, such as personal firewalls or antivirus programs, and read a few of the blogs describing these topics. Summarize the information you read.

5 Ethics in Action
Several automobile insurers, including Progressive Casualty Insurance Company, are promising drivers insurance premium discounts up to 25 percent if they install a data recorder in their cars voluntarily to track their driving and then exercise good driving behavior. Privacy experts predict more insurance companies will offer this monitoring system and that it eventually will become mandatory. These critics fear that negative data will be used against poor drivers. View online sites that provide information about vehicle monitoring devices. Write a report summarizing your findings, and include a table of links to Web sites that provide additional details.

Web Research

Each Web Research exercise requires follow-up research on the Web and suggests writing a short article or presenting the findings of the research to the class.

Critical Thinking

Exercise your mind and construct creative solutions to these thought-provoking exercises presented in each chapter. The Critical Thinking exercises are constructed for class discussion, presentation, and independent research. The Collaboration exercise is designed for a team environment.

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STUDENT ASSIGNMENTS

Critical Thinking

The Critical Thinking exercises challenge your assessment and decision-making skills by presenting real-world situations associated with the chapter concepts. The Collaboration exercise should be completed with a team.

To evaluate the situations below, use personal experiences and available resources such as articles on the Web or in print, blogs, podcasts, videos, television, user guides, other individuals, and electronics and computer stores. You may need to use multiple resources to form conclusions and make recommendations.

1. **Class Discussion — Downloading Music** Many students at the local college have been using the college's computers to download music from the Internet. You have been asked to serve on a student committee to analyze and discuss this questionable use of the college's computers based on the following questions. Is it the college's responsibility to block music downloads? Why or why not? How would the college prevent students from downloading music? What is the difference between recording a song from the radio and downloading music from the Internet? Should violators be expelled, fined, required to attend a seminar on the ethical use of computers, or given a verbal warning? What recommendations would you give to the committee regarding the downloading of music?
2. **Class Presentation — Windows 7 Editions** Your cousin is buying a new computer both for personal use and for operating his consulting business, which he runs out of his home. He is undecided about which edition of the Windows 7 operating system to purchase with his new computer. Windows 7 Professional is intended for business users. Windows 7 Home Premium is designed for home computing. Windows 7 Ultimate contains features both for home and business users. He has asked you to review the differences between each edition and help him decide which he should buy. Prepare a presentation comparing the similarities and contrasting the differences among the three editions. Be sure to include items such as features that are included with one edition that are not available in another and cost differences. At the end of your presentation, provide a recommendation and the reasons why the edition you chose would be best.
3. **Research — Complete Security Solutions** Your neighbor started a new construction business and opened an office several blocks from your house. He is impressed by your computer knowledge and would like to hire you to set up his new computers. He mentions that because of the increasing security concerns on the Internet, he first would like you to install a program or programs designed to protect his computers from various security threats. What types of security threats exist on the Internet? Write a brief report describing two programs that provide a comprehensive security solution. What are the programs' functions? What computer requirements, if any, exist? Do the programs appear to be easy to install? What is their cost? Are subscription fees charged in order to receive automatic updates? In your opinion, are the programs worth the price? Why or why not?

Collaboration

4. **Operating Systems** Your team members are employed as analysts at Soap-n-Suds, an international manufacturer of laundry soaps. The company currently uses an early version of the Windows operating system on its 5,000 desktop computers. This year, the company plans to upgrade the operating system and, if necessary, its desktop computers. The vice president of information technology has asked your team to compare the latest desktop versions of the Windows operating system, Mac OS, and the Linux operating system. Assign each member of your team an operating system. Each member should use the Web and/or print media to develop a feature/benefit analysis along with the answers to the following questions. What is the initial cost of the operating system per computer? What are the memory and storage requirements? Will the operating system require the company to purchase new computers? Are training costs involved? Which operating system is best at avoiding viruses, spam, and spyware? Which operating system is easier to use? Why? Can the latest version of Microsoft Office run with the operating system? As a team, merge your findings into a team presentation and share your findings and recommendation with the class.

Special Features

Nine special features following Chapters 1, 2, 3, 6, 8, 11, 13, 14, and 15 encompass topics from the history of computers, to hot topics on the Web, including Web 2.0, to a buyer's guide, to the latest in new technology and digital communications.

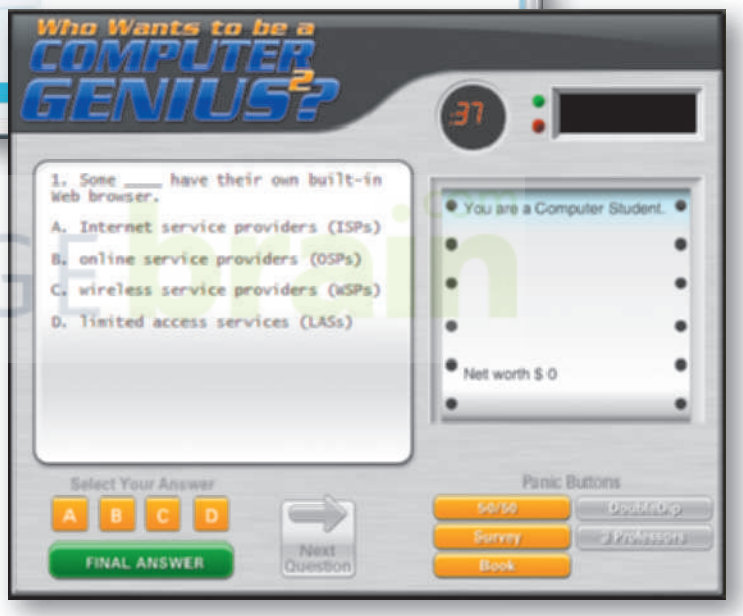
Visual Walkthrough of the Computer Concepts CourseMate for Discovering Computers

Interactive. Current. Engaging. Your Interactive Guide to the Digital World!

Introduce the most current technology into the classroom with the Computer Concepts CourseMate for Discovering Computers. An integrated e-book and a wide range of online learning games, quizzes, practice tests, videos, and Web links expand on the topics covered in the text with hands-on reinforcement. The Pointer Icon integrated into each page of the text illustrates when to access the CourseMate Web site and quickly shows students the connection between the text and the digital solution.

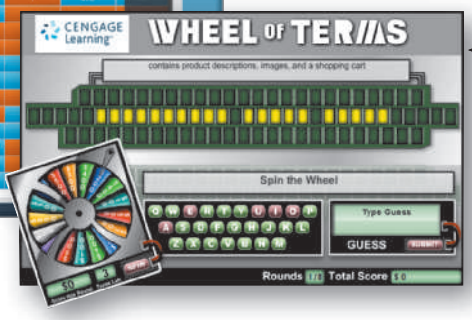
Who Wants to Be a Computer Genius?²

The Who Wants to Be a Computer Genius?² learning game allows students to quiz themselves on chapter content within a dynamic and entertaining game scenario. Question results are provided instantly so that students quickly see which concepts they understand and which concepts they need to study. Page remediation is included with question results so students know exactly where in the text to find the information they need.



EngagementTracker

EngagementTracker makes assessing students easy by tracking student progress on the interactive activities. Clear and visual reports illustrate the class progress as a whole.



Wheel of Terms

Wheel of Terms is an interactive study tool for learning the Key Terms in each chapter. This learning game presents students with a short definition of one of the chapter's Key Terms and prompts them to type the correct term as the answer.

Online Content

Student Edition Labs

Our Web-based interactive labs help students master hundreds of computer concepts, including input and output devices, file management and desktop applications, computer ethics, virus protection, and much more. Featuring up-to-the-minute content, eye-popping graphics, and rich animation, the highly interactive Student Edition Labs offer students an alternative way to learn through dynamic observation, step-by-step practice, and challenging review questions. Access the Student Edition Labs from the Discovering Computers: Your Interactive Guide to the Digital World Computer Concepts CourseMate Web site at www.cengagebrain.com or see the Student Edition Lab exercises on the Learn It Online pages at the end of each chapter. Also available on CD at an additional cost.

SAM 2010: Assessment & Training and Project Grading Solutions

SAM (Skills Assessment Manager) is a robust assessment, training and project-based system that enables students to be active participants in learning valuable Microsoft Office 2010 skills. A set of testbank questions ties directly to each chapter in this book. Let SAM be an integral part of your students' learning experience!

Content for Online Learning

Course Technology has partnered with the leading distance learning solution providers and class-management platforms today. To access this material, instructors will visit our password-protected instructor resources available at http://www.cengage.com/coursecare/cartridge/. Instructor resources include the following: additional case projects, sample syllabi, PowerPoint presentations per chapter, and more. For additional information or for an instructor username and password, please contact your sales representative. For students to access this material, they must have purchased a Course Cartridge PIN-code specific to this title and your campus platform. The resources for students may include (based on instructor preferences), but not limited to: topic review, review questions and practice tests.

CourseCasts Learning on the Go

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Our fast-paced world is driven by technology. You know because you are an active participant — always on the go, always keeping up with technological trends, and always learning new ways to embrace technology to power your life. Let CourseCasts, hosted by Ken Baldauf of Florida State University, be your guide to weekly updates in this ever-changing space. These timely, relevant podcasts are produced weekly and are available for download at http://coursecasts.course.com or directly from iTunes (search by CourseCasts). CourseCasts are a perfect solution to getting students (and even instructors) to learn on the go!

CourseNotes — Technology in a Flash!

Course Technology's CourseNotes are six-panel quick reference cards that reinforce the most important and widely used features of a software application in a visual and user-friendly format. CourseNotes serve as a great reference tool during and after the student completes the course. CourseNotes are available for software applications, such as Microsoft Office 2010, Word 2010, PowerPoint 2010, Excel 2010, Access 2010, and Windows 7. Topic-based CourseNotes are available for Best Practices in Social Networking, Hot Topics in Technology, and Web 2.0. Visit www.cengage.com/ct/coursenotes to learn more!

About Our Covers

The Shelly Cashman Series is continually updating our approach and content to reflect the way today's students learn and experience new technology. This focus on student success is reflected on our covers, which feature real students from Bryant University using the Shelly Cashman Series in their courses, and reflect the varied ages and backgrounds of the students learning with our books. When you use the Shelly Cashman Series, you can be assured that you are learning computer skills using the most effective courseware available.

Computer Acronyms

Acronym	Description	Page
0NF	zero normal form	540
1NF	first normal form	540
2NF	second normal form	540
3DES	Triple Data Encryption Standard (Triple-DES)	592
3GL	third-generation language	666
3NF	third normal form	540
4GL	fourth-generation language	674
AAC	Advanced Audio Coding	95
AC	alternating current	239
ACE	Adobe Certified Expert	804
ACI	Adobe Certified Instructor	804
ACM	Association for Computing Machinery	797
ADA	Americans with Disabilities Act	286
ADSL	asymmetric digital subscriber line	484
AES	Advanced Encryption Standard	592
AGP	Accelerated Graphics Port	238
AI	artificial intelligence	737
AIFF	Audio Interchange File Format	95
AIS	Association for Information Systems	797
AITP	Association of Information Technology Professionals	797
Ajax	Asynchronous JavaScript and XML	684
ALGOL	ALGOrithmic Language	675
ALU	arithmetic logic unit	213
AMD	Advanced Micro Devices	216, 217
ANN	artificial neural network	758
ANSI	American National Standards Institute	691
AOL	America Online	78, 89, 111
APCUG	Association of Personal Computer Users Group	798
API	application programming interface	684
APL	A Programming Language	675

Acronym	Description	Page
ARPA	Advanced Research Projects Agency	75
ARPANET	Advanced Research Projects Agency network	75
ASCII	American Standard Code for Information Interchange	221
ASF	Advanced Streaming (or Systems) Format	95
ATC	advanced transfer cache	227
ATM	Asynchronous Transfer Mode	485
ATM	automated teller machine	284
AUP	acceptable use policy	565
AWC	Association for Women in Computing	797
B2B	business-to-business	100
B2C	business-to-consumer	98
BAN	body area network	471
BASIC	Beginner's All-purpose Symbolic Instruction Code	675
BD-R	Blu-ray Disc recordable	376
BD-RE	Blu-ray Disc rewritable	376
BD-ROM	Blu-ray Disc read-only memory	375
BI	business intelligence	725
BIOS	basic input/output system	400
bit	binary digit	221, 518
BLOB	binary large object	518
BLS	Bureau of Labor Statistics	784
BMP	bit map	93
BPA	business process automation	726
BPM	business process management	725
BSA	Business Software Alliance	572
BSB	backside bus	237
btw	by the way	108
C2C	consumer-to-consumer	100
CA	certificate authority	574
CAD	computer-aided design	160, 728

Acronym	Description	Page
CAE	computer-aided engineering	728
CAI	computer-aided instruction	171
CAM	computer-aided manufacturing	38, 729
CAPTCHA	Completely Automated Public Turing test to tell Computers and Humans Apart	567
CASE	computer-aided software engineering	642
CAT	computerized adaptive testing	803
CATV	cable television	483
CBT	computer-based training	171
CCD	charge-coupled device	272
CCE	Certified Computer Examiner	806
CCFE	Certified Computer Forensics Examiner	806
CCIE	Cisco Certified Internetwork Expert	806
CCNA	Cisco Certified Network Associate	806
CCNP	Cisco Certified Network Professional	806
ccTLD	country code top-level domain	80
CD	compact disc	8, 94, 97, 375
CDMA	Code Division Multiple Access	495
CDP	continuous data protection	754
CD-R	compact disc-recordable	373
CD-ROM	compact disc read-only memory	372
CD-RW	compact disc-rewritable	373
CE	computer engineering	795
CEECS	Certified Electronic Evidence Collection Specialist	806
CEO	Chief Executive Officer	723
CERT/CC	Computer Emergency Response Team Coordination Center	558
CES	Consumer Electronics Show	798
CF	CompactFlash	364
CFO	Chief Financial Officer	723
CGI	Common Gateway Interface	537, 680
CIFI	Certified Information Forensics Investigator	806
CIM	computer-integrated manufacturing	729
CIM	customer interaction management	731
CIO	chief information officer	732, 788
CIPA	Children's Internet Protection Act	589
CIS	computer information systems	795
CISSP	Certified Information Systems Security Professional	807
CIW	Certified Internet Webmaster	807
CLP	Novell Certified Linux Professional	804
CLR	Common Language Runtime	670
CMOS	complementary metal-oxide semiconductor	229
CMS	content management system	739
coax	coaxial cable	493
COBOL	COmmon Business-Oriented Language	55, 668
COO	Chief Operating Officer	723
COPPA	Children's Online Privacy Protection Act	589
CPU	central processing unit	7, 213
CRM	customer relationship management	737
CRPG	computer role-playing game	829
CRT	cathode-ray tube	313
CS	computer science	795
CSC	common short code	464
CSDA	Certified Software Development Associate	805
CSDP	Certified Software Development Professional	805
CSO	chief security officer	646, 789
CSS	cascading style sheet	683
CTO	chief technology officer	788
CTS	carpal tunnel syndrome	579
CUG	C/C++ Users Group	798
CVS	computer vision syndrome	579
CWP	Certified Web Professional	807
DA	database analyst	538
DBA	database administrator	538
DBMS	database management system	515
DC	direct current	239
DDoS attack	distributed denial of service attack	562
DDR SDRAM	double data rate synchronous dynamic random access memory	225
DES	Data Encryption Standard	592
DFD	data flow diagram	632

Acronym	Description	Page
DHCP	Dynamic Host Configuration Protocol	110
DHTML	Dynamic Hypertext Markup Language	683
DIMM	dual inline memory module	225
DL	distance learning	176
DLP projector	digital light processing projector	326
DMCA	Digital Millennium Copyright Act	589
DMS	Document Management System	743
DNS	domain name system	80
DOM	document object model	683
DoS attack	denial of service attack	562
dpi	dots per inch	273, 316
DRAM	dynamic random access memory	225
DRM	digital rights management	582
DSL	Digital Subscriber Line	76, 484
DSS	decision support system	734
DTP	desktop publishing	160
DTV	digital television	312
DV camera	digital video camera	275
DVD	digital versatile disc or digital video disc	8, 26, 64, 68, 97, 375
DVD+R	digital versatile disc or digital video disc recordable	376
DVD-R	digital versatile disc or digital video disc recordable	376
DVD+RAM	digital versatile disc or digital video disc + random access memory	376
DVD-ROM	digital versatile disc or digital video disc read-only memory	375
DVD+RW	digital versatile disc or digital video disc + rewritable	376
DVD-RW	digital versatile disc or digital video disc + rewritable	376
DVI	Digital Video Interface	310
EB	exabyte	354
e-commerce	electronic commerce	30, 32, 62, 63, 98, 100,109
ECPA	Electronic Communications Privacy Act	589
EDGE	Enhanced Data GSM Environment	495
EDI	electronic data interchange	471, 742
EEPROM	electrically erasable programmable read-only memory	228
e-filing	electronic filing	167

Acronym	Description	Page
e-form	electronic form	530
EFS	Encrypting File System	592
EFT	electronic funds transfer	471
EIDE	Enhanced Integrated Drive Electronics	361
EIS	executive information system	735
e-mail	electronic mail	12, 31, 74, 75, 77, 78, 81, 88, 89, 91, 98, 100, 101, 102, 103, 105, 108, 109, 142, 144, 150, 156, 157, 159, 173,174, 176
ENIAC	Electronic Numerical Integrator and Computer	54
ERD	entity-relationship diagram	632
e-retail	electronic retail	99, 747
ERM system	employee relationship management system	728
ERP	enterprise resource planning	738
eSATA	external Serial Advanced Technology Attachment	361
EULA	end-user license agreement	571
EVDO	Evolution Data Optimized	495
e-zine	electronic magazine	638
FAQ	frequently asked questions	14, 108
fax	facsimile	320, 321
FEK	file encryption key	592
FORTRAN	FORmula TRANslator	55, 675
FRED	Forensic Recovery of Digital Evidence	613
FSB	front side bus	237
FTP	File Transfer Protocol	107, 462, 482
FTTB	Fiber to the Building	484
FTTH	Fiber to the Home	484
FTTP	Fiber to the Premises	76
fwiw	for what it's worth	108
fyi	for your information	108
GB	gigabyte	223, 354
GBps	gigabytes per second	355
Gbps	gigabits per second	478
GHz	gigahertz	216
GIF	Graphics Interchange Format	93
GIGO	garbage in, garbage out	516
GIS	geographic information system	534

Acronym	Description	Page
GLBA	Graham-Leach-Bliley Act	589
GPRS	General Packet Radio Service	595
GPS	global positioning system	466
GPU	graphics processing unit	310
GSM	Global System for Mobile Communications	495
gTLD	generic top-level domain	80
GUI	graphical user interface	15, 402
GWT	Google Web Toolkit	714, 716
HD	high density	375
HD VMD	high-density Versatile Multilayer Disc	375
HDMI	High-Definition Media Interface	310
HDTV	high-definition television	312
HIPAA	Health Insurance Portability and Accountability Act	380
HMD	head-mounted display	308
HP	Hewlett-Packard	319, 331
HR	Human Resources	727
HRIS	Human Resources Information Systems	728
HTML	Hypertext Markup Language	678
HTPC	home theater PC	20
http	Hypertext Transfer Protocol	82, 462
IACRB	Information Assurance Certification Review Board	806
IACSS	International Association for Computer Systems Security	797
IBM	International Business Machines	55, 56, 57, 58, 67, 76, 146
ICANN	Internet Corporation for Assigned Names and Numbers	80
I-CASE	integrated computer-aided software engineering	642
ICCA	Independent Computer Consultants Association	797
ICCP	Institute for the Certification of Computing Professionals	801
ICRA	Internet Content Rating Association	591
ICSA Labs	International Computer Security Association Labs	646
IDE	integrated development environment	669
IDEA	International Data Encryption Algorithm	592

Acronym	Description	Page
IEEE	Institute of Electrical and Electronics Engineers	797
IM	instant messaging	104
IMDb	Internet Movie Database	125
imho	in my humble opinion	108
IOUG	Independent Oracle Users Group	798
IP	intellectual property	582
IP address	Internet Protocol address	79, 110
IPng	Internet Protocol Next Generation	110
IPO chart	input, processing, output chart	687
IPv6	Internet Protocol version 6	80,110
IR	infrared	494
IrDA	Infrared Data Association	235, 480
IS	information system	27, 620
ISDN	Integrated Services Digital Network	484
ISP	Internet service provider	78
ISSA	International Systems Security Association	797
IT	information technology	27
JAD session	joint-application design session	626
JIT compiler	just-in-time compiler	670
JPEG	Joint Photographic Experts Group	93
JUG	Java Users Groups	798
K	kilobyte	223
KB	kilobyte	223, 354
KBps	kilobytes per second	355
Kbps	kilobits per second	480
KM	knowledge management	737
KMS	knowledge management software	737
L1 cache	Level 1 cache	227
L2 cache	Level 2 cache	227
L3 cache	Level 3 cache	227
LAN	local area network	57, 472
LCD	liquid crystal display	308
LINQ	Language Integrated Query	671
LISP	LISt Processing	675
LUGWW	Linux Users Group WorldWide	798
M2	Memory Stick Micro	364

Acronym	Description	Page
Mac OS	Macintosh Operating System	415
Mac OS X	Macintosh Operating System X	415
MAN	metropolitan area network	473
MB	megabyte	223, 354
MBps	megabytes per second	355
MBps	megabits per second	375
MCAP	Microsoft Certified Application Professional	804
MCAS	Microsoft Certified Application Specialist	804
MCDST	Microsoft Certified Desktop Support Technician	804
MCITP	Microsoft Certified IT Professional	804, 808
m-commerce	mobile commerce	98
MCPD	Microsoft Certified Professional Developer	805
MCSA	Microsoft Certified Systems Administrator	806
MCTS	Microsoft Certified Technology Specialist	804
MFP	multifunction peripheral	320, 329, 331
MHz	megahertz	229
MIB	Medical Information Bureau	380
MICR	magnetic-ink character recognition	281
MIS	management information system	734
MLP	multilayer perception	758
MMOG	massively multiplayer online game	829
MMS	multimedia message service	464
modem	modulate/demodulate	8, 461, 485
MP	million pixels	273
MP3	Moving Pictures Experts Group Audio Layer 3 (MPEG-3)	94, 95
MPEG	Moving Pictures Experts Group	96
MRAM	magnetoresistive random access memory	225
MRP	Material Requirements Planning	729
MRP II	Manufacturing Resource Planning II	730
µs	microsecond	229
ms	millisecond	229
MSIL	Microsoft Intermediate Language	670
MSN	Microsoft Network, The	78, 81, 85, 89
MT/ST	Magnetic Tape/Selectric Typewriter	56

Acronym	Description	Page
MX	mail exchange	382
NAP	National Association of Programmers	797
NAS	network attached storage	360, 749
NCA	Novell Certified Administrator	806
NCE	Novell Certified Engineer	806
NET Act	No Electronic Theft Act	589
netiquette	Internet etiquette	108
NIC	network interface card	487
NLQ	near letter quality	322
ns	nanosecond	229
NSF	National Science Foundation	75
OCP	Oracle Certified Professional	808
OCR	optical character recognition	279
OIS	office information system	732
OLAP	online analytical processing	735
OLE	object linking and embedding	59
OLED	organic light emitting diode	308
OLTP	online transaction processing	733
OMR	optical mark recognition	279
OO	object-oriented	634, 689
OODB	object-oriented database	534
OOP language	object-oriented programming language	669
OQL	object query language	535
OS	operating system	398
OSI reference model	Open Systems Interconnection reference model	498
OSP	online service provider	78
P2P	peer-to-peer	475
PATRIOT Act	Provide Appropriate Tools Required to Intercept and Obstruct Terrorism Act	589
PB	petabyte	354
PC	personal computer	19, 20
PCI bus	Peripheral Component Interconnect bus	238
PCIe	PCI Express	238
PCL	Printer Control Language	319
PCS	Personal Communications Services	496
PDA	personal digital assistant	22
PDF	Portable Document Format	158

Acronym	Description	Page
PDL	page description language	319
PDLC	program development life cycle	686
Perl	Practical Extraction and Report Language	682
PERT	Program Evaluation and Review Technique	624
PGP	Pretty Good Privacy	574
PHP	PHP: Hypertext Preprocessor	682
PILOT	Programmed Inquiry Learning Or Teaching	675
PIM	personal information manager	156
PIN	personal identification number	284, 568
pixel	picture element	273, 278, 308
PL/I	Programming Language One	675
PNG format	Portable Network Graphics format	93
POP	Post Office Protocol	103
POP3	Post Office Protocol 3	103
POS	point of sale	284
POST	power-on self test	400
ppi	pixels per inch	273
Prolog	PROgramming LOGic	675
PROM chip	programmable read-only memory chip	228
ps	picosecond	229
PSTN	public switched telephone network	482
PUE	power usage effectiveness	583
QBE	query by example	528
QT	QuickTime	95
RA	RealAudio	95
RAD	rapid application development	669
RAID	redundant array of independent disks	360, 748
RAM	random access memory	224
RDRAM	Rambus dynamic random access memory	225
Rexx	REstructured eXtended eXecutor	682
RFI	request for information	638
RFID	radio frequency identification	280, 481
RFP	request for proposal	638
RFQ	request for quotation	638
RHCE	Red Hat Certified Engineer	804
RHCT	Red Hat Certified Technician	804
RIAA	Recording Industry Association of America	64
RIMM	Rambus inline memory module	225
ROM	read-only memory	228
RoR	Ruby on Rails	683
RPG	Report Program Generator	675
rpm	revolutions per minute	358
RSI	repetitive strain injury	579
RSS 2.0	Really Simple Syndication	92, 679
RTLS	real time location system	570
RUP	Rational Unified Process	634
SAN	storage area network	749
SAS	serial-attached SCSI	235, 362
SATA	Serial Advanced Technology Attachment	361
SCEA	Sun Certified Enterprise Architect	805
SCJD	Sun Certified Java Developer	805
SCJP	Sun Certified Java Programmer	805
SCMAD	Sun Certified Mobile Application Developer	805
SCNA	Security Certified Network Architect	807
SCNA	Sun Certified Network Administrator	806
SCNP	Security Certified Network Professional	807
SCNS	Security Certified Network Specialist	807
SCSA	Sun Certified System Administrator	804
SCSI	small computer system interface	235, 362
SD	Secure Digital	364
SDHC	Secure Digital High Capacity	364
SDLC	system development life cycle	620
SDRAM	synchronous dynamic random access memory	225
SFA	sales force automation	730
S-HTTP	secure hypertext transfer protocol	575
SIGs	special interest groups	797
SIMM	single inline memory module	225
SMB	small- and medium-sized business	720
SMS	short message service	463
SMTP	simple mail transfer protocol	103

Acronym	Description	Page
SOA	service-oriented architecture	743
SOHO	small office/home office	30
SQL	Structured Query Language	534, 674
SRAM	static random access memory	225
SSCP	Systems Security Certified Practitioner	807
SSD	solid state drive	363
SSID	service set identifier	578
SSL	Secure Sockets Layer	575
SUT	system under test	648
SVG	Standard Vector Graphics	698
SVGA	Super Video Graphics Array	311
SXGA	Super Extended Graphics Array	311
TB	terabyte	223, 354
Tcl	Tool Command Language	682
TCP/IP	Transmission Control Protocol/ Internet Protocol	478
TFT display	thin-film transistor display	308
TIFF	Tagged Image File Format	93
TLD	top-level domain	80
TLS	Transport Layer Security	575
TPC-W	Transaction Processing Performance Council Workload	648
TPS	transaction processing system	733
TTL	Time To Live	382
ttfn	ta ta for now	108
tyvm	thank you very much	108
UL 1449 standard	Underwriters Laboratories 1449 standard	576
UMD	Universal Media Disc	375
UML	Unified Modeling Language	634, 692
UMPC	Ultra-Mobile PC	22
UMTS	Universal Mobile Telecommunications System	495
UNIVAC I	UNIVersal Automatic Computer	54
UPC	Universal Product Code	280
UPS	uninterruptible power supply	576
URL	Uniform Resource Locator	82
USB	universal serial bus	234, 367
user ID	user identification	410
UWB	ultra-wideband	480

Acronym	Description	Page
UXGA	Ultra Extended Graphics Array	311
VAN	value-added network	471
VAR	value-added reseller	638
VBA	Visual Basic for Applications	676
VBScript	Visual Basic, Scripting Edition	683
VoIP	Voice over Internet Protocol	100, 325
VPE	visual programming environment	673
VPN	virtual private network	575, 744
VR	virtual reality	96
VSTO	Visual Studio Tools for Office	671
W3C	World Wide Web Consortium	76
WAN	wide area network	473
WAP	Wireless Application Protocol	482
WAV	Windows waveform	95
WBT	Web-based training	181
Wi-Fi	wireless fidelity	76, 479
WiMAX	Worldwide Interoperability for Microwave Access	482
WIPS	Web Interactions Per Second	648
WIRT	Web Interaction Response Time	648
WISP	wireless Internet service provider	462
WLAN	wireless local area network	472
WMA	Windows Media Audio	95, 98
WML	wireless markup language	679
WPA	Wi-Fi Protected Access	578
WQXGA	Wide Quad Extended Graphics Array	311
WSXGA	Wide Super Extended Graphics Array	311
WUXGA	Wide Ultra Extended Graphics Array	311
WWW	World Wide Web	80
WXGA	Wide Extended Graphics Array	311
XGA	Extended Graphics Array	311
XHTML	Extensible Hypertext Markup Language	678
XML	Extensible Markup Language	468, 679
XP	extreme programming	695
XSL	Extensible Stylesheet Language	679
XSLT	Extensible Style Language Transformations	679
YB	yottabyte	354
ZB	zettabyte	354

Coding Schemes and Number Systems

Coding Schemes

As discussed in Chapter 4, a computer uses a coding scheme to represent characters. This section of the appendix presents the ASCII, EBCDIC, and Unicode coding schemes and discusses parity.

ASCII and EBCDIC

Two coding schemes that represent characters in a computer are ASCII and EBCDIC. The **American Standard Code for Information Interchange**, or ASCII (pronounced ASK-ee), coding scheme is the most widely used coding scheme to represent data. The **Extended Binary Coded Decimal Interchange Code**, or EBCDIC (pronounced EB-see-dik), coding scheme sometimes is used on mainframe computers and high-end servers. As shown in Figure C-1, the combination of bits (0s and 1s) is unique for each character in the ASCII and EBCDIC coding schemes.

When a computer uses the ASCII or EBCDIC coding scheme, it stores each represented character in one byte of memory. Other binary formats exist, however, that the computer sometimes uses to represent numeric data. For example, a computer may store, or pack, two numeric characters in one byte of memory. The computer uses these binary formats to increase storage and processing efficiency.

Unicode

The 256 characters and symbols that are represented by ASCII and EBCDIC codes are sufficient for English and western European languages but are not large enough for Asian and other languages that use different alphabets. Further compounding the problem is that many of these languages use symbols, called **ideograms**, to represent multiple words and ideas. One solution to this situation is Unicode. **Unicode** is a 16-bit coding scheme that has the capacity of representing all the world's current languages, as well as classic and historical languages, in more than 65,000 characters and symbols.

Unicode is implemented in several operating systems, including Windows, Mac OS, and Linux. Unicode-enabled programming languages and software include Java, XML, Microsoft Office, and Oracle. Some experts believe that Unicode eventually will replace all other coding schemes.

ASCII	SYMBOL	EBCDIC
00110000	0	11110000
00110001	1	11110001
00110010	2	11110010
00110011	3	11110011
00110100	4	11110100
00110101	5	11110101
00110110	6	11110110
00110111	7	11110111
00111000	8	11111000
00111001	9	11111001
01000001	A	11000001
01000010	B	11000010
01000011	C	11000011
01000100	D	11000100
01000101	E	11000101
01000110	F	11000110
01000111	G	11000111
01001000	H	11001000
01001001	I	11001001
01001010	J	11010001
01001011	K	11010010
01001100	L	11010011
01001101	M	11010100
01001110	N	11010101
01001111	O	11010110
01010000	P	11010111
01010001	Q	11011000
01010010	R	11011001
01010011	S	11100010
01010100	T	11100011
01010101	U	11100100
01010110	V	11100101
01010111	W	11100110
01011000	X	11100111
01011001	Y	11101000
01011010	Z	11101001
00100001	!	01011010
00100010	"	01111111
00100011	#	01111011
00100100	$	01011011
00100101	%	01101100
00100110	&	01010000
00101000	(	01001101
00101001	)	01011101
00101010	*	01011100
00101011	+	01001110

Figure C-1

A Unicode code for a symbol (Figure C-2) is obtained by appending the symbol's corresponding digit in the left-most column to the end of the symbol's corresponding three-digit code in the column heading. For example, the Unicode for the capital letter C is 0043. In Unicode, 30,000 codes are reserved for future use, such as ancient languages, and 6,000 codes are reserved for private use. Existing ASCII coded data is fully compatible with Unicode because the first 256 codes are the same.

Parity

Regardless of the coding scheme used to represent characters in memory, it is important that the computer store characters accurately. For each byte of memory, most computers have at least one extra bit, called a **parity bit**, that the computer uses for error checking. A parity bit can detect if one of the bits in a byte has been changed inadvertently. While such errors are extremely rare (most computers never have a parity error during their lifetime), they can occur because of voltage fluctuations, static electricity, or a memory failure.

Computers are either odd- or even-parity machines. In computers with odd parity, the total number of on bits in the byte (including the parity bit) must be an odd number (Figure C-3). In computers with even parity, the total number of on bits must be an even number. The computer checks parity each time it uses a memory location. When the computer moves data from one location to another in memory, it compares the parity bits of both the sending and receiving locations to see if they are the same. If the computer detects a difference or if the wrong number of bits is on (e.g., an odd number in a computer with even parity), an error message is displayed. Many computers use multiple parity bits that enable them to detect and correct a single-bit error and detect multiple-bit errors.

	003	004	005	006	007
0	0 0030	@ 0040	P 0050	` 0060	p 0070
1	1 0031	A 0041	Q 0051	a 0061	q 0071
2	2 0032	B 0042	R 0052	b 0062	r 0072
3	3 0033	C 0043	S 0053	c 0063	s 0073
4	4 0034	D 0044	T 0054	d 0064	t 0074
5	5 0035	E 0045	U 0055	e 0065	u 0075
6	6 0036	F 0046	V 0056	f 0066	v 0076
7	7 0037	G 0047	W 0057	g 0067	w 0077
8	8 0038	H 0048	X 0058	h 0068	x 0078
9	9 0039	I 0049	Y 0059	i 0069	y 0079
A	: 003A	J 004A	Z 005A	j 006A	z 007A
B	; 003B	K 004B	[005B	k 006B	{ 007B
C	< 003C	L 004C	\ 005C	l 006C	| 007C
D	= 003D	M 004D	] 005D	m 006D	} 007D
E	> 003E	N 004E	^ 005E	n 006E	~ 007E
F	? 003F	O 004F	_ 005F	o 006F	DEL 007F

Figure C-2

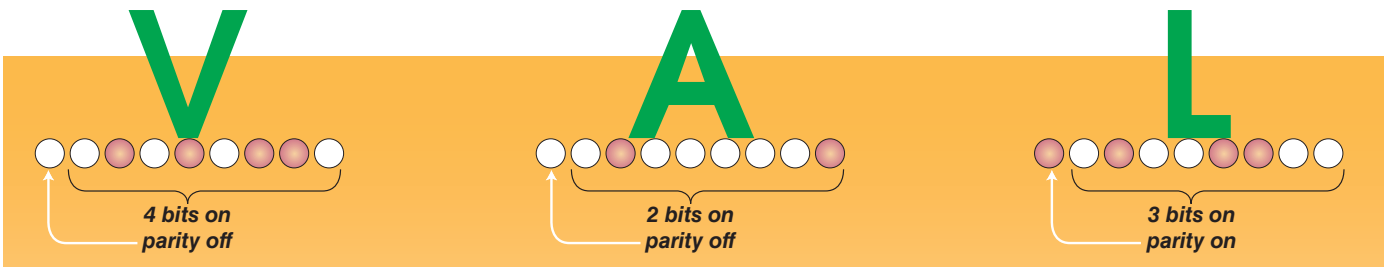

Figure C-3

Number Systems

This section of the appendix describes the number systems used with computers. Technical computer personnel require a thorough knowledge of this subject, but most users need only a general understanding of number systems and how they relate to computers.

The binary (base 2) number system is used to represent the electronic status of the bits in memory. It also is used for other purposes such as addressing the memory locations. Another number system commonly used with computers is **hexadecimal** (base 16). The computer uses the hexadecimal number system to communicate with a programmer when a problem with a program exists, because it would be difficult for the programmer to understand the 0s and 1s of binary code. Figure C-4 shows how the decimal values 0 through 15 are represented in binary and hexadecimal number systems.

DECIMAL	BINARY	HEXADECIMAL
0	0000	0
1	0001	1
2	0010	2
3	0011	3
4	0100	4
5	0101	5
6	0110	6
7	0111	7
8	1000	8
9	1001	9
10	1010	A
11	1011	B
12	1100	C
13	1101	D
14	1110	E
15	1111	F

Figure C-4

The mathematical principles that apply to the binary and hexadecimal number systems are the same as those that apply to the decimal number system. To help you better understand these principles, this section starts with the familiar decimal system, then progresses to the binary and hexadecimal number systems.

The Decimal Number System

The decimal number system is a base 10 number system (deci means ten). The base of a number system indicates how many symbols it uses. The decimal number system uses 10 symbols: 0 through 9. Each of the symbols in the number system has a value associated with it. For example, 3 represents a quantity of three and 5 represents a quantity of five.

The decimal number system also is a positional number system. This means that in a number such as 143, each position in the number has a value associated with it. When you look at the decimal number 143, the 3 is in the ones, or units, position and represents three ones (3×1); the 4 is in the tens position and represents four tens (4×10); and the 1 is in the hundreds position and represents one hundred (1×100). The number 143 is the sum of the values in each position of the number ($100 + 40 + 3 = 143$). The chart in Figure C-5 shows how you can calculate the positional values (hundreds, tens, and ones) for a number system. Starting on the right and working to the left, the base of the number system, in this case 10, is raised to consecutive powers (10^0, 10^1, 10^2). These calculations are a mathematical way of determining the place values in a number system.

When you use number systems other than decimal, the same principles apply. The base of the number system indicates the number of symbols that it uses, and each position in a number system has a value associated with it. By raising the base of the number system to consecutive powers beginning with zero, you can calculate the positional value.

power of 10	10^2	10^1	10^0	1		4		3	=	
positional value	100	10	1	(1×10^2)	+	(4×10^1)	+	(3×10^0)	=	
number	1	4	3	(1×100)	+	(4×10)	+	(3×1)	=	
				100	+	40	+	3	=	143

Figure C-5

The Binary Number System

As previously discussed, binary is a base 2 number system (bi means two), and the symbols it uses are 0 and 1. Just as each position in a decimal number has a place value associated with it, so does each position in a binary number. In binary, the place values, moving from right to left, are successive powers of two (2^0, 2^1, 2^2, 2^3 or 1, 2, 4, 8). To construct a binary number, place ones in the positions where the corresponding values add up to the quantity you want to represent and place zeros in the other positions. For example, in a four-digit binary number, the binary place values are (from right to left) 1, 2, 4, and 8. The binary number 1001 has ones in the positions for the values 1 and 8 and zeros in the positions for 2 and 4. Therefore, as shown in Figure C-6, the quantity represented by binary 1001 is 9 (8 + 0 + 0 + 1).

The Hexadecimal Number System

The hexadecimal number system uses 16 symbols to represent values (hex means six). These include the symbols 0 through 9 and A through F (Figure C-4 on the previous page). The mathematical principles previously discussed also apply to hexadecimal (Figure C-7).

The primary reasons the hexadecimal number system is used with computers are (1) it can represent binary values in a more compact and readable form, and (2) the conversion between the binary and the hexadecimal number systems is very efficient.

An eight-digit binary number (a byte) can be represented by a two-digit hexadecimal number. For example, in the ASCII code, the character M is represented as 01001101. This value can be represented in the hexadecimal number system as 4D. One way to convert this binary number (4D) to a hexadecimal number is to divide the binary number (from right to left) into groups of four digits, calculate the value of each group, and then change any two-digit values (10 through 15) to the symbols A through F that are used in the hexadecimal number system (Figure C-8).

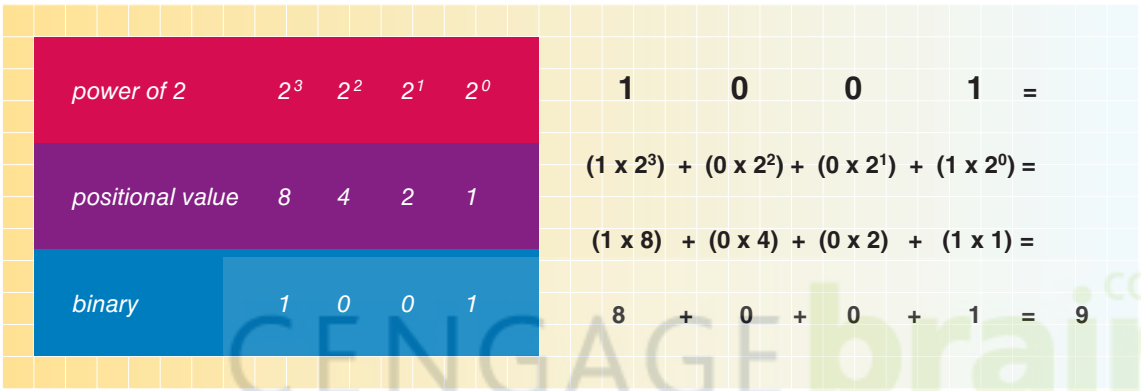

Figure C-6

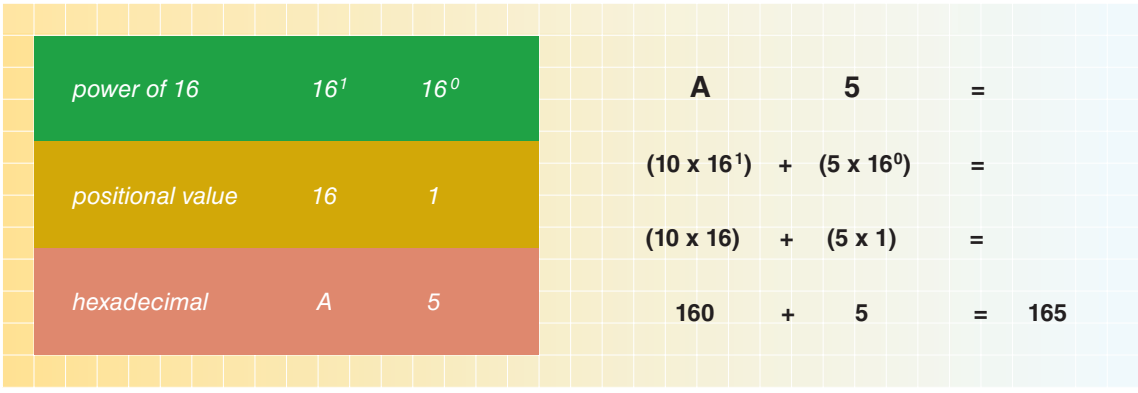

Figure C-7

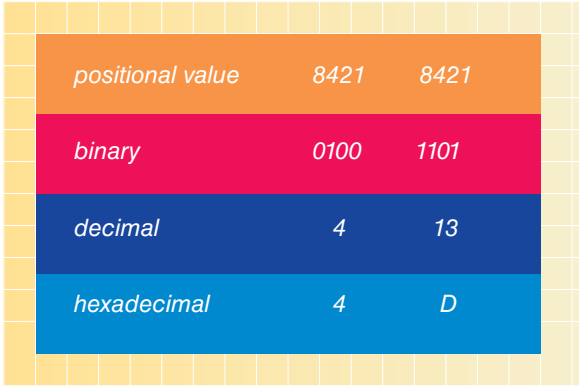

Figure C-8

Index

C

F

M

Credits

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