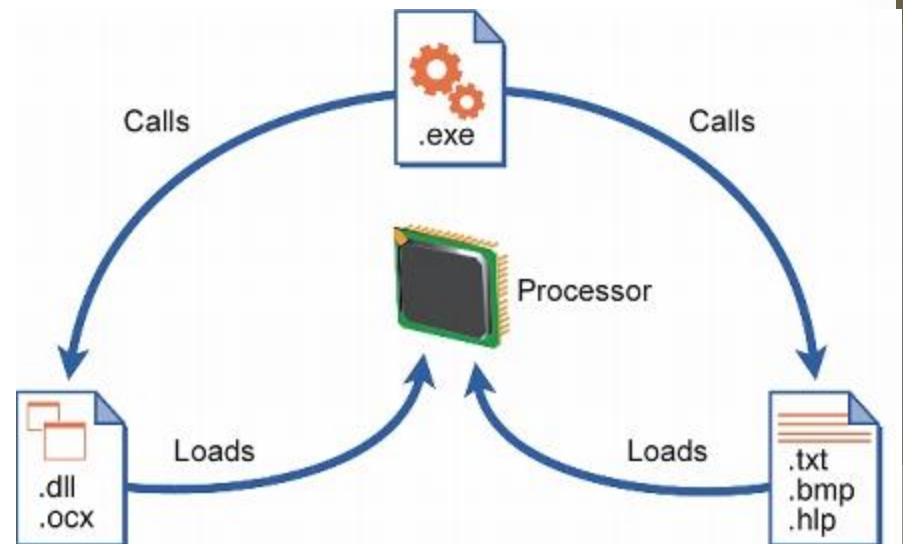# Software of Personal Computers

Software Basics

- Software: The Inside Story
- Programmers and Programming Languages
- How Software Works
- Application Software and System Software

Software: The Inside Story

- Software may come on a CD or DVD, or as a Web download
- Today's software is generally comprised of many files

Programmers and Programming Languages

- Computer programmers write computer programs
- The finished software product is distributed by the programmers or software publishers
- A programming language provides the tools a programmer uses to create software
  - Source code
  - High-level language

How Software Works

- Microprocessors understand only machine language
- A compiler translates high-level language instructions to object code (machine language instructions)
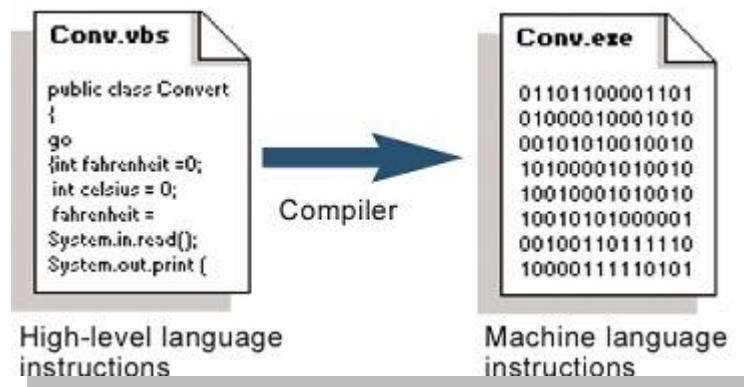
Application Software and System Software

- Application software helps people carry out tasks using a computer
- System software helps the computer carry out basic operating functions

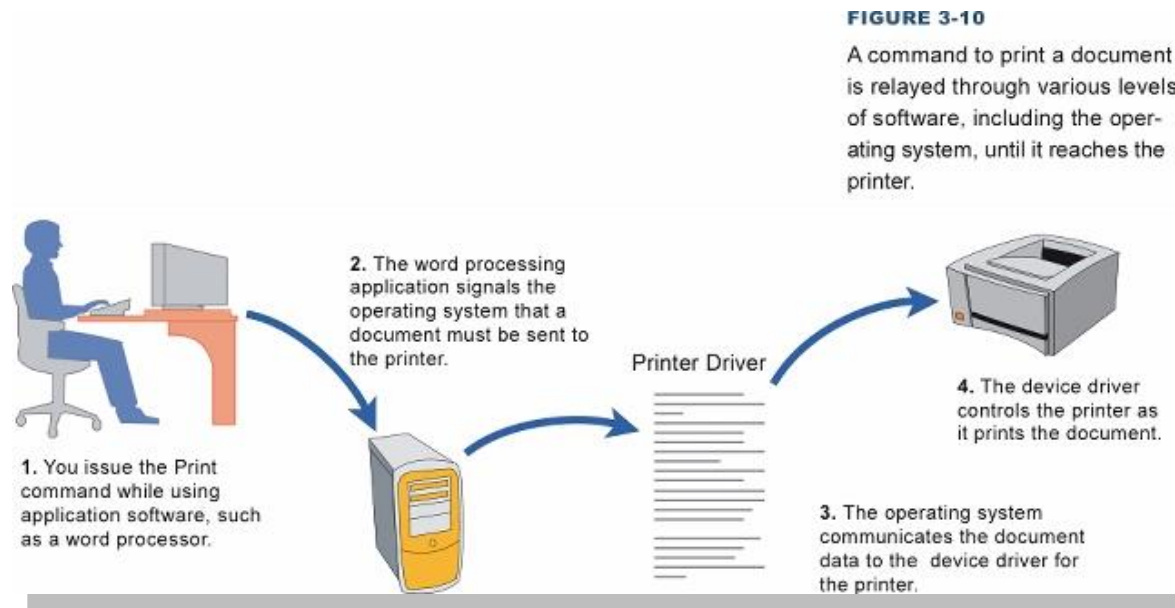# Application Software and System Software
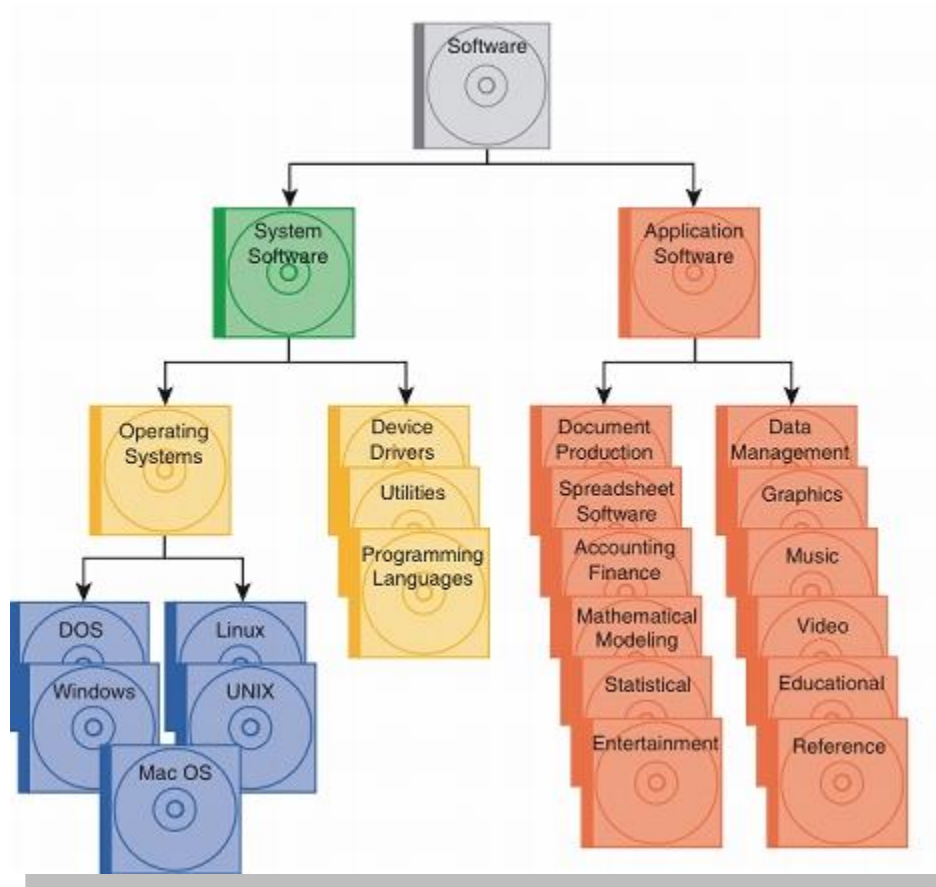
Operating Systems and Utilities

- Operating System Overview
- Windows, Mac OS, UNIX, Linux, and DOS
- Handheld and Tablet Operating Systems
- Utilities

Operating System Overview

- The operating system (OS) acts as the master controller for all activities
  - Resources are required components to perform work

FIGURE 3-10

A command to print a document is relayed through various levels of software, including the operating system, until it reaches the printer.

2. The word processing application signals the operating system that a document must be sent to the printer.

Printer Driver

4. The device driver controls the printer as it prints the document.

1. You issue the Print command while using application software, such as a word processor.

3. The operating system communicates the document data to the device driver for the printer.
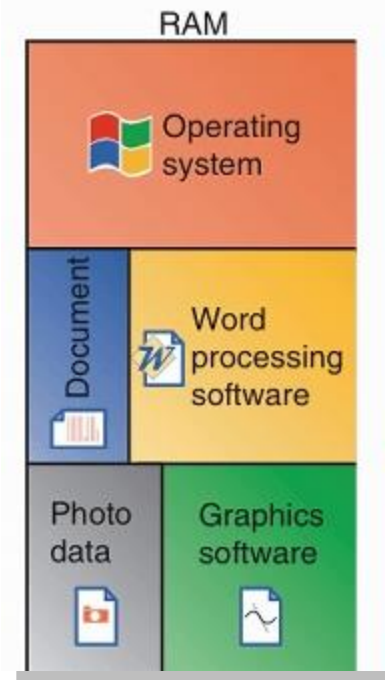
Operating System Overview

- Operating system tasks include
  - Managing processor resources
  - Managing memory
  - Keeping track of storage resources
  - Ensuring that input and output proceed in an orderly manner
  - Establishing basic elements of the user interface

Operating System Overview

- A computer can take advantage of performance-enhancing technologies
  - Multitasking
  - Multithreading
  - Multiprocessing
- The OS allocates RAM when multiple programs run at once

Operating System Overview

- The OS keeps track of files and empty spaces on your storage medium
- The OS communicates with all connected peripheral devices
- User interfaces
  - Graphical
  - Command-line

Operating System Overview

- The bootstrap program is stored in ROM and supplies the instructions to load the OS

- The kernel provides the most essential operating system services

  - Memory management
  - File access

Operating System Overview

- Interacting with the OS
  - Launch programs
  - Manage files
  - Get help
  - Customize the user interface
 - Configure equipment

Operating System Overview

- One OS might be better suited to some computing tasks than others
  - Single-user operating system
  - Multiuser operating system
  - Network operating system
  - Desktop operating system

Windows, Mac OS, UNIX, Linux, and DOS

- Microsoft Windows is the best-selling operating system
- Microsoft currently offers several types of operating systems
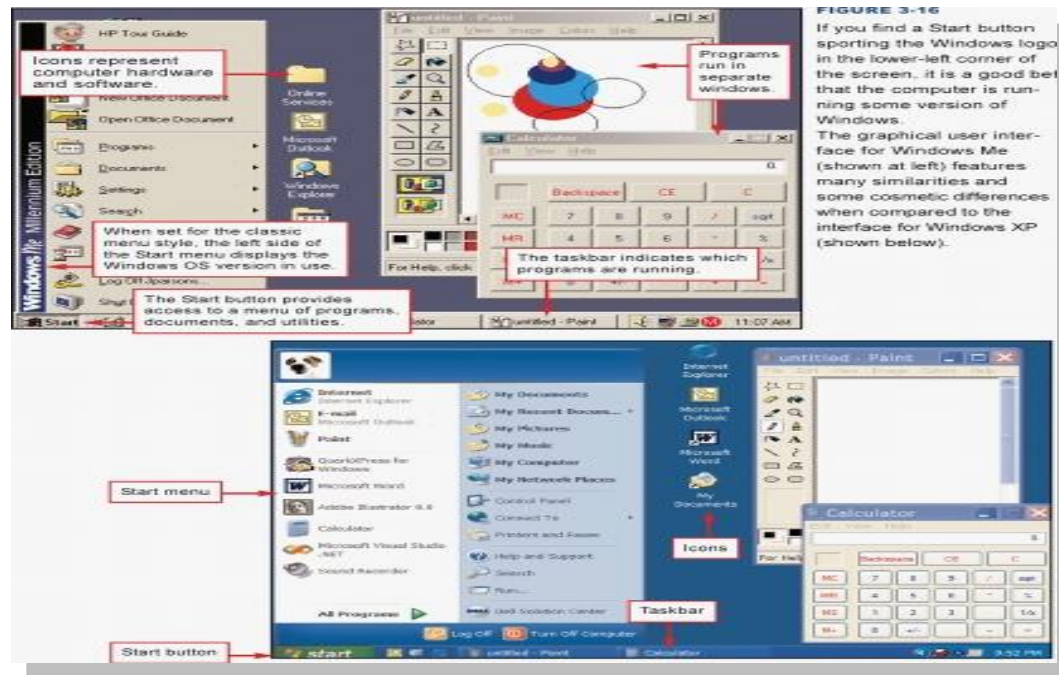
Windows, Mac OS, UNIX, Linux, and DOS

- Mac OS, like Windows, bases their user interface on the graphical model pioneered at Xerox PARC
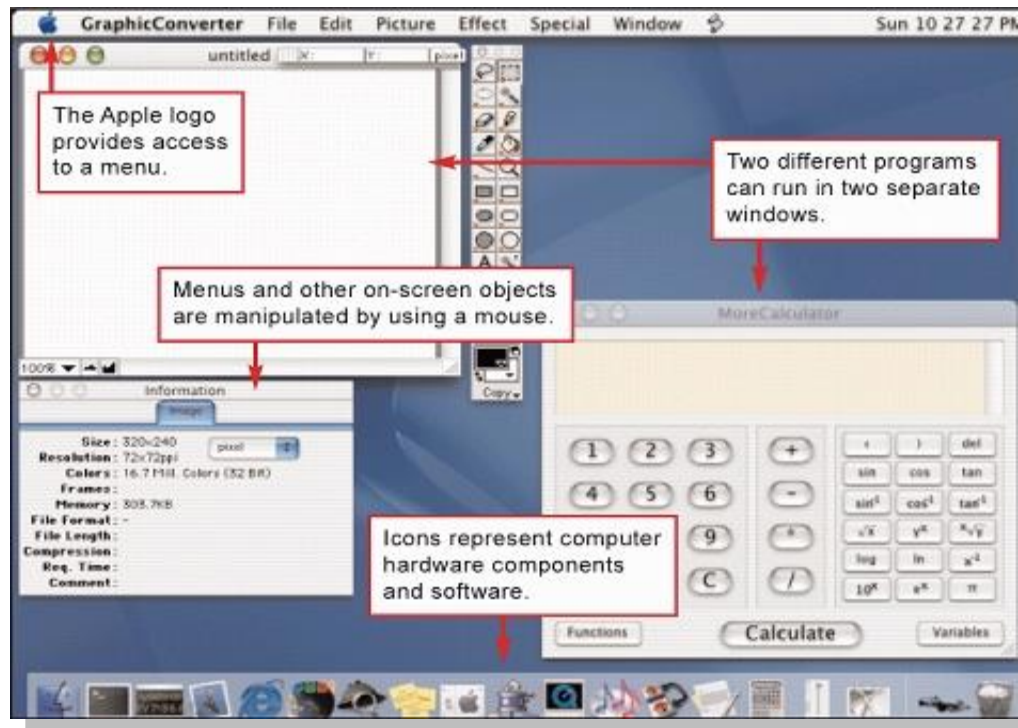
Windows, Mac OS, UNIX, Linux, and DOS

- UNIX was developed in 1969, and is very dependable
  - Foundation for Apple's Mac OS X Tiger
- Linux is loosely based on a UNIX derivative
  - Distributed under the terms of a General Public License
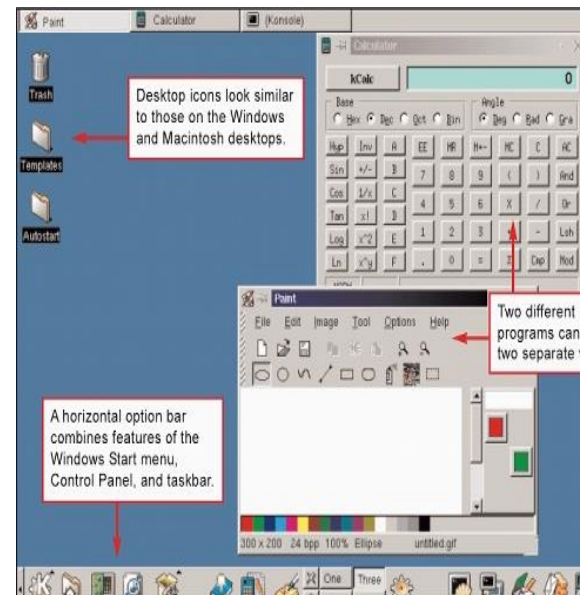
FIGURE 3-19 Linux users can choose from several graphical interfaces. Pictured here is the popular KDE graphical desktop.

Desktop icons look similar to those on the Windows and Macintosh desktops.

Two different programs can run in two separate windows.

A horizontal option bar combines features of the Windows Start menu, Control Panel, and taskbar.

Windows, Mac OS, UNIX, Linux, and DOS

- Microsoft introduced DOS (Disk Management System) in 1982
  - Marketed under MS-DOS
- Provided part of the operating system kernel for Windows versions 3.1, 95, 98, and Me
- DOS offers handy troubleshooting utilities
  - Ping, tracert, copy *, msconfig, and netstat

Handheld and Tablet Operating Systems

- Three operating systems dominate the realm of handheld computers

  - Palm OS

  - Windows Mobile OS

  - Symbian OS

  - Android

  - IOS

- Handheld operating systems are simpler and are stored in ROM

Utilities

- Utility software is designed to perform a specialized task
  - System software
  - Third-party utilities
    - WinZip
    - WSFTP
    - Norton AntiVirus and McAfee VirusScan
    - PGP
    - NetNanny
    - Adobe Acrobat Reader
  - Can be purchased in a store or online

Application Software

- Document Production Software

- Spreadsheet Software

- "Number Crunching" Software

- Database Software

- Graphics Software

- Music Software

Application Software

- Video Editing and DVD Authoring Software
- Software Suites
- Educational and Reference Software
- Entertainment Software
- Business Software

Document Production Software

- Assists you with composing, editing, designing, printing, and electronically publishing documents
  - Word processing
  - Desktop publishing
  - Web authoring

Document Production Software

- Document production software may include:
  - Spelling checker
    - Spelling dictionary
  - Thesaurus
  - Grammar checker
  - Feature to analyze the reading level
    - Readability formula
  - Search and Replace feature

Document Production Software

- The format for a document refers to the way that all elements are arranged on the page

Times New Roman Font	8 pt.
Times New Roman Font	10 pt.
Times New Roman Font	12 pt.
Times New Roman Font	16 pt.
Times New Roman Font	**16 pt. Bold**
Times New Roman Font	16 pt. Green
Arial Font	16 pt.
Comic Sans MS	16 pt.
Georgia Font	**16 pt. Bold Gold**
Dotto	24 pt. Orange

Document Production Software

- Mail merge automatically creates personalized letters by combining the information in a mailing list with a form letter

- Additional capabilities of word processing software include:

  - Automatically generating table of contents and index
  - Numbering and positioning footnotes
  - Providing document templates
  - Export to HTML format

Spreadsheet Software

- A spreadsheet uses rows and columns of numbers to create a model or representation of a real solution

- Spreadsheet software, such as Microsoft Excel, provides tools for creating worksheets

Spreadsheet Software

When a cell contains a formula, it displays the result of the formula rather than the formula itself. To view and edit the formula, you use the Formula bar.

You can think of the formula as working "behind the scenes" to perform calculations and then display the result.

Spreadsheet Software

- A formula tells the computer how to use the contents of cells in calculations
  - Cell references
    - Relative reference
    - Absolute reference
  - Mathematical operators
  - Functions
  - Automatic recalculations
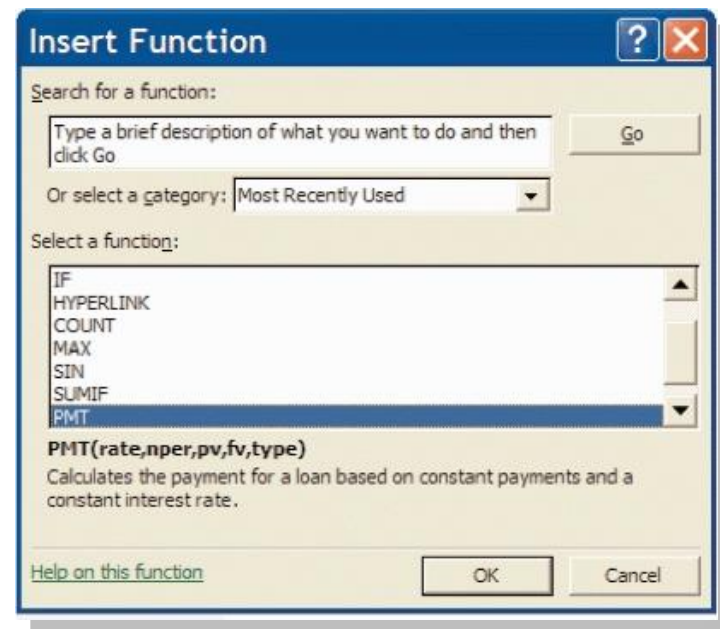
"Number Crunching" Software

- Provides a structured environment dedicated to a particular number crunching task
  - Statistical software
  - Mathematical modeling software
  - Money management software
    - Personal finance software
  - Tax preparation software
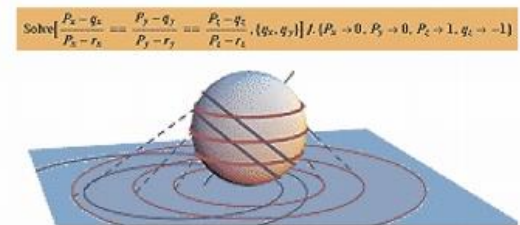
Database Software

- A database is a collection of data
  - Database software helps you find, organize, update, and report information stored in a database

FIGURE 3-33
A single database record is similar to a Rolodex card or an index card. A series of records is usually depicted in table format.
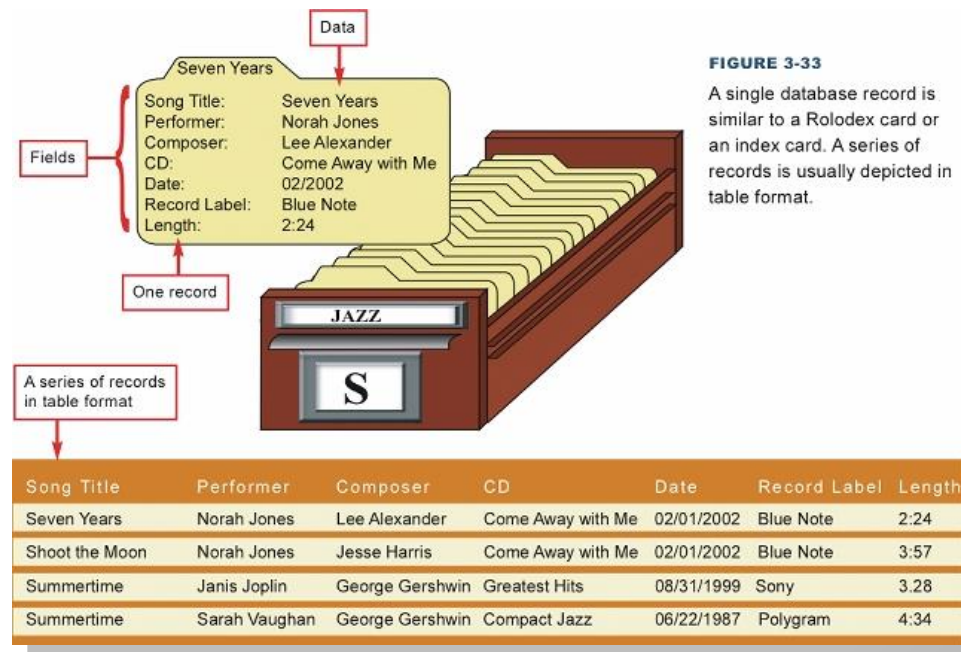
Database Software

- A query language such as SQL (Structured Query Language) provides a set of commands for locating and manipulating data
  - Natural language query
  - Query by example
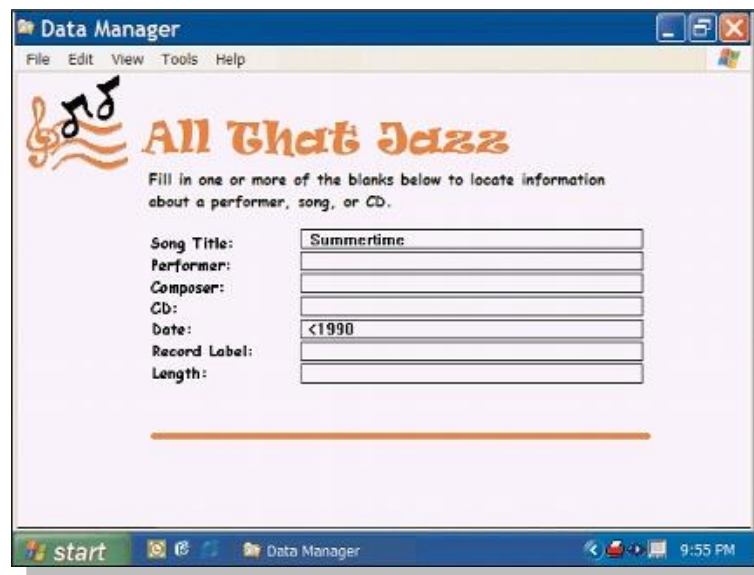
Graphics Software

- Designed to help you create, manipulate, and print graphics
  - Paint software
  - Photo editing software
  - Drawing software
  - 3-D graphics software
  - CAD software
  - Presentation software
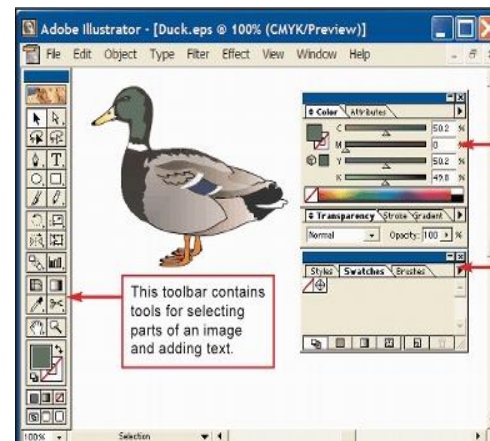
FIGURE 3-37

Drawing software provides tools for creating and manipulating graphics.

This toolbar allows artists to select colors and shading.

This toolbar allows artists to select brush sizes and styles.

This toolbar contains tools for selecting parts of an image and adding text.

Music Software

- Allows you to make your own digital voice and music recordings
    - Audio editing software
    - CD ripper software
    - Audio encoding software
    - Ear training software
    - Notation software
    - Computer-aided music software
    - MIDI sequencing software

Video Editing and DVD Authoring Software

- Provides a set of tools for
  - Transferring video footage from a camcorder to a computer
  - Clipping out unwanted footage
  - Assembling video segments
  - Adding special visual effects
  - Adding a sound track

FIGURE 3-41

Use the timeline to indicate the sequence for your video clips and transitions.

Add transitions between clips.

Arrange the audio tracks to synchronize with each video clip.
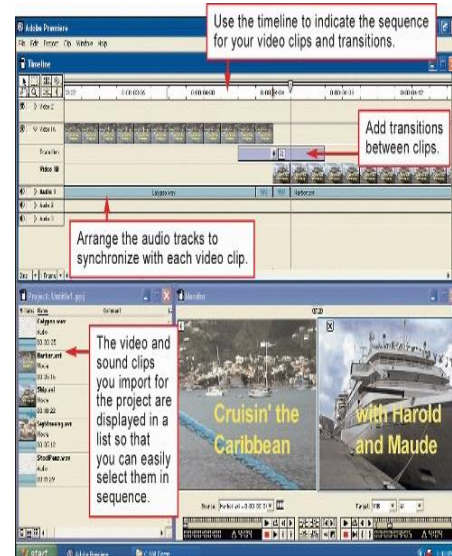
Video editing software, such as Adobe Premiere, helps you import a series of video clips from a camera or VCR, arrange the clips in the order of your choice, add transitions between clips, and add an audio track.

The video and sound clips you import for the project are displayed in a list so that you can easily select them in sequence.

Cruisin' the Caribbean with Harold and Maude

Preview your video to see how the clips, transitions, and soundtrack all work together.

Software Suites

- Collection of application software sold as a single package
    - Less expensive to purchase a software suite than applications individually

Microsoft Office XP Professional	Norton SystemWorks	Adobe Creative Suite	InterVideo MediaOne
Word	Norton AntiVirus	Adobe Illustrator	WinDVD
Excel	Norton Utilities	Adobe Photoshop	Disc Master
Outlook	Norton Goback	Adobe InDesign	Smart Backup
PowerPoint	Norton Cleanup	Adobe Acrobat	InterVideo Photo Album
Publisher	Norton Checkit	Professional	DVD Copy
Access	Diagnostics	Adobe	
	Norton System	GoLive	
	Optimizer		

Educational and Reference Software

- Educational software
  - Helps you learn and practice new skills
- Reference software
  - Provides a collection of information and a way to access that information
  - Generally shipped on CD or DVD, or accessed on the Web

Entertainment Software

- Computer games are the most popular type of entertainment software
  - Role-playing
  - Action
  - Adventure
  - Puzzle
  - Simulation
  - Sports
  - Strategy

Business Software

- Vertical market software is designed to automate specialized tasks in a specific market or business

- Horizontal market software is generic software that just about any type of business can use

  - Payroll software

  - Accounting software

  - Project management software

  - Groupware

Buying and Installing Software

- Buying Software
- Installation Basics
- Installing from Distribution Media
- Installing Downloaded Software
- Software Updates
- Uninstalling Software
- Software Copyrights and Licenses

Buying Software

- Available in many types of stores

- Software contained on distribution media

- Make sure your computer meets the system requirements

System Requirements

Operating Systems: Windows 95/98/2000/Me/XP/Vista
Processor: Pentium class computer
Memory: 16 MB or more
Hard Disk Space: 10 MB free
Network Protocol: TCP/IP
Network Connection: 10/100 Ethernet LAN/WAN,
cable modem, DSL router, ISDN router, or dial-up modem

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Installation Basics

- Installing software places the files in appropriate folders on your hard disk

- Installing from Distribution Media

- Installing Downloaded Software

Software Updates

- Software publishers regularly update their software
  - Add new features
  - Fix bugs
  - Update security
- Software patches replace part of the software you currently have installed
- Service packs correct problems and address security vulnerabilities, usually in operating systems

Software Updates

- Updates are usually available online for registered software
- Always install patches and service packs when they become available
- Many software publishers require users to type in a validation code to complete the installation

Uninstalling Software

- Uninstall routines delete the software's files from the various folders on your computer's hard disk
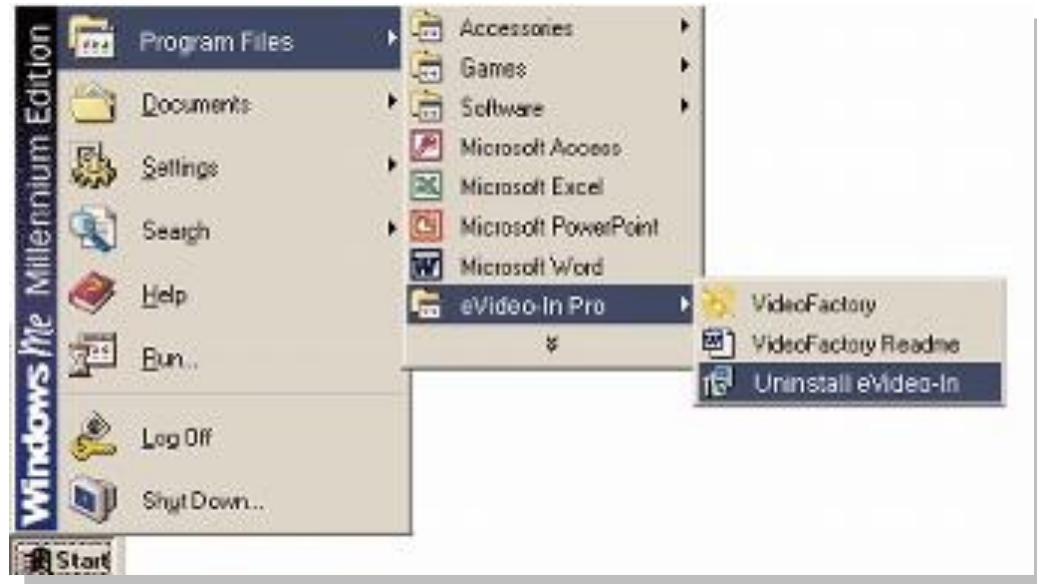
Software Copyrights and Licenses

- A copyright is a form of legal protection that grants the author of an original "work" exclusive rights
  - Copyright notice
- Software licenses define the ways in which you may use a computer program
  - Single-user
  - Site
  - Multiple-user
  - Concurrent
  - Shrink-wrap

Software Copyrights and Licenses

- A EULA (end-user license agreement) is displayed on-screen when you first install software
- Different types of software licenses
  - Commercial software
  - Shareware
  - Freeware
  - Open source
  - Public domain