

16<sup>th</sup> Edition

# Understanding Computers

Today and Tomorrow

Comprehensive

## Chapter 6

# Application Software: Desktop and Mobile Apps

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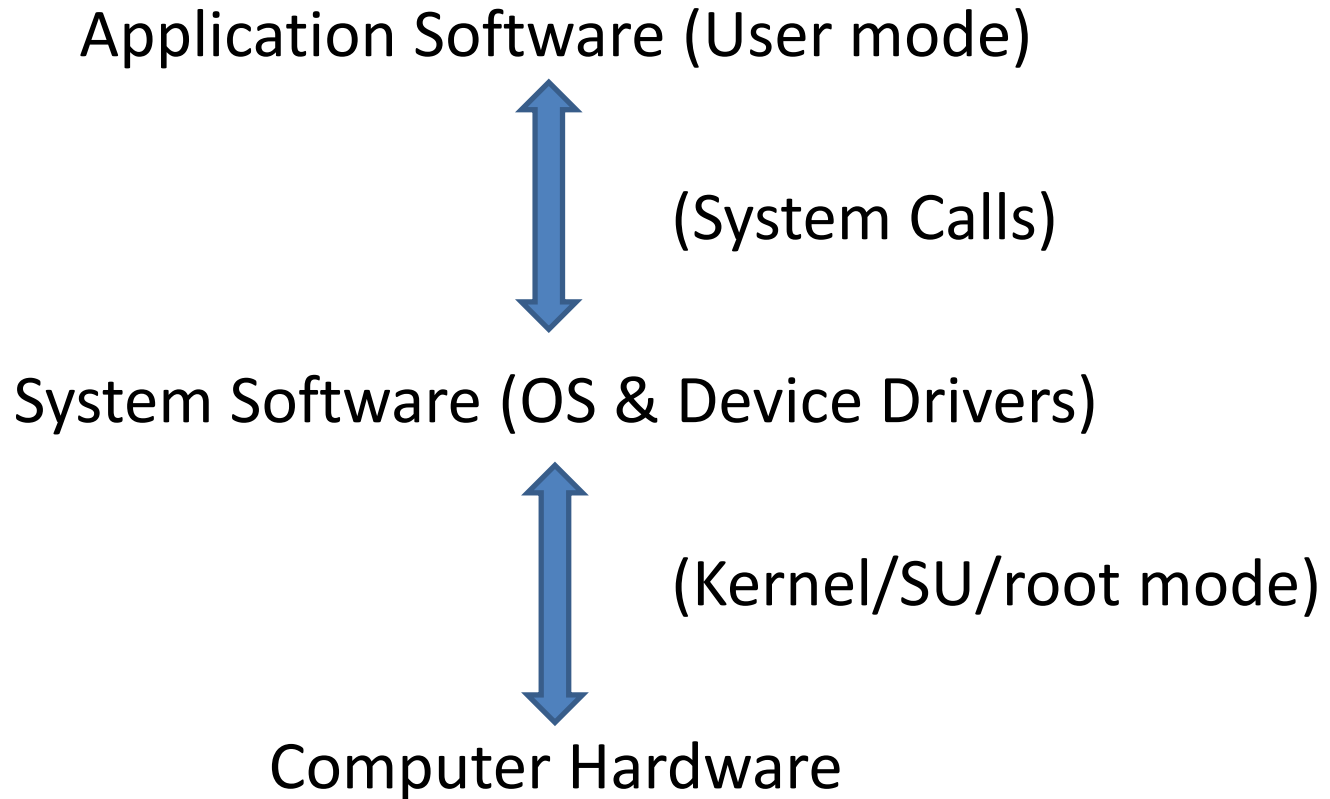
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# Business-IT-Society

- Business Considerations
  - Return on Investment - ROI
  - Total Cost of Ownership – TCO
  - Efficiency -> doing things optimally
  - Effectiveness -> doing right thing and achieving goals
- Societal Considerations
  - Open Source
  - DRM (digital rights management)
  - Location services & privacy
  - Etc.
- Ethics
  - Responsibility
  - Stockholder vs Stakeholder vs Social Contract

# Software Stack





# Application Software Categories

- Vertical Software
  - Useful for specific industry
  - Airline reservation system
- Horizontal Software
  - Broad utility
  - MS Word, Excel, etc.



# The Basics of Application Software

- Software ownership rights of **application software (apps)**
  - Specify the allowable use of the program
  - A **software license** gives you the right to use a software program
    - Specifies the conditions under which the software can be used
    - Also called an end user license agreement (EULA)
    - Often terms of use instead for mobile apps
    - More complex due to Virtual Desktops




# Software Licensing Types

- Commercial Software (e.g. MS Office, Adobe)
- Shareware (e.g. Winzip)
  - Proprietary software initially provided free of charge
  - Often urged to make donation
- Freeware (e.g. Chrome, VLC Media)
  - Free to use and keep
- Public Domain
  - no legal, copyright or editing restrictions
- Open Source
  - Free to modify
- Software Subscription (\* added by JGL)
  - New model



# Commercial Software

- **Commercial software** is developed and sold for profit
  - Typically comes with a single-user license
    - Sometimes can be installed on one desktop and one personal computer (see license to know)
    - Site licenses or network licenses are available for some software
  - Some software is available in a demo or trial version to test out the program before buying
  - Licenses may be per running instance or use license tokens to better fit some business uses



# Shareware, Freeware, and Public Domain Software

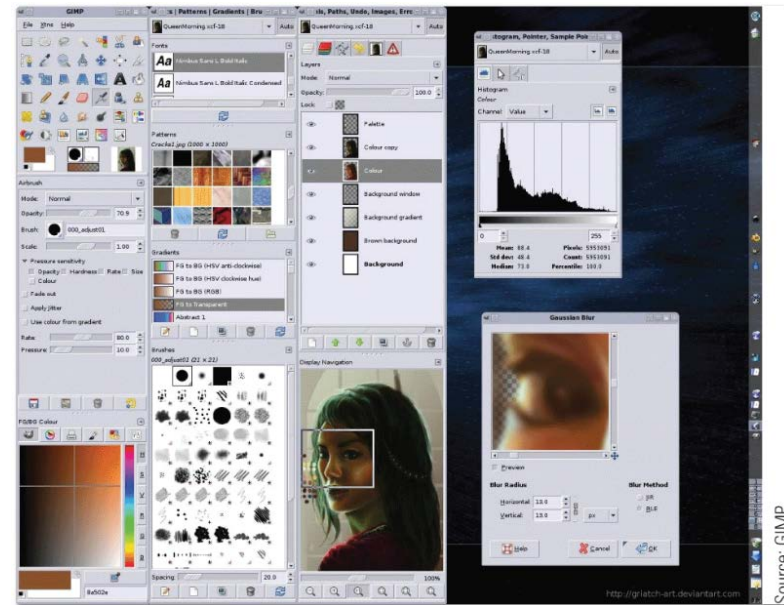
- **Shareware** consists of copyrighted software distributed on the honor system
  - Consumers should either pay for it or uninstall it after the trial period
- **Freeware** consists of copyrighted software programs that are given away by the author for others to use free of charge
  - Many apps available at the app stores used with mobile devices are freeware
- **Public domain software** is not copyrighted
  - Ownership rights have been donated to the public domain (i.e. no copyright)



# Inside the Industry

**Open Source Software** are programs with source code made available to the general public

- Linux was the first widely used open source software
- There are many other open source apps (GIMP, LibreOffice, etc.)
- Cheaper than other software
- Increased stability and security
- Ability to modify application's source code



The free GIMP program.

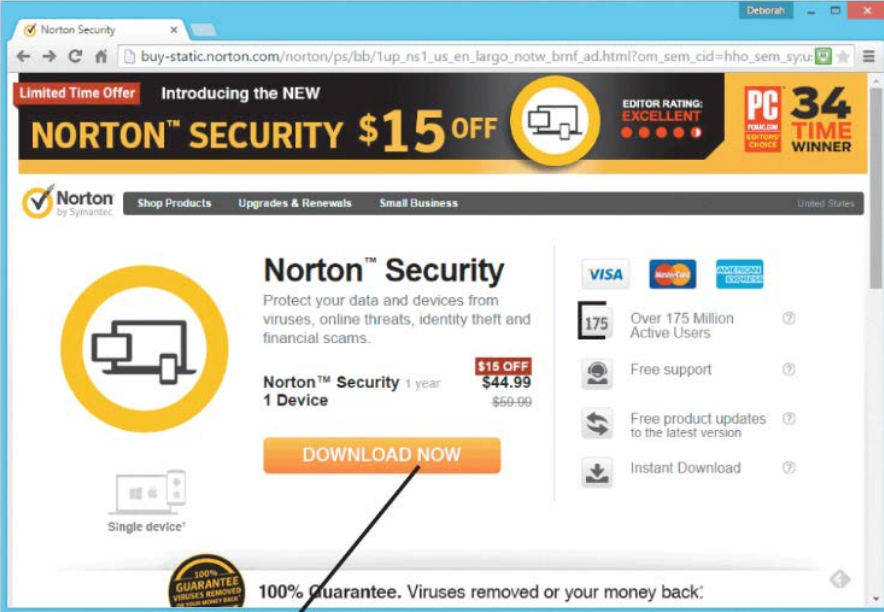


# Software Subscription

- Software Subscription Emerging Model
  - Based on running instances
  - Recurring fees
  - What to do about thin-client/VDI

# Installed vs. Cloud Software: Installed Software

- **Installed software** must be installed on the computer before it can be run
  - Can be purchased in physical form (DVD, etc.) and then installed
  - Can be downloaded from the Internet and then installed
  - Can be free or fee-based software



Source: Norton by Symantec

Once purchased, the installation program will be downloaded to the buyer's computer.

**FIGURE 6-6**

**Installed software.**

Is often purchased via the Internet.



# Cloud Software

- **Cloud software** is delivered on-demand via the Web
  - Also called Software as a Service (SaaS), Web-based software, and cloudware
  - Includes free software and fee-based software
  - Advantages of cloud software
    - Files can be accessed from any computer or device with an Internet connection
    - Ease of implementation
    - Improved collaboration and interface capabilities
    - Always working with the most current version of software



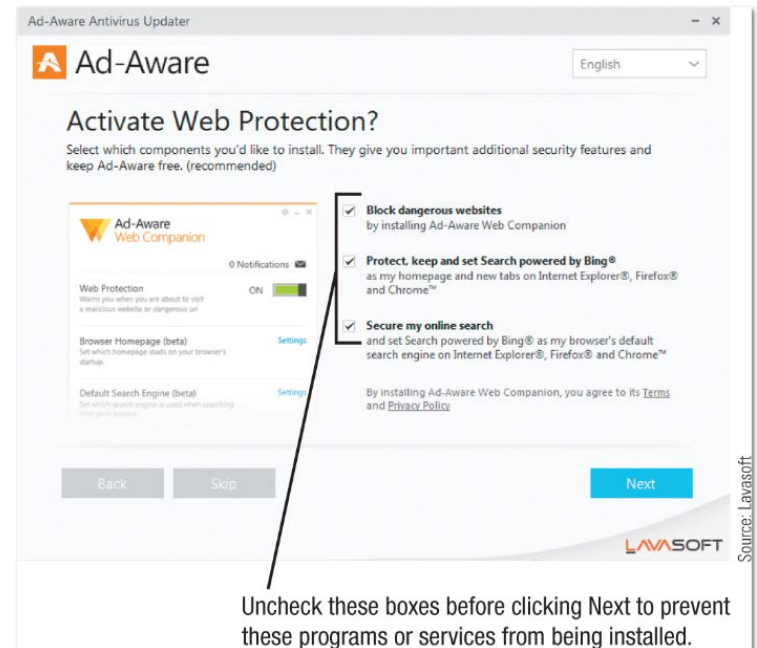
# Cloud Software (cont'd)

- Potential disadvantages of cloud software
  - Online applications tend to run more slowly
  - Cannot use during a server outage or without Internet access
    - Some programs like Google Docs allow some offline access
  - Some cloud software may have file size limits
  - Cost may eventually exceed the cost of purchasing a similar installed version of the software

# Trend

## Dealing with Crapware

- Many manufacturers preinstall third-party software on new PCs
  - Can also be bundled with a software program you download
- Download software from the manufacturer's site whenever possible
- Read each installation screen carefully
- Security software can detect PUPs (potentially unwanted programs)



Pay close attention to the options listed on installation screens to avoid installing crapware.











# Software Suites

- A **software suite** is a collection of software programs bundled together and sold as a single software package
  - Office suites are used by most businesses/individuals to produce documents and typically include:
    - Word processing software
    - Spreadsheet software
    - Database software
    - Presentation graphics-software
      - **Microsoft Office** 2016/19 and Office 365
  - Provide a common interface among programs in the suite
  - Typically less expensive than buying the programs individually
- Note Mac OSX forces consistent interface across applications to some extent

# Common Software Commands

- Commands are similar from program to program
- Usually commands are issued via menus, keyboard shortcuts, or command buttons located on a toolbar or Ribbon
- **Keyboard shortcut** key combinations are faster ways of issuing commands
- \*Mac use CMD instead of CTRL

COMMAND	COMMAND BUTTON	KEYBOARD SHORTCUT	DESCRIPTION
Open		[Ctrl]+[O]	Opens a dialog box so you can choose a saved document to open from a storage medium so it can be edited or printed.
Save		[Ctrl]+[S]	Saves the current version of the document to a storage medium.
Print		[Ctrl]+[P]	Prints the current version of the document onto paper.
Cut		[Ctrl]+[X]	Moves the selected item to the Clipboard.
Copy		[Ctrl]+[C]	Copies the selected item to the Clipboard.
Paste		[Ctrl]+[V]	Pastes the last item copied or cut to the Clipboard to the current location.
Undo		[Ctrl]+[Z]	Undoes the last change to the document.
Close		[Alt]+[F4]	Closes the document. Any changes made to the document are lost if the document wasn't saved first.

**FIGURE 6-9**  
Common application software commands.





# Word Processing Concepts

- **Word processing** uses a computer and **word processing software** to create, edit, save, and print written documents
  - Letters, contracts, manuscripts, etc.
- Common word processing software programs
  - Microsoft Word
  - Corel WordPerfect
  - Google Docs
  - Apple Pages

# Formatting a Document

- **Formatting** changes the appearance of the document
  - Font face, font size, font style, and/or font color
  - Line spacing or margins
  - Page numbers
  - Shading or borders to a paragraph, image or other item

This is 10-point Arial.

This is 12-point Times New Roman.

*This is 16-point Lucida Handwriting.*

This is 20-point Calibri.

***This 16-point Calibri text is bold and italic.***

**This 16-point Calibri text is red and underlined.**

## **FIGURE 6-11**

**Fonts.** The font face, size, style, and color used with text can be specified in many application programs.



# Creating a Word Processing Document

- **Word wrap** automatically returns the insertion point to the next line when the end of the screen line is reached
- Character formatting (font face, size, style, or color)
- Paragraph formatting (line spacing, indentation, alignment, and styles)
- Page formatting (margins, paper size, orientation, headers, footers, etc.)
- Document formatting (footnotes, end notes, table of contents, index, background, theme)



# Spreadsheet Concepts

- A **spreadsheet** contains a group of numbers and other data organized into rows and columns
  - **Spreadsheet software** is used to create computerized spreadsheets
  - Most widely used spreadsheet programs:
    - Microsoft Excel
    - Corel Quattro Pro
    - Google Sheets
    - Apple Numbers



# Creating a Spreadsheet

- A **worksheet** is a single spreadsheet divided into rows and columns
- A **workbook** is a collection of worksheets saved in a single file
- A **cell** is the intersection of a **row** and a **column**
  - Each cell is identified by a cell address, such as A1
  - Cell pointer is used to select a cell
  - Cell pointer can be used to select more than one cell (range or block)

# Entering Data into a Spreadsheet Cell

- Data is entered into the appropriate spreadsheet cell
- **Labels** are text-based entries that identify data on the worksheet
- **Constant values** are numerical entries
- **Formulas** perform mathematical operations on the content of other cells
  - Usually reference the cell address, not the current data in a cell
  - Use mathematical operators; begin with an = sign

SYMBOL	OPERATION
+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponentiation

**FIGURE 6-16**  
Universal  
mathematical  
operators.



# Spreadsheet Functions

- A **function** is a named, pre-programmed formula
  - Hundreds of functions that can be used in spreadsheets

EXAMPLES OF FUNCTIONS	
=SUM(range)	Calculates the sum of all values in a range.
=MAX(range)	Finds the highest value in a range.
=MIN(range)	Finds the lowest value in a range.
=AVERAGE(range)	Calculates the average of values in a range.
=PMT(rate, number of payments, loan amount)	Calculates the periodic payment for a loan.
=IF(conditional expression, value if true, value if false)	Supplies the values to be displayed if the conditional expression is true or if it is false.
=NOW( )	Inserts the current date and time.

**FIGURE 6-17**  
Common spreadsheet functions.



# Absolute vs. Relative Cell Referencing in Formulas

- Relative cell references
  - Cell addresses are adjusted as the formula is copied to reflect the new location of the formula
- Absolute cell references
  - Formulas are copied exactly as they are written
  - Appropriate when you want to use a specific cell address in all copies of the formula
  - Use \$ to make cell references absolute: \$B\$6
- A single formula can contain both relative and absolute cell references as needed



# Examples of Relative and Absolute Cell Referencing

## COPYING WITH RELATIVE CELL REFERENCES

In most formulas, cell addresses are relative and will be adjusted as the formula is copied.

	A	B	C	D	E
1		Cones	Sundaes	Total	
2	April	600	200	800	
3	May	800	500	1300	
4	June	1500	600	2100	
5	Total			4200	
6					

Formula in cell D2: `=B2+C2`

Results when the formula in cell D2 is copied to cells D3 and D4.

Formula in cell D4 is `=B4+C4`.

## COPYING WITH ABSOLUTE CELL REFERENCES

A dollar sign (\$) marks a cell reference as absolute; it will be copied exactly as it appears in the source cell.

	A	B	C	D	E
1		Cones	Sundaes	Total	
2	April	600	200	800	
3	May	800	500	800	
4	June	1500	600	800	
5	Total			2400	
6					

Formula in cell D2: `=$B$2+$C$2`

Results when the formula in cell D2 is copied to cells D3 and D4.

## IMPROPER USE

Formula in cell D4 is `=$B$2+$C$2`.

	A	B	C	D	E
1		Cones	Sundaes	Total	Percent
2	April	600	200	800	19.05%
3	May	800	500	1300	30.95%
4	June	1500	600	2100	50.00%
5	Total			4200	100.00%
6					

Formula in cell E2: `=D2/$D$5`

Results when the formula in cell E2 is copied to cells E3 and E4.

## PROPER USE

Formula in cell E4 is `=D4/$D$5`.

**FIGURE 6-18**

Relative vs. absolute cell referencing.



# Charts and What-If Analysis

- Most spreadsheet programs include some type of charting or graphing capability
  - Can create charts from the data in the spreadsheet (do not have to reenter it)
- Charts change accordingly if the data in the spreadsheet changes
- When cell contents are changed, formulas are automatically recalculated
- What-if-analysis
  - Tool frequently used to help make business decisions



# Database Concepts

- A **database** is a collection of related data that is stored in a manner enabling information to be retrieved as needed
  - Database management system (DBMS) or **database software** allows the creation and manipulation of an electronic database
  - Most widely used relational database programs
    - Microsoft Access
    - Corel Paradox
    - Oracle Database
    - IBM's DB2



# Database Organization

- Data in a database is organized into fields (columns), records (rows), and tables
  - A **field (column)** is a single type of data to be stored in a database
  - A **record (row)** is a collection of related fields
  - A **table** is a collection of related records
  - Database file is a collection of related tables



# Creating a Database

- Create the database file first
  - Contains objects, such as tables, forms, and queries
- Create one or more tables
  - Can use either the table's Datasheet view or Design view
  - The table structure is created:
    - Field name (unique identifying name)
    - Data type (text, number, date, object)
    - Field size (maximum number of characters)
    - Default value (initial content of the field)
  - Data is entered into the table
  - A form can be create to use for data entry if desired

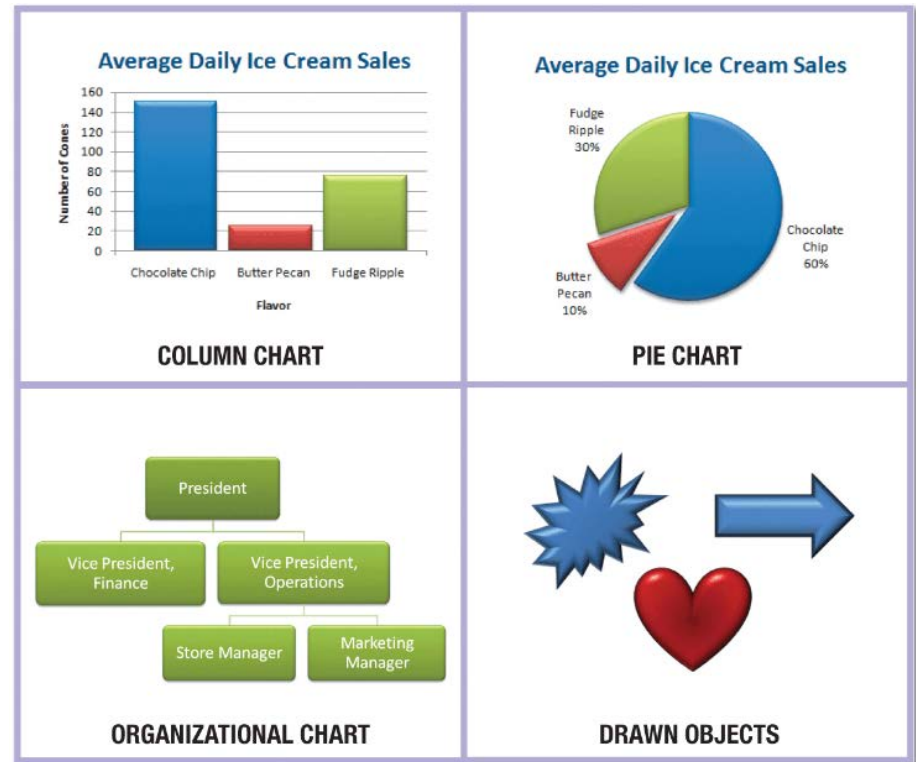


# Queries and Reports

- A query is a question, or a request for specific information from the database
  - Contains criteria to specify the records and fields to be included in the query results
  - Named and saved so it can be run again at a later time
  - Displays the current data meeting the criteria each time it is opened
- A report is created when a more formal output is desired
  - Associated with either a table or a query
  - Displays the current data in the report format each time it is opened

# Presentation Graphics Concepts

- A **presentation graphic** is an image designed to visually enhance a presentation
  - Can be used in electronic slide shows
  - Can be inserted into reports and other written documents



**FIGURE 6-24**  
Examples of  
presentation  
graphics.



# Presentation Graphics Terms

- An electronic **slide** is a one-page presentation graphic that can contain images, text, video, and more
- An **electronic slide show** is a group of electronic slides that are displayed one after the other on a computer monitor or other display device
- **Presentation graphics software** is used to create presentation graphics
  - Microsoft PowerPoint
  - Corel Presentations
  - Google Slides
  - Apple Keynote





# Finishing a Presentation

- Objects can be animated
- Transitions between slides can be added
- Slide Sorter view can be used to rearrange the slide order
- Show can be set up to run automatically or manually
- Can print slides to create overhead transparencies or an audience handout
- Speaker tools include:
  - Speaker notes and pens
  - Presenter view



# Graphics and Multimedia Concepts

- **Graphics** are digital representations of images, such as digital photographs, clip art, scanned drawings, and original images created using a software program
- **Multimedia** technically refers to any application that contains more than one type of media
  - Often used to refer to audio or video content
- There is a large variety of **graphics software** to create or modify graphics, edit digital audio or video, play multimedia files, and burn CDs and DVDs



# Types of Graphics Software

- Painting programs typically create bitmap images
  - Don't usually support layers
  - Microsoft Paint
- Drawing programs (illustration programs) typically create vector graphics using mathematical formulas
  - Adobe Illustrator CC, Corel Painter
- Image editing or photo editing programs are designed for touching up or modifying images
  - Adobe Photoshop, Picasa, Apple Photos

# Audio Capture and Editing Software

- Audio editing software is used to create and edit audio files
  - Sound recorder software captures sound from a microphone
  - Ripping software captures sound from a CD
- Audio can be edited, spliced, and otherwise modified
- Professional and consumer software
  - Adobe Audition CC
  - Apple GarageBand
  - Audacity



**FIGURE 6-28**  
Audio editing software.



# Video Editing and DVD Authoring Software

- Video editing software modifies existing videos
  - Prepares video clips for presentations, Web sites, YouTube, etc.
  - Video is first imported into the computer
- DVD authoring software organizes content to be transferred to DVD
- DVD burning software records data on recordable or rewritable DVDs
- Professional and consumer software
  - Adobe Premiere Elements, Corel VideoStudio, Apple iMovie, etc.



# Media Players

- Media players are programs designed to play audio and video files
  - Music CDs, downloaded music, streaming audio, etc.
  - Video stored on device or streamed from the Internet
  - Typically allow you to arrange your stored music and videos into playlists
    - Transfer them to a CD or smartphone
    - Some players include the ability to purchase and download music via an associated music store
  - Important to adhere to copyright laws when using digital music



# Graphics, Multimedia, and the Web

- Often used by individuals and businesses to create content to be included on a Web sites or shared via the Web
  - Company logos
  - Web site banners
  - Games
  - Tutorials
  - Videos
  - Demonstrations
- Web multimedia content can be created using animation (Adobe Flash) and multimedia authoring (Adobe Director) software

# Remote Access Software

**FIGURE 6-34**

**Remote access software.** Allows you to use a computer from a remote Internet-enabled device.







# Summary

- The Basics of Application Software
- Word Processing Concepts
- Spreadsheet Concepts
- Database Concepts
- Presentation Graphics Content
- Graphics and Multimedia Concepts
- Other Types of Application Software