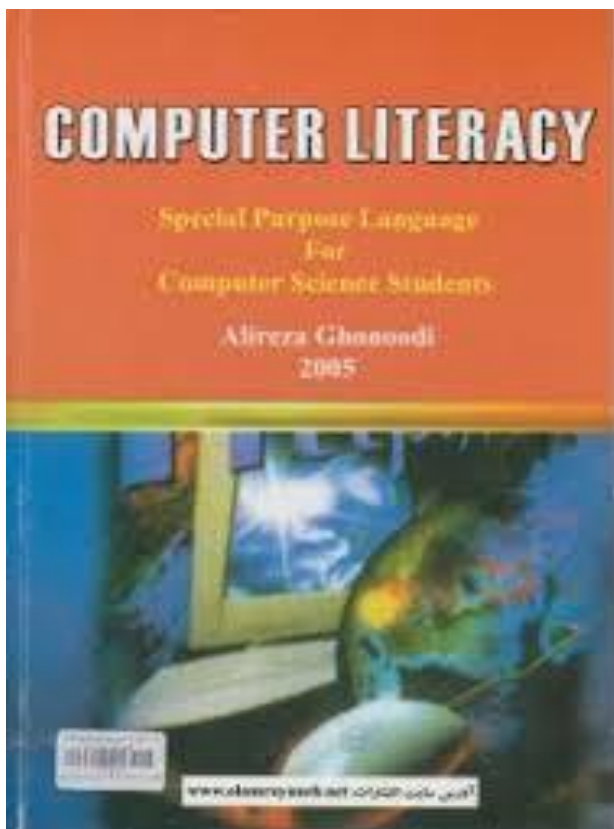




آموزشکده فنی و حرفه ای قدسیه ساری



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Unit 1: The Technology Revolution

1-1

OUR INFORMATION SOCIETY

In an **information society**, **knowledge workers** focus their energies on providing myriad information services. The knowledge worker's job function revolves around the use, manipulation, and dissemination of information. Learning about computers is an adventure that will last a lifetime because **information technology (IT)**, the integration of computing technology and information processing, is changing daily.

The computer revolution is transforming the way we communicate, do business, and learn. This technological revolution is having a profound impact on the business community and on our private and professional lives. For example, increasingly, we communicate with our colleagues at work through **electronic mail (e-mail)** or with our friends through **instant messaging (IM)** and **chat rooms**. Sometimes you may get unsolicited e-mail, called **spam**.

In this century we can anticipate traveling an **information superhighway**, a network of high-speed data communications links, that eventually will connect virtually every facet of our society. Today, millions of people have a **personal computer (PC)**. This widespread availability has resulted in an explosion of applications for computers. At home, people may connect to the **Internet**, a worldwide network of computers. Home appliances may also include **microprocessors**.

Through the 1970s, **users** related their information needs to computer professionals who would then work with the computer system to generate the necessary information. Today, users work directly with their PCs to obtain the information they need.

1-2

INFORMATION TECHNOLOGY COMPETENCY

Information technology competency (IT competency) is emerging as a universal goal in our information society. IT-competent people know how to purchase, set up, and operate a computer system, and how to make it work for them. The IT-competent person is also aware of the computer's impact on society and is conversant the language of technology.

Software refers collectively to a set of machine-readable Instructions, called **programs**, that cause the computer to perform desired functions. Computers and computer equipment, which accept **input** and provide **output**, are called **hardware**.

The fact that many people routinely use computers but are not IT-competent is inferred to as the "computer proficiency digital divide."

1-3

THE NET CONNECTION

We now live in a global village in which computers and people are linked within companies and between countries. Most existing computers are part of a **computer network** that shares resources and information.

The Internet links almost a billion users in a global network. **The Net** can be accessed by people in organizations with established links to the Internet and by Individuals with PCs, often via **Internet service providers (ISPs)**. Often this is done with a **modem**, a device that permits communication with remote computers via a telephone-line link. Commercial **information services**, such as **America Online (AOL)**, offer a wide range of information services, including up-to-the-minute news and weather, electronic shopping, e-mail, and much more. When the user terminates this **online** link, the user goes **offline**. Internet users can **download** text or a digitized version of a song directly to their PC, then read it or play it through their PC. **MP3 players** can store and play digital music recorded in MP3 format. Information is **uploaded** from a local computer to a remote computer. The **World Wide Web**, or **the Web**, is an Internet application that lets us view Internet **Web pages**. Another application, **newsgroups**, provides electronic bulletin boards. Generally, Internet applications can be placed into these categories: personal communications, browsing and searching for information, downloading and file sharing, streaming media, online transactions, and entertainment.

1-4

THE BASICS: HARDWARE, SOFTWARE, AND COMPUTER SYSTEMS

At the heart of any **computer** is its **processor**, an electronic device capable of interpreting and executing programmed commands for input, output, computation, and logic operations.

Output on a computer can be routed to a **monitor** or a **printer**. The output on a monitor is temporary and is called **soft copy**. Printers produce **hard copy** output. Data can be entered via a **keyboard** or a **mouse**, a **point-and-draw device**.

System software plays a central role in everything that happens within a computer system from start-up to shutdown. **Applications software** performs specific personal, business, or scientific processing tasks.

Random-access memory (RAM) provides temporary storage of data and programs during processing within solid-state **integrated circuits**, or **chips**. Permanently installed and interchangeable **magnetic disks** and **optical discs** provide permanent storage for data and programs. A computer system can include a variety of **peripheral devices**.

The differences in the various categories of computers are a matter of computing power, not its physical size. Today, computers are generally grouped in these categories: notebook PCs, desktop PCs, handheld computers, **thin clients**, workstations, **server computers**, and **supercomputers**. Server computers manage the resources on a network and perform a variety of functions for **client computers**. All **computer systems**, no matter how small or large, have the same fundamental capabilities—*input, processing, output, and storage*. Each offers many **input/output**, or **I/O**, alternatives.

1-5

PERSONAL COMPUTERS TO SUPERCOMPUTERS

In 1981, IBM introduced its **IBM PC**, defining the original PC-compatible machine, now also called a **Wintel PC** because of its use of Microsoft Windows **operating systems** and the Intel processors. The Apple iMac and Power Mac, with their Mac OS X and Motorola PowerPC processors, is the other major **platform**. Computers come in a variety of physical and computing sizes. Most personal computers are either **notebook PCs** (also called **laptops**) or **desktop PCs**. Many notebook PC buyers purchase a **port replicator**, called a **docking station**, for portability plus the expanded features of a desktop PC. **Ports** are electronic interfaces through which devices like the keyboard, monitor, mouse, printer, image scanner, and so on are connected. The desktop PC's **system unit** contains the processor, disk storage, and other components. Many mobile workers are benefiting from using a **wearable PC**.

The typical off-the-shelf PC is configured to run multimedia applications. **Multimedia applications** combine text, sound, graphics, motion video, and/or animation. The typical multimedia-configured PC includes a **motherboard**; a keyboard and a point-and-draw device for input; a monitor and a printer for output; a **hard-disk drive** and a **floppy disk drive** into which an interchangeable **diskette**, or **floppy disk**, is inserted; a **CD-ROM drive** into which an interchangeable **CD-ROM** is inserted; a **DVD-ROM** drive that accepts all DVD format discs, such as **DVD-Video** for playing movies; and a microphone and a set of speakers for audio I/O. Some models have rewritable **CD-RW** and/or **DVD+RW**,

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Palmtop PC, personal digital assistant (PDA), connected organizer, personal communicator, mobile business center, and Web phone are just some of the names for **handheld computers**. A handheld can have a variety of physical shapes and sizes, referred to as its **form factor**. **Pen-based computers** which may or may not have small keyboards, make use of an electronic pen, call a **stylus**, to do such tasks as selecting options, entering data (via handwritten characters), and drawing. Keying can also be accomplished via an onscreen keyboard. **Speech-recognition** software, which allows the user to enter spoken words into the system, is being integrated into high-end handheld computer'. Handheld computers support a variety of **personal information management (PIM)** systems, including appointment scheduling and to-do lists. You may also be using handhelds to read a good **electronic-book (e-book)** via the computer's **text-to-speech software**.

The thin client computer is designed to function only when it is linked to a server computer.

The workstation's speed and input/output devices set it apart from a PC. A typical workstation will have a high-**resolution** monitor and a variety of specialized point-and-draw devices. A common use of workstations is for engineering design.

In **client/server computing**, processing is distributed throughout the network. The client computer requests processing or some other type of service from the server computer. Both client and server computers perform processing. The **proxy server computer** sits between the client and server, intercepting client requests to improve overall system performance. The client computer runs **front-end applications software**, and the server computer runs the **back-end applications software**.

Server computers are usually associated with **enterprise systems**; that is, computer-based systems that service entities throughout the company. Typically, users communicate with one or more server computers through a PC, a workstation, a thin client, or a **terminal**. Supercomputers primarily address **processor-bound applications**.

A computer system manipulates your **data** to produce **information**. The permanent source of data for a particular computer application area is sometimes called a **master file**.

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COMPUTER SYSTEM CAPABILITIES

A **local area network (LAN)** connects PCs or workstations in close proximity. The LAN's server computer performs a variety of functions for other client computers on the LAN.

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Computer system capabilities are either input/output or processing. Processing

capabilities are subdivided into computation and logic operations.

Computers perform input/output (I/O) operations by reading from input and storage devices and writing to output devices.

The computer is fast, accurate, consistent, and reliable, and aids in communications and has an enormous memory capacity. Computer operations are measured in **milliseconds**, **microseconds**, **nanoseconds**, and **picoseconds**. When downtime is unacceptable, companies provide **backup** computers that take over automatically should the main computers fail.

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HOW DO WE USE COMPUTERS?

Enterprise computing comprises all computing activities designed to support any type of organization: a company, a government entity, a university, and so on. Enterprise applications are in three groups: information systems, process/device control and science, research, and engineering.

- *Information systems.* The computer is used to process data and produce business information. Hardware, software, people, procedures, and data are combined to create an **information system**.
- *Process/Device Control.* In computer-based **process/device control**, processes accept data in a continuous **feedback loop**. **Industrial robots** perform many jobs from materials handling to painting without human intervention.
- *Science, research, and engineering.* The computer is used as a tool in experimentation, design, and development. **Computer-aided design (CAD)** involves using the computer in the design process.

The PC is used for **personal computing** by individuals for a variety of business and domestic applications, including such productivity tools as **word processing software**, **presentation software**, **spreadsheet software**, **database software**, **desktop publishing software**, **communications software**, including **Internet browsers**, and personal information management software. **Software suites** are bundles of complementary software that may include several or all of these common productivity software packages. A **spreadsheet** is a table of values, numbers, names, and so on. A **software portfolio** is the mix of software that you have on your computer.

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Matching

Match each item on the left to the corresponding item at right.

Modem	A. computation and logic operations
Industrial robots	B. size and shape
Text-to-speech	C. electronic pen
Newsgroups	D. music file
Hardware	E. programs
Software	F. interactive electronic bulletin boards
Peripheral devices	G. welding and painting
MP3	H. all patient records
Backup computers	I. telephone-line link
Stylus	J. reading e-books
1000 nanoseconds	K. computing equipment
Form factor	L. monitor and printer
Hard copy	M. take over when computers fail
Processing operations	N. 1 microsecond
Master file	O. printed output

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Self Checks

1. A person who uses a computer is called a:
 - a. user
 - b. software consumer
 - c. client
 - d. utilizer

2. Which of these is not a means of personal communication on the Internet:
 - a. electronic mail
 - b. instant messaging
 - c. chat
 - d. instanotes

3. Because of incompatible video formats, it is not yet possible to view DVD movies on a PC.
 - a. True
 - b. False

4. What causes computers to perform desired functions:
 - a. instruction lists
 - b. procedures
 - c. programs
 - d. soft copy

5. Data entered to a computer system for processing would be:
 - a. output
 - b. dataput
 - c. throughput
 - d. input

6. Unsolicited e-mail is known as:
 - a. bologna
 - b. RAM JAM
 - c. ham
 - d. spam

7. Uploading on the Internet is transmitting information from an Internet- based host computer to a local PC.
 - a. True
 - b. False

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8. The Internet is also known as:
 - a. The Bucket
 - b. the Global Interface
 - c. Cybernet
 - d. the Net
9. Individuals gain access to the Internet by subscribing to a(n):
 - a. ISP
 - b. IPS
 - c. PSI
 - d. SPI
10. Output on a monitor is soft copy and output on a printer is hard copy.
 - a. True
 - b. False
11. Of the different types of computers, only personal computers offer a variety of I/O alternatives.
 - a. True
 - b. False
12. Applications software takes control of a PC on start-up and then controls all system software activities during the computing session.
 - a. False
 - b. True
13. Integrated circuits are also called:
 - a. electronic sandwiches
 - b. slivers
 - c. chips
 - d. flakes
14. Thin clients are like PCs but with more features.
 - a. False
 - b. True
15. The four size categories of conventional personal computers are miniature, portable, notebook, and business.
 - a. True
 - b. False

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16. Server computers usually are associated with enterprise systems.
 - a. True
 - b. False

17. Supercomputers are oriented to what type of applications:
 - a. word processing
 - b. processor-bound
 - c. inventory management
 - d. I/O-bound

18. What is the name given those applications that combine text, sound, graphics, motion video, and/or animation:
 - a. videoscapes
 - b. multimedia
 - c. anigraphics
 - d. motionware

19. The trend in the design of computer networks is toward:
 - a. centralized mainframe computers
 - b. Client/server computing
 - c. distributed transmission
 - d. CANs

20. On a LAN, the client computer stores all data and applications software used by the server computer.
 - a. False
 - b. True

21. A microsecond is 1000 times longer than a nanosecond.
 - a. False
 - b. True

22. In a LAN, a server computer performs a variety of functions for its:
 - a. work units
 - b. LAN entity PC
 - c. subcomputers
 - d. client computers

23. An Internet-based online retailer is called a(n):

- a. cybertailer
- b. e-tailer
- c. online tailer
- d. net-tailer

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24. Supercomputers outperform humans when it comes to pattern recognition.
- False
 - True
25. Desktop publishing refers to the capability of producing camera-ready documents from the confines of a desktop.
- True
 - False
26. What type of computing comprises all computing activities designed to support an organization:
- Professional
 - Industrial
 - enterprise
 - Personal
- 27 . Computers that control processes accept data in a continuous:
- data traffic pattern
 - infinite loop
 - data highway
 - feedback loop
28. The PC productivity tool that manipulates data organized in rows and columns is called a:
- Spreadsheet
 - Presentation mechanism
 - database record manager
 - word processing document
29. The typical home PC is used 10 to 50 hours a week.
- True
 - False
30. Which PC productivity tool would be helpful in writing a term paper:
- word processing
 - Spreadsheet
 - Presentation
 - communications
31. Various programs within a given software suite have a common interface.
- True
 - False

Unit2: Software

2-1

THE OPERATING SYSTEM

The operating system and its **graphical user interface (GUI)** are the nucleus of all software activity. One of the operating system programs, called the **kernel**, loads other operating system and applications programs to RAM as they are needed. **Utility programs** are a type of system software. The linux-based **Windows OS** has file-level compatibility with many Windows-based applications.

All operating systems are designed with the same basic objectives in mind. Perhaps the most important objectives are to facilitate communication between the computer system and the people who run it and to optimize the use of computer system resources.

Operating systems get the most from their processors through **multitasking**— the concurrent execution of more than one program at a time. High-priority programs run in the **foreground** part of RAM and the rest run in the **background**.

Through the 1980s, the most popular microcomputer operating system, **MS- DOS**, was strictly *text-based, command-driven* software that required strict adherence to command **syntax**. The trend now is toward GUIs that use graphical **icons**. All modern operating systems have adopted the GUI concept.

A processor and an operating system define a platform, a standard for which software packages are developed. The modern PC/Windows platforms include PC-compatible computers with **Windows 95, Windows 98, Windows Me** (Millennium Edition), **Windows NT, Windows 2000, Windows XP**, or **Windows CE** (for handheld and pocket PCs). Windows XP, the client-side operating system, works with **Windows 2000 Server** or the newer **Windows .Net Server**, the server-side portion of the operating system to make client/server computing possible. Windows XP comes in two versions—**Windows XP Professional** and **Windows XP Home. Windows XP 64-Bit Edition** is designed for high-performance 64-bit workstations. Windows operating systems have many features, such as **plug-and-play** and **home networking**. Wintel platforms are *mostly* **backward compatible**.

The Apple family of microcomputers and **Mac OS X** define another major platform.

Linux, a spin-off of the popular **UNIX** operating system, is a popular operating system for a variety of computers. Linux is **open source software**.

System software, which includes the operating system and utility software, is applications-independent. Utility software is available to help you with disk and file maintenance, system recovery, security, backup, virus protection, and other system-related tasks.

Those companies that do not standardize on a platform must work to achieve **interoperability**, which refers to the ability to run software and exchange information in a **multiplatform environment**. Enabling technologies that allow communication and the sharing of resources between different platforms are called **cross-platform technologies**.

A wide variety of system software *utilities* can help with personal computing tasks, such as disk and file maintenance, system recovery, security, backup, and virus protection.

2-2

WINDOWS CONCEPTS AND TERMINOLOGY

The Windows *Help and Support* capabilities include step-by-step tutorials that lead you through numerous common procedures. The GUI-based Windows series runs one or more applications in **windows**—rectangular areas displayed on the screen.

Any software application that does not adhere to the Microsoft Windows standard is a **non-Windows application**. Programs that adhere to Windows conventions are **Windows applications**.

The Windows GUI relies on a point-and-draw device, such as a mouse, to click and **drag**.

The screen upon which icons, windows, and so on are displayed is known as the **desktop**. The **active window** displays the application being currently used by the user. **Inactive windows** display applications that are running but not being used by the user.

Typically, a Windows session begins with the **Start button** in the **taskbar**. An active application window can be minimized to a button in the taskbar. You may open a **Windows folder**, which contains a logical grouping of related files and/or subordinated folders, to obtain a work file.

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A rectangular **application window** contains an **open application** (a running application). Several applications can be open, but there is only one active window at any given time.

Everything that relates to the application noted in the title bar is displayed in the **workspace**. Several **document windows** can be displayed in the parent application window's workspace.

When document content is more than can be displayed in a window, the window is outfitted with **vertical** and/or **horizontal scroll bars**, each with a **scroll box** and two **scroll arrows** to enable **scrolling**.

The horizontal **title bar** at the top of each window has these elements: application icon, window title, Minimize button, Maximize/Restore button, Close button, and the title area.

When you select an item from the menu bar, a subordinate **pull-down menu** is "pulled down." Use the left/right or up/down arrow keys to enter the **mnemonic**, or use the mouse to position the mouse pointer at the desired option. Further selection may result in a menu or a pop-up **dialog box**. A **pop-out** menu results when you choose a menu option followed by a right-pointing arrow. The context-sensitive **pop-up menu** is displayed when you right click the mouse. The **floating menu** "floats" over the display. The **shortcut key** and the **hotkey** help speed up interaction on the keyboard.

Toolbars, containing rectangular graphics, give you ready access to frequently used menu items. The **ruler bar** shows the document window's content relative to the printed page.

The Windows **Explorer**, which can include commonly used icons such as **application icons**, **shortcut icons**, **document icons**, and **disk drive icons**, performs file management tasks such as creating folders, copying files, moving files, deleting files, and other folder/file-related tasks.

The Windows environment lets you view multiple applications that can be resized, shrunk, and arranged by the user within the workspace. Or, they can be arranged as **cascading windows** or **tiled windows**.

The active window is always highlighted in the **foreground**. Other open windows are in the **background**. These terms describe RAM concepts, too.

The most common method of sharing information among applications is to use the Windows **Clipboard** and the *Edit* option in the menu bar. The **source application** and **destination application** for a copy or move operation can be one and the same or they can be entirely different applications.

Applications can be linked through **object linking and embedding**, or **OLE**. An **object** is an item within any Windows application that can be individually selected. We can create **compound documents** that contain one or more objects from other applications. The object originates in a **server application** and is linked to a destination document of a **client application**.

OLE lets you *link* or *embed* information. When you link information, the link between source and destination documents is dynamic. When you embed information, you insert the actual object, not just a pointer.

2-3

PRODUCTIVITY SOFTWARE: THE SOFTWARE SUITE

Word processing lets you create text-based documents into which you can integrate images. When you format a document, you are specifying the size of the page to be printed and how you want the document to look when printed.

The preset format, or *default settings*, may fit your word processing application. A **font**, which refers to the style, appearance, and size of print, is described by its **typeface**. Most word processing packages are considered **WYSIWYG**, short for "What you see is what you get." The find and replace features make all word processing documents searchable. **Clip art** is prepackaged electronic images stored on disk to be used as needed.

Word processing has a variety of features that enable users to enhance the appearance and readability of their documents, including footnoting, numbered and bulleted lists, outline, drawing tools, borders, integration of images, multicolumn text, and more. Word processing software provides the capability of merging data in a database with the text of a document. The *mail-merge* application is an example. Here you merge a *database file* with a *form file*. **Boilerplate** text is existing text that can in some way be reused and customized for a variety of word processing applications.

You can convert word processing documents to create Web pages on the World Wide Web (the Web), the primary application used for viewing information on the Internet.

Word processing can handle most document generation tasks, but those organizations that need to produce complicated documents to be printed professionally use desktop publishing software to create *camera-ready documents*.

Presentation software enables you to create a wide variety of visually appealing and informative presentation graphics. These steps are used with presentation software: (1) *Select a **template***. Microsoft's PowerPoint offers both *design templates* and *content template*. (2) *Create an outline for the presentation*. PowerPoint's tri-pane view lets you view the *slide*, *outline*, and *notes* at the

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same time. **Import** content from other programs directly into PowerPoint slides. **Export** PowerPoint slides to other programs. (3) *Compile and create other nontext resources*. A slide presentation may include text, photo images, charts and graphs, original drawings, clip art, audio clips, and even full-motion video. Among the most popular charts are the pie and bar charts. Presentation software also permits the preparation of organization charts and maps. (4) *Integrate resources*. The PowerPoint *slide sorter* view gives you an overview of the presentation via **thumbnail** images. (5) *Add special effects*. With PowerPoint you can have an image fade out, be wiped away, show animation, or add sound, to name a few. (6) *Add notes*. (7) *Deliver the presentation*.

Spreadsheet software provides an electronic alternative to thousands of traditionally manual tasks that involve rows and columns of data. The intersection of a particular row and column in a spreadsheet designates a **cell**. During operations, data are referred to by their **cell addresses**. The **pointer** can be moved around the spreadsheet to any cell address. To make an entry, to edit, or to replace an entry in a spreadsheet, move the pointer to the appropriate cell.

The four types of **ranges** are a single cell, all or part of a column of adjacent cells, all or part of a row of adjacent cells, and a rectangular block of cells. A particular range is depicted by the addresses of the endpoint cells (for example, C5:E10).

Three major types of entries to a cell are label, numeric, and formula. Spreadsheet formulas use standard programming notation for **arithmetic operators**. Spreadsheets offer predefined operations called **functions**. Each function includes one or more **arguments** that identify the data for the operation.

Different people can use a spreadsheet template over and over for different purposes. If you change the value of a cell in a spreadsheet, all other affected cells are revised accordingly. Spreadsheet packages also can let you generate a variety of charts from spreadsheet data.

Database software lets you enter, organize, and retrieve stored data. Both database and spreadsheet software packages enable us to work with tabular data and records in a database. Database software uses the **relational database** approach to data management. Relational databases are organized in tables in which a row is a record and a column is a field.

In database software, the user-defined structure of a database table identifies the characteristics of each field in it. Related fields are grouped to form records. Content for a *text* field can be a single word or it can be any **alphanumeric** (numbers, letters, and special characters) phrase.

Database software also permits you to retrieve, view, and print records based on **query by example**. To make a query by example, users set conditions for the selection of records by composing a relational expression containing **relational operators** that reflects the desired conditions. Several expressions can be combined into a single condition with **logical operators**.

Records in a database can be sorted for display in a variety of formats. To sort the records in a database, select a primary sort field and, if needed, a secondary sort field. Database software can create customized, or formatted, reports.

Personal information management, or PIM, refers to messaging and personal information management software. PIM software helps you manage your messages, appointments, contacts, and tasks.

Each of the major productivity software packages offers a variety of templates to help you get a head start on your projects. A template is simply a document or file that is already formatted or designed for a particular task.

2-4

APPLICATIONS SOFTWARE FOR YOUR PC

There are over a half-million commercial software packages and downloadable **shareware, freeware, and public-domain software**.

Graphics software facilitates the creation, manipulation, and management of computer-based images. Graphic images are presented as **bit-mapped graphics (file formats include BMP, GIF, TIFF or TIF, PCX, PNG, and JPEG or JPG), vector graphics (CGM and EPS), and metafiles (WMF)**. In bitmapped graphics, or **raster graphics**, the image is composed of patterns of 'lots (pixels). In vector graphics, the image is composed of patterns of lines, points, and other geometric shapes (vectors). The metafile is a class of graphics that combines the components of bit-mapped and vector graphics formats. Paint software, which works with bit-mapped images, provides the user with an electronic canvas.

A wide range of software is available for home PCs that can help us with the many activities of day-to-day living. Popular home applications include greeting cards and banners, tax preparation, and edutainment. Edutainment software combines education and entertainment into a single software package. Most of the reference material distributed on CD-ROM is commercial (for example, encyclopedias) or proprietary; however, with CD-RW we can create our own CD-ROM-based reference material. A wide variety of PC-based business and financial-oriented software packages are available for the home and small office.

Matching

Match each item on the left to the corresponding item at right.

Windows CE	A. copyrighted software
alphanumeric	B. add (+) and subtract (-)
a spinoff of UNIX	C. numbers and letters
arithmetic operator	D. grouping of related files
relational database	E. contains object from another application
freeware	F. location of inactive windows
JPG	G. GUI
graphical user interface	H. common Web file format
range	I. defined area in a spreadsheet
background (windows)	J. move object with mouse
drag	K. described by typeface
compound document	L. Alt+F4
font i	M. operating system for hand helds
folder	N. Linux
shortcut key	O. tables in a database

Self Checks

1. MS-DOS is a state-of-the-art operating system.
 - a. True
 - b. False

2. All computers, including computers dedicated to a particular application, have operating systems.
 - a. False
 - b. True

3. A GUI is:
 - a. text-based
 - b. graphics-based
 - c. paste-based
 - d. label-based

4. The Macintosh family of PCs is unique in that it does not need an operating system.
 - a. False
 - b. True

5. A computing environment that runs more than one platform is what type of environment:
 - a. high platform
 - b. low platform
 - c. multiplatform
 - d. cross-platform

6. UNIX is a subset of Windows 2000 Server, a more sophisticated operating system.
 - a. False
 - b. True

7. The future of the PC/Windows family of operating systems is:
 - a. Windows NEXT
 - b. Windows Me
 - c. Windows XP
 - d. Windows 98

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8. The operating system for the Apple iMac is:
 - a. OS Mac
 - b. iMac OS
 - c. Mac OS X
 - d. The Mac BOSS
9. Which of these is a spin-off of the popular UNIX multi-user operating system:
 - a. Linux
 - b. Linus
 - c. Lucy
 - d. Bendix
10. The proper use of utility software can help keep a PC running at peak efficiency.
 - a. False
 - b. True
11. The universal use of virus vaccine software over the past decade has done away with the threat of computer viruses.
 - a. False
 - b. True
12. To eliminate the possibility of ghosting on modern monitors, the use of screen savers is essential.
 - a. False
 - b. True
13. Which of the following would not be considered utility software:
 - a. gaming
 - b. File maintenance
 - c. backup
 - d. virus protection
14. The process that rearranges file fragments into contiguous files is called:
 - a. folder folding
 - b. unfragging
 - c. defragmentation
 - d. File filling
15. Any software application that does not adhere to the Microsoft Windows standard is a non-Windows application.
 - a. True
 - b. False

16. The cascading windows option fills the workspace in such a way that no document window overlaps another.
 - a. True
 - b. False
17. A Windows folder can contain either files or subordinated folders, but not both.
 - a. True
 - b. False
18. Which of these is a point-and-draw device:
 - a. CD-ROM
 - b. scanner
 - c. mouse
 - d. printer
19. Document windows are displayed in the parent application window's:
 - a. scroll area
 - b. system window
 - c. title bar
 - d. workspace
20. Object linking does not actually place the object into the destination document.
 - a. True
 - b. False
21. What kind of document contains one or more objects from other applications:
 - a. hyperlinked
 - b. compound
 - c. complex
 - d. composite
22. To embed an object, choose the Paste Link option button in the Paste Special dialog box.
 - a. True
 - b. False
23. An online thesaurus can be used to suggest synonyms for a word in a word processing document.
 - a. True
 - b. False

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24. Boilerplate text is existing text that can in some way be reused and customized for a variety of word processing applications.
 - a. False
 - b. True
25. Desktop publishing documents are composed of rectangular:
 - a. doors
 - b. frames
 - c. windows
 - d. boxes
26. What refers to a set of characters of a particular design:
 - a. typeface
 - b. keyface
 - c. calligraph
 - d. stencil
27. The height of a 36-point letter is:
 - a. one-half inch
 - b. 1 inch
 - c. 2 inches
 - d. one-fourth inch
28. In desktop publishing, the emphasis is on overall document composition, not the running text as in word processing.
 - a. False
 - b. True
29. Presentation software allows users to create charts, graphs, and images for use during presentations.
 - a. False
 - b. True
30. The presentation software slide sorter view lets users add or delete slides and rearrange them to meet presentation needs.
 - a. True
 - b. False
31. Audio clips are an example of a nontext resource for presentation software.
 - a. True
 - b. False

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32. A typical slide in a slide presentation would not include:
- content templates
 - clip art and audio clips
 - full-motion video
 - photo images charts, and graphs
33. Which of these is a presentation software special effect:
- notes
 - export file
 - fade out
 - thumbnail
34. The term spreadsheet was coined at the beginning of the personal computer boom.
- True
 - False
35. The intersection of a particular row and column in a spreadsheet designates a cell.
- False
 - True
36. Spreadsheet software works only with numbers and does not generate charts.
- True
 - False
37. A model of a spreadsheet designed for a particular application is sometimes called a template.
- True
 - False
38. The spreadsheet pointer highlights the:
- status cell
 - relative cell
 - merge cell
 - current cell
39. Data in a spreadsheet are referred to by their cell:
- number
 - Box
 - address
 - Code

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40. Which of these is not a range in a spreadsheet:
 - a. row range
 - b. column range
 - c. grazing range
 - d. Block range
41. Database software gives you greater flexibility in the manipulation of rows and columns of data than does spreadsheet software.
 - a. False
 - b. True
42. AND and OR are relational operators.
 - a. True
 - b. False
43. In a database, related fields are grouped to form records.
 - a. False
 - b. True
44. The definition of the structure of a database table would not include which of the following:
 - a. field sizes
 - b. pointer cell
 - c. data types
 - d. field names
45. The relational operator for greater than or equal to is:
 - a. < OR =
 - b. < NOT =
 - c. < AND =
 - d. > OR =
46. Which record(s) would be selected from the COURSE table in Figure 2-28 for the condition TYPE=lecture/lab:
 - a. 101 202, 330, 401
 - b. 100 330, 110, 401
 - c. 110 150, 320, 350
 - d. 202 150, 320, 350
47. Which record(s) would be selected from the STUDENT table in Figure 2-28 for the condition STATUS=complete AND MAJOR=marketing:
 - a. Johnson Charles/100
 - b. Targa Phil/330

- c. Targa Phil/100
 - d. Bell Jim/330
48. Which of these is normally not associated specifically with database terminology:
- a. query by example
 - b. audio clip
 - c. table
 - d. relational
49. Personal information management is concerned with messages, appointments, contacts, and tasks.
- a. False
 - b. True
50. Which of these is messaging and personal information management software:
- a. IPM
 - b. IMP
 - c. MIP
 - d. PIM
51. A template is simply a document or file that is already formatted or designed for a particular task.
- a. True
 - b. False
52. In bit-mapped graphics, the image is composed of patterns of:
- a. vectors
 - b. pictures
 - c. objects
 - d. dots
53. Which type of graphics software package provides a computer-based version of the painter's canvas:
- a. sketch
 - b. illustrator
 - c. draw
 - d. paint
54. What class of graphics combines the components of bit-mapped and vector graphics formats:
- a. metafiles
 - b. raster files

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- c. MIDI files
 - d. text files
55. Which of the following pairs of file formats are used in Web page design:
- a. TIF and PNG
 - b. JPG and GIF
 - c. TIF and PCX
 - d. JPG and BMP
56. Which of the following is not a characteristic of education software:
- a. interactive
 - b. linked
 - c. sequential
 - d. dynamic
57. Which type of software gives the student an opportunity to play while learning:
- a. entertainment
 - b. education
 - c. edutainment
 - d. fun-and-learn
58. In the interactive learning environment, we learn:
- a. only at night
 - b. primarily within workgroups
 - c. at our own pace
 - d. by the schedule in a syllabus
59. Which of the following is not a characteristic of reference material on CD-ROM:
- a. limited to public domain content
 - b. interactive
 - c. searchable
 - d. multimedia
60. Which of these software packages would not be considered a business- specific application:
- a. fitness center
 - b. real estate
 - c. nationwide telephone directory
 - d. physician's clinic
61. Project management software helps you plan and track your projects more effectively.
- a. True
 - b. False

Unit 3: Going Online

3-1

THE INTERNET

The Internet (a worldwide collection of interconnected networks) is comprised of thousands of independent networks in virtually every type of organization. The Department of Defense's ARPANET project was the genesis of the Internet. Volunteers from many nations coordinate the Internet. The Internet is transitioning to a privatization of the domain name registration process.

Communication channels are rated by their **bandwidth**. Channel capacities range from 56,000 **bits per second (bps)** for dialup service to high-speed **broadband access** at 622 M bps for commercial service. Narrowband dialup access is available to anyone with **POTS**—plain old telephone services. Common broadband options, which are up to 30 times faster than narrowband access, include cable, DSL, satellite, and wireless. A cable modem is required for cable access. **DSL (Digital Subscriber Line)** shares an existing telephone line and can provide access speed up to 9 M bps (the **downstream rate**) with an **upstream rate** (sending) of up to 1.5 M bps. The advantage of satellite service is that anyone in America with a southern exposure to the sky and the necessary equipment can have it. Wireless communication lets users take their PC anywhere within the range of a wireless signal and a link to a LAN via an **access point**, a wireless communications hub. The most popular standard used for short-range wireless communication is **Wi-Fi**, based on the **IEEE 802.11b** communications standard. The **IEEE 802.11a** communications standard permits a higher transmission rate but the effective range is less. Wireless devices must be equipped with a **wireless LAN PC card**.

The online world offers a vast network of resources, services, and capabilities. Most of us enter it simply by plugging the phone line into our PC's modem and running our communications software. **Newbies** are novice Internet users.

There are three levels at which you can connect your PC to the Internet. The easiest way to gain access is through a commercial information service's gateway. When you subscribe to a commercial information service such as America Online or CompuServe, you get communications software, a **user ID** (sometimes called a **screen name**), a **password** (required for **logon**), and a user's guide. Or you can make the connection via a **dialup connection** or a broadband connection through an *Internet service provider (ISP)*. At the third level, there is direct connection to the Internet whereby your PC is wired directly

Into the Internet. Such connections often use a DSL line (up to 9 M bps), a **T-1 line** (1.544 M bps), or a **T-3 line** (44.736 M bps).

The Transmission Control Protocol/Internet Protocol (TCP/IP) is the communications protocol that permits data transmission over the Internet. The *Transmission Control Protocol* sets the rules for the packaging of information into **packets**. The *Internet Protocol* handles the address, such that each packet is routed to its proper destination. When you dialup an ISP's local **POP (point-of presence)**, each of which has a unique **IP address**, your dialup connection is made through a **PPP (Point-to-Point Protocol)** connection to an Internet host.

The typical **Internet appliance** integrates access to the Internet, e-mail, a built-in telephone, and home organization applications.

A **client program** runs on your PC and works in conjunction with a companion **server program** that runs on the Internet host computer. The client program contacts the server program, and they work together to give you access to the resources on the Internet server. An *Internet browser* is one kind of client. The dominant browsers are Microsoft Internet Explorer and Netscape.

The **URL (uniform resource locator)**, which is the Internet equivalent of an address, progresses from general to specific. That portion of the URL before the first colon (usually *http*) specifies the access method. The *http* tells the software to expect an **http (Hyper Text Transport Protocol)** file. That portion following the double forward slashes (//) is the server address, or the **domain name**. It has at least two parts, separated by dots (periods). The **top-level domains** or **TLDs**, such as *com* and *org*, denote affiliations. What follows the domain name is a folder or path containing the resources for a particular topic. At the end of the URL is the specific filename of the file that is retrieved from the server. **HTML (Hyper Text Markup Language)** is a **scripting language** used to compose and format most files on the Net. A more feature-rich **XHTML** is to become the new standard.

3-2

INTERNET BROWSERS

Internet browser, or Web browser, software lets us tap the information **resources** of the electronic world. It enables us to retrieve and view Internet-based information, interact with server-based systems, view electronic documents, pass digital information between computers, send and receive e-mail, and join newsgroups. The browser opens an HTML/XHTML document and displays the information according to HTML/XHTML instructions embedded in the document. The HTML/XHTML documents may reference **applets** or **ActiveX controls** which are small programs.

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At the top of the Internet organization scheme are the Internet servers. Each World Wide Web server has one or more **home pages**, the first page you will normally view when traveling to a particular site. Web resources, which may be graphics, audio, video, animation, and text, are viewed in **pages**.

Each Web page is actually a file with its own URL. We navigate to an address on the Internet just as we drive to a street address. **Hyperlinks**, in a form of *hypertext*, *hot images*, or *hot icons*, permit navigation between pages and between other resources on the Internet. The pages at a server site are set up within a hierarchy of URLs.

The basic elements used for server navigation and viewing include the menu bar, the toolbar, the URL/search bar, the workspace, and the status bar. The toolbar has several navigational buttons, including the Search button. This button calls up the Internet portal that you have selected as your default search site. **Portals** are Web sites that offer a broad array of information and services, including a menu tree of categories and a capability that helps us find online resources.

There are a number of complementary applications, called **plugins**, which can enhance the functionality of browsers. Examples include *Shockwave Player*, *QuickTime*, and *RealPlayer*, which let you listen to **streaming audio** and view **streaming video**.

3-3

INTERNET RESOURCES AND APPLICATIONS

There are three ways to search the Internet: *browse*, *search*, and *ask someone*. You can browse through menu trees of *categories* or you can search using a variety of resource discovery tools, including **search engines**. People on the Net are ready to help those in need. There are also **FAQ (frequently asked questions)** pages and files.

The World Wide Web is an Internet application that permits linking of multimedia documents among Web servers on the Internet. By establishing a linked relationship between Web documents, related information becomes easily accessible. Web resources are designed to be accessed with easy-to-use browsers.

Web pages are linked via hyperlinks. The Web enables interactivity between users and servers. For example, you can click on **option buttons** to select desired options. Some Web sites present some or all of their information in **frames**.

The **File Transfer Protocol (FTP)** allows you to download and upload files on the Internet. Most are **anonymous FTP** sites. **Webcasting** (Internet broadcasting) has emerged as a popular Internet application. With **pull technology** the user requests information via a browser. With **push technology** information is sent automatically to a user.

Digital jukebox software records, stores, and plays music on the PC. It can help you gather MP3 and other audio files from Internet music resources.

The Internet is an aid to better communication. You can send e-mail to and receive it from anyone with an Internet e-mail address. The two ways to send/receive e-mail are via e-mail client software or via Web-based e-mail, which is handled through interaction with a Web site.

The Internet e-mail address has two parts, the username and the domain name, and is separated by an @ symbol. The domain name identifies the **e-mail server**. An **attached file** can be sent with an e-mail message. **Post Office protocol** refers to the way your e-mail client software gets your e-mail from the server.

Audio mail lets you speak your Internet message instead of typing it.

A newsgroup can be hosted on Internet servers and on **USENET** servers. People who frequent newsgroups refer to the original message and any posted replies to that message as a **thread**. The Internet **mailing list** (listserv) is a cross between a newsgroup and e-mail.

The **Internet Relay Chat (IRC)** protocol allows users to participate in group chat sessions. A chat session is when two or more Internet users carry on a typed, real-time, online conversation.

Instant messaging is a convenient way for you to know when your friends are online so you can communicate with them in real time. Some versions of instant messaging software permit file/application sharing, **whiteboarding**, and the ability to have audio and video conferencing.

The Internet phone capability lets you call people at other computers on the Internet. Internet telephone service is available that will let you call any traditional telephone in the world via your PC and the Internet. People who communicate online have invented keyboard shortcuts and **emoticons** to speed up the written interaction and convey emotions. Rules of **netiquette**, Internet etiquette, demand sensitivity and concern for others in cyberspace.

The Internet offers a vast treasure trove of information and services.

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Matching

Match each item on the left to the corresponding item at right.

netiquette	A. Net resource discovery tool
newsgroup	B. USENET
broadband access	C. scripting language
search engine	D. satellite
POP	E. millions of bits
TCP/IP	F. linking people in real-time
ARPANET	G. rules for Internet packets
instant messaging	H. access point to the Net
upstream rate	I. early Internet
megabits	J. data sent per unit time
bandwidth	K. channel capacity
universally available Net access	L. PPP
dialup connection	M. IEEE 802.11b
HTML	N. Internet etiquette
Wi-Fi	O. high-speed Internet

Self Checks

1. One way to go online is to subscribe to a commercial information service.
 - a. True
 - b. False
2. America Online has a self-contained network.
 - a. False
- b. True
3. The Internet is like AOL, a commercial information service.
 - a. True
- b. False
4. ARPANET was the first commercially available communications software package.
 - a. False
 - b. True
5. A newbie is anyone with a fear of cyberspace.
 - a. True
 - b. False
6. Which of the following is not a link to the Internet:
 - a. interstate bonds
 - b. cable
 - c. DSL
 - d. wireless satellite
7. Which of the following is not included with a subscription to an information service:
 - a. a password
 - b. communications software
 - c. speech-recognition software
 - d. a user ID
8. Which of the following is not an online commercial information service:
 - a. the Web
 - b. Dow Jones Business Information Service
 - c. AOL
 - d. CompuServe

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9. Which of these is not a U.S. top-level domain affiliation ID:
 - a. org
 - b. gov
 - c. edu
 - d. moc
10. In the URL, *http://www.abccorp.com/pr/main.htm*, the domain is:
 - a. *http*
 - b. *www.abccorp.com*
 - c. *WWW*
 - d. *Pr/main.htm*
11. What type of company provides people with access to the Internet:
 - a. PSI
 - b. SPI
 - c. IPS
 - d. ISP
12. In the e-mail address, *mickey_mouse@disney.com*, the user ID is:
 - a. *disney.com*
 - b. *mouse*
 - c. *mickey_mouse*
 - d. @
13. A 56,000 bits-per-second channel is the same as a:
 - a. dual 28000X2 K bps line
 - b. 56 kps pipe
 - c. 56 K bps line
 - d. single-channel DSL
14. A communication channel is rated by its:
 - a. channel aptitude
 - b. flow
 - c. bandwidth
 - d. datastream
15. Narrowband has slightly more capacity than broadband.
 - a. False
 - b. True
16. Which broadband service has a built-in lag in response time:
 - a. DSL
 - b. Wi-Fi

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- c. satellite
 - d. cable
17. Which of these would not be associated with a wireless local area network:
- a. IEEE 80211b
 - b. DSL
 - c. Wi-Fi
 - d. access points
18. Every home user is assigned a permanent IP address on the Internet.
- a. False
 - b. True
19. Internet portals are designed to permit searches by category or by keyword, but never both.
- a. True
 - b. False
20. On the Internet, only hypertext hyperlinks are hot.
- a. True
 - b. False
21. Which of the following labels might be included with an Internet address:
- a. <bps>
 - b. ULS
 - c. http://
 - d. fpt://
22. The opening page for a particular Web site normally is the:
- a. home page
 - b. opener page
 - c. flip-flop page
 - d. master page
23. Which of the following buttons is not one of the main buttons on a browser toolbar:
- a. House
 - b. Back
 - c. Refresh
 - d. Forward

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24. Web pages can be tied together by:
- a. cybertext links
 - b. hydrolinks
 - c. hydratext links
 - d. Hyperlinks
25. Yahoo! is a site on the Internet that can be used to browse the Net by content category.
- a. False
 - b. True
26. Subscribing to a popular mailing list would result in more Internet e-mail than posting a message to a newsgroup.
- a. False
 - b. True
27. A file attached to an e-mail is routed to the recipient's e-mail server computer along with the message.
- a. True
 - b. False
28. Which server on the Internet offers hypertext links:
- a. ftp
 - b. QQQ
 - c. Web
 - d. Gopher
29. All but which one of these would be a common way to search for information on the Internet:
- a. Browse
 - b. ask someone on the Net
 - c. push/pull
 - d. Search
30. What Web features enable the display of more than one page on a screen:
- a. borders
 - b. frames
 - c. structures
 - d. windows
31. Generally, today's Internet applications are based on what technology:
- a. pull
 - b. Push

- c. Place
- d. Draw

32. On a newsgroup, the original message and any posted replies to that message are a:
- a. Needle
 - b. Tapestry
 - c. pinpoint
 - d. Thread

Unit 4: Inside the Computer

4-1

GOING DIGITAL

The two kinds of electronic signals are analog and digital. To make the most effective use of computers and automation, the electronics world is going digital. The music industry digitizes the natural analog signals that result from recording sessions, then stores the digital version on CDs. Computers are digital and, therefore, work better with digital data.

The two digital states of the computer—on and off—are represented by a bit, short for binary digit. These electronic states are compatible with the binary numbering system. Letters and decimal numbers are translated into bits for storage and processing on computer systems.

Data are stored temporarily during processing in RAM and permanently on devices such as disk drives.

Alphanumeric (alpha and numeric) characters are represented in computer storage by unique bit configurations. Characters are translated into these bit configurations, also called bytes, according to a particular coding scheme, called an encoding system.

The 7-bit ASCII encoding system is the most popular encoding system for PCs and data communication. An extended version of ASCII, an 8-bit encoding system, offers 128 more codes. Microsoft Windows uses the 8-bit ANSI encoding system.

Unicode, a uniform 16-bit encoding system, will enable computers and applications to talk to one another more easily and will accommodate most of the world's languages.

The hexadecimal, or base-16, numbering system is used as shorthand to display the binary contents of RAM and disk storage.

4-2

THE PC SYSTEM UNIT

The processor, RAM, and other electronic components are housed in the system unit. The processor is literally a computer on a chip. This processor, the

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electronic circuitry for handling input/output signals from the peripheral devices, and the memory chips are mounted on a single circuit board called a board. The motherboard's chipset controls the flow of information between system components.

The bus is the common pathway through which the processor sends/Receives ,data and commands to/from RAM and disk storage and all I/O peripheral devices. Like the wheeled bus, the bus provides data transportation to all components, memory, and device controllers.

Most new system units have an Intel Pentium® 4, Celeron® or Itanium™ processor Inside, but many older systems with Pentium®, Pentium® Pro, Pentium ® II, and Pentium® III processors continue to be workhorses.

The processor is the nucleus of any computer system. A processor, which is also in called the central processing unit or CPU, has only two fundamental sections, the control unit and the arithmetic and logic unit, which work together with RAM to execute programs. The control unit's decoder interprets instructions, Then the control unit directs the arithmetic and logic unit to perform computation and logic operations. During execution, instructions and data are passed between very high-speed registers (for example, the instruction register, the program register, and the accumulator) in the control unit and the arithmetic and logic unit.

RAM or random-access memory, provides the processor with temporary storage for programs and data. Physically, memory chips are installed on single in-line memory modules (SIMMs), dual in-line memory modules (DIMMs), and rambus in-line memory modules (RIMMs). Most new PCs are being equipped with synchronous dynamic RAM (SDRAM), DDR SDRAM, or Rambus DRAM (RDRAM).

In RAM, each datum is stored at a specific address. RAM is volatile memory (contrast with nonvolatile memory), that is, the data are lost when the electrical current is turned off or interrupted. All input/output, including must enter and exit RAM. Other variations of internal storage are Read-only programmable memory (PROM), and flash memory, a nonvolatile memory. The BIOS software is stored in flash memory.

Some computers employ cache memory (level 1 and level 2) to increase throughput (the rate at which work can be performed by a computer system). In * RAM, cache is a high-speed holding area for program instructions and data. However, cache memory holds only those instructions and data likely to be needed next by the processor.

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instruction cycle time is the total of the instruction time (I-time) and the execution time (E-time). Most modern processors are capable of pipelining to speed up processing.

The motherboard includes several empty expansion slots so you can purchase and plug in optional capabilities in the form of expansion boards or expansion cards. The most common expansion boards plug into a PCI local bus. The SCSI bus, or "scuzzy" bus, allows up to 15 SCSI peripheral devices to be daisy-chained to a SCSI interface expansion card. The Universal Serial Bus (USB) permits up to 127 USB peripheral devices to be hot plugged to the PC. The USB 2.0 standard is 40 times faster than the original USB standard. The 1394 bus (FireWire in the Apple world) is a bus standard that supports data transfer rates of up to 400 M bps. The AGP bus is a special-function bus for high-resolution 3-D graphics.

In a PC, external peripheral devices come with a cable and a multipin connector. A port provides a direct link to the PC's common electrical bus. External peripheral devices can be linked to the processor via cables through a serial port, parallel port, SCSI port, USB port, 1394 port, or IrDA (infrared) port. The standard for PC serial ports is the RS-232C connector. The RS-232C and Centronics connectors are used with parallel ports.

Popular expansion boards include graphics adapters such as the AGP or accelerated graphics port board, sound, data/voice/fax modem (enables emulation of a fax machine), network interface card (NIC), and video capture card.

The PCMCIA card, sometimes called a PC card, provides a variety of interchangeable add-on capabilities in the form of credit-card-sized modules. The PC card is especially handy for the portable environment. A mobile GPS (global positioning system) can be a PC card.

4-3

DESCRIBING THE PROCESSOR AND ITS PERFORMANCE

A processor is described in terms of its word size (bus width), core speed, bus speed, and memory capacity.

A word is the number of bits handled as a unit within a particular computer system common electrical bus or during internal processing.

Personal computer speed, called the core speed, is measured in megahertz (MHz) and gigahertz (GHz). High-end PC, workstation, and server computer speed is measured in MIPS. Supercomputer speed is measured in FLOPS.

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Bus speed, which is less than core speed, is measured in cycles per second. Bus speed can be a bottleneck in processing performance.

Memory capacity is measured in **kilobytes (KB)**, **megabytes (MB)**, **gigabytes (GB)**, and **terabytes (TB)**. Chip capacity is sometimes stated in **kilobits (Kb)** **megabits (Mb)**.

4 -4

PROCESSOR DESIGN

In Parallel processing, one main processor examines the programming Problem and determines what portions, if any, of the problem can be solved in Pieces .Those pieces that can be addressed separately are routed to other processors, solved, then recombined in the main processor to produce the Parallel processing on a large scale is referred to as massively parallel processing (MPP).

Neural networks mimic the way the human brain works. The neural network computer uses many small, interconnected processors to address problems that Involve unstructured information.

the basic premise of grid computing is to use available computing resources more effectively. Grid computing addresses a single programming problem by tapping the unused processing capabilities of many PCs via a network.

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Matching

Match each item on the left to the corresponding item at right.

1394 bus	A. in processor control unit
DDR SDRAM	B. stored in flash
pipelining	C. motherboard flow control
binary	D. 1, 0
Pentium 4	E. type of memory
chipset	F. base 16
Moore's Law	G. language of computers
BIOS	H. rate of work by a CPU
grid computing	I. graphics adapter
registers	J. FireWire
ASCII	K. overlapping instruction execution
machine language	L. Intel processor
throughput	M. doubling of transistors each 1.5 years
hexadecimal	N. networking of unused computing capacity
AGP	O. encoding

Self Checks

1. Bit Is the singular of byte.
 - a. TRUE
 - b. FALSE

2. THE HEXADEcimal NUMBERING SYSTEM HAS 26 UNIQUE NUMBERS.
 - a. FALSE
 - b. TRUE

3. STEREO MUSIC CANNOT BE DIGITIZED.
 - a. TRUE
 - b. FALSE

4. THE BASE OF THE BINARY NUMBER SYSTEM IS:
 - a. 8
 - b. 2
 - c. 32
 - d. 16

5. HOW MANY ANSI BYTES CAN BE STORED IN A 32-BIT WORD:
 - a. 8
 - b. 4
 - c. 2
 - d. 6

6. What is the ASCII code for Q if the code for P is 01010000:
 - a. 01010011
 - b. 01010001
 - c. 01011111
 - d. 01010010

7. A hexadecimal A3 is what in binary:
 - a. 00111010
 - b. 10100011
 - c. 01010011
 - d. 11110011

8. The control unit Is that part of the processor that reads and interprets program instructions, a. False

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9. PC cards can be hot swapped while the PC is running.
 - a. FALSE
 - b. TRUE

10. THE 1394 BUS TRANSFERS DATA AT A SLOWER RATE THAN THE USB BUS.
 - a. FALSE
 - b. TRUE

11. Which of the following memory groups are in order based on speed (slowest to fastest):
 - a. cache registers, RAM
 - b. registers cache, RAM
 - c. RAM cache, registers
 - d. cache RAM, registers

12. BIOS software is stored permanently:
 - a. in DDR SDRAM
 - b. on DVD-ROM
 - c. on hard disk
 - d. in flash memory

13. Which one of the following would not be attached to a motherboard:
 - a. RAM
 - b. expansion board
 - c. processor
 - d. FLOP

14. Which port enables the parallel transmission of data within a computer system:
 - a. serial
 - b. speaker
 - c. parallel
 - d. Centronics

15. Which two buses enable the daisy chaining of peripheral devices:
 - a. PCI local bus and ISA
 - b. USB and PCI local bus
 - c. SCSI and infrared
 - d. USB and SCSI

16. The word size of all PCs is 32 bits.
 - a. False
 - b. True

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17. Bus speed is always the same as core speed.
 - a. TRUE
 - b. FALSE
18. A GIGABYTE OF RAM HAS MORE STORAGE CAPACITY THAN A MEGABIT OF RAM.
 - a. FALSE
 - b. TRUE
19. Which of these would not be a major factor in processor performance:
 - a. bus length
 - b. core speed
 - c. size of RAM
 - d. bus width
20. A high-capacity hard disk would be measured in:
 - a. MB or GB
 - b. KB or TB
 - c. kilobits or megabits
 - d. GB or TB
21. Supercomputer speed is measured in:
 - a. FLOPS
 - b. MOPS
 - c. POPS
 - d. LOPS
22. IN PARALLEL PROCESSING, TWO MAIN PROCESSORS EXAMINE THE PROGRAMMING PROBLEM AND DETERMINE WHAT PORTIONS, IF ANY, OF THE PROBLEM CAN BE SOLVED IN PIECES.
 - a. TRUE
 - b. FALSE
23. IN GRID COMPUTING, ALL PCs ON THE GRID MUST COMMIT THEIR RESOURCES UNTIL PROCESSING IS COMPLETE.
 - a. TRUE
 - b. FALSE
24. GRID COMPUTING IS WELL AHEAD OF THE INTERNET IN TECHNOLOGICAL EVOLUTION.
 - a. TRUE
 - b. FALSE
25. The concept of using multiple processors in the same computer system is known as:
 - a. perpendicular processing

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- b. acute processing
 - c. massive processing
 - d. parallel processing
26. Neural networks process unstructured information:
- a. as time permits
 - b. intermittently
 - c. simultaneously
 - d. sequentially
27. The neural network computer employs many small, interconnected processors, called:
- a. brain units
 - b. neurals nets
 - c. mini PCs
 - d. processing units
28. Grid computing takes advantage of what capabilities in remote PCs:
- a. unused processing
 - b. Net search
 - c. printing
 - d. lattice uploadin

Unit 5: Storing and Retrieving Information

5-1

MASS STORAGE, FILES, AND FILE MANAGEMENT

Data and programs are stored in mass storage for permanent storage. Magnetic disk drives and magnetic tape drives are popular devices for mass storage. Tape is used mostly for backup capability and archival storage. Optical laser disc technology continues to emerge as a mass storage medium.

The file is the foundation of permanent storage on a computer system.

Filenames in the Windows environment can include spaces, but some special characters are not permitted. An optional three-character extension identifies the type of file (for example, myphoto.gif is a graphics file). Popular file types include the ASCII file (txt), data file (mdb for Access), document file (doc for Word), spreadsheet file (xls for Excel), Web page file (htm), source program file (vbp for Visual Basic), executable program file (exe), graphics file (gif, bmp, jpg, tif, and pcx), audio file (wav), and video file (mov). Most popular applications programs have at least one native file format.

Everything we do on a computer has to do with a file and, therefore, mass storage. We can create, name, save, copy, move, delete, retrieve, update, display, print, play, execute, download, upload, export, import, compress, and protect files. File compression is used to economize on storage space. PC users routinely compress files to zip files for download/upload on the Net and unzip the compressed or "zipped" files for use in applications. The executable self extracting zip file must be executed to unzip the file(s).

The Windows Explorer is a utility program that lets you view and manage folders/files. Folders are created for specific disk drives. You must give the operating system the path to follow to store or retrieve a particular file. Common file management activities include save/save as, open, copy, move, delete, and rename.

5-2

MAGNETIC DISKS

Data are retrieved and manipulated either sequentially or randomly. There are two types of magnetic disks: Interchangeable magnetic disks and fixed

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Magnetic disks. Magnetic disk drives enable random- and sequential- processing capabilities.

Popular types of interchangeable magnetic disks include the 3.5-inch diskette, also called a floppy disk, the 120 MB Super Disk, the 200 MB HiFD disk, and the 100 MB, 250 MB, or 750 MB Zip disk, which is inserted into a Zip drive. The floppy disk, Super Disk, and HiFD disk are the same size but have different disk densities.

There are three types of hard disks—those that are permanently installed, those that are portable, and those that are interchangeable between like systems. Hard disks contain at least one platter and usually several disk platters stacked on a single rotating spindle. The rotation of a magnetic disk passes all data under or over read/write heads, which are mounted on access arms. The portable hard disk is an external device that is easily connected to any personal computer via a USB port or FireWire port.

The way in which data and programs are stored and accessed is similar for both hard and interchangeable disks. Data are stored via serial representation in concentric tracks on each recording surface. The spacing of tracks is measured in tracks per inch (TPI). In sector organization, the recording surface is divided into pie-shaped sectors, and each sector is assigned a number. Adjacent sectors are combined to form clusters.

Each disk cluster is numbered, and the number of the first cluster in a file comprises the disk address on a particular file. The disk address designates a file's physical location on a disk. A particular cylinder refers to every track with the same number on all recording surfaces.

Some high-performance disk manufacturers employ zoned recording where zones contain a greater number of sectors per track as you move from the innermost zone to the outermost zone.

Each disk used in the Windows environment has a Virtual File Allocation Table (VFAT) in which information about the clusters is stored. Clusters are chained together to store file information larger than the capacity of a single cluster. The Scan Disk utility lets you return lost clusters to the available pool of usable clusters.

The defragmentation process rewrites fragmented files into contiguous clusters. A Windows utility program called Disk Defragmenter consolidates files into contiguous clusters.

Before a disk can be used, it must be formatted. Formatting creates sectors and tracks into which data are stored and establishes an area for the VFAT.

The access time for a magnetic disk is the interval between the instant a computer makes a request for transfer of data from a disk-storage device to RAM and the instant this operation is completed. The data transfer rate is the rate at which data are read from (written to) mass storage to (from) RAM. Disk caching improves system speed. Apply the dictates of common sense to the care of diskettes (avoid excessive dust, avoid extremes in temperature and humidity, and so on).

5-3

OPTICAL LASER DISCS

Optical laser disc storage is capable of storing vast amounts of data. The main categories of optical laser discs are **CD, CD-ROM, CD-R, CD-RW, DVD, DVD-ROM, DVD-R, DVD+RW, DVD-RW, DVD-RAM,** and **FMD-ROM.**

A CD-ROM is inserted into the CD-ROM drive for processing. Most of the commercially produced read-only CD-ROM discs contain reference material or support multimedia applications. Multi disk player/changers are called Jukeboxes.

A blank compact disc-recordable (CD-R) disc looks like a CD-ROM and once information is recorded on it, it works like a CD-ROM. CD-ReWritable (CD-RW) allows users to rewrite to the same CD media and "burn" discs, such as audio CDs.

The DVD (digital video disc) looks like the CD and the CD-ROM, but it can store up to about 17 GB. DVD drives can play CD-ROMs and CDs. DVD-R is like CD-R but with the recording density of DVD-ROM. DVD-RAM, DVD+RW, and DVD-RW are like CD-RW, giving us rewritable capabilities for high-capacity DVD technology. FMD-ROM, a very high density, multilayer disc, holds up to 140 GB of data.

The typical PC will have at least a DVD-ROM drive and possibly another read/write disc drive. Most people who want to burn discs and use optical media for backup and transfer purposes are installing a DVD-ROM/CD-RW combination drive or a DVD+RW/CD-RW combination drive.

The choice of which technologies to choose for a system or an application is often a trade-off between storage capacity, cost (dollars per megabyte), and speed (access time).

Each year, improvements are made in existing mass storage devices as the storage industry strives to meet our craving for more storage.

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5-4

VIRUSES AND VIRUS PROTECTION

A computer virus is a program that "infects" other programs and databases upon contact. A macro virus is a program that is written in the macro language of a particular application. A worm is a computer program that exists as a separate entity and invades computers via e-mail and IRC. The Trojan horse does not replicate itself but depends on the cooperation of unsuspecting users to spread itself.

The primary sources of computer viruses are the Internet (e-mail and downloads), common interchangeable disks, and computer networks. Antivirus programs exist to help fight viruses.

5-5

BACKING UP FILES: BETTER SAFE THAN SORRY

You can replace your computer, but you often cannot replace your lost files, so back up your files. The backup process provides protection against loss of valuable files and enables archiving of files. Popular PC backup media includes rewritable optical media, diskettes/floppies, high-capacity diskettes, and portable hard disks.

Three common backup methods are full backup, selective backup of files, or incremental backup. When backing up only critical daily-use files, use at least two generations of backup.

Beside backup to a local disk/disc, you can also backup to a server computer, to another PC on a home network, to a notebook/desktop PC, or to magnetic tape drives, called tape backup units (TBUs), that use data cartridges. When downtime is unacceptable, the network server must be made fault-tolerant. RAID (Redundant Array of Independent Disks) minimizes the impact of catastrophic disk failure by spreading data across several integrated disk drives.

Storing and Retrieving Information

Matching

Match each item on the left to the corresponding item at right.

fault-tolerant system	A. rewritable optical disc
fixed disk	B. worm
simgame.exe	C. tape backup
TBU	D. hard disk
zoned recording	E. has multiple tracks
virus type	F. copy/cut/paste
disk clusters	G. mov
DVD+RW	H. reference to file location
native file format	I. compressed file
video file type	J. depends on read/write head movement
Path	K. permits continuous server operation
edit menu	L. executable file
zip file	M. uses disk space efficiently
Cylinder	N. chained together
disk access time	O. associated with a program

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Self Checks

1. An ASCII file is a text-only file that can be read or created by any word processing program or text editor.
 - a. FALSE
 - b. TRUE
2. WINTER.SALES AND .ADD ARE VALID FILENAMES IN THE WINDOWS ENVIRONMENT.
 - a. TRUE
 - b. FALSE
3. THE WINDOWS EXPLORER IS AN INTEGRATED WEB BROWSER AND FILE MANAGEMENT TOOL.
 - a. FALSE
 - b. TRUE
4. IN A MOVE FILE/FOLDER OPERATION, THE FILE IN THE ORIGINAL FOLDER IS UNCHANGED.
 - a. TRUE
 - b. FALSE
5. We do all of the following to files except:
 - a. update files
 - b. throw files
 - c. create files
 - d. execute files
6. Which of the following is not a type of file:
 - a. book
 - b. spreadsheet
 - c. source program
 - d. audio
7. What must you give the operating system to retrieve a particular file:
 - a. the outbound corridor
 - b. Its hierarchical position
 - c. The file's path
 - d. Its directory name
8. Which path separator symbol is not used in some operating systems:
 - a. \
 - b. /
 - c. :
 - d. ;

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9. Magnetic disks have sequential-access capabilities only,
 - a. False
 - b. True
10. Hard disks and fixed disks are one and the same.
 - a. FALSE
 - b. TRUE
11. BOTH THE DISKETTE AND THE HiFD DISK ARE THE SAME SIZE BUT HAVE DIFFERENT! DISK DENSITIES.
 - a. TRUE
 - b. FALSE
12. INFORMATION ON INTERCHANGEABLE DISKS CANNOT BE STORED OFFLINE.
 - a. TRUE
 - b. FALSE
13. THE HIGHEST-CAPACITY ZIP DISK HAS A GREATER CAPACITY FOR STORAGE THAN THE HiFD DISK.
 - a. FALSE
 - b. TRUE
14. TPI STANDS FOR TRACKS PER INCH.
 - a. FALSE
 - b. TRUE
15. THE CAPACITY OF CLUSTERS IS BASED ON A MULTIPLE OF 521 BYTES.
 - a. TRUE
 - b. FALSE
16. IN A DISK DRIVE, THE READ/WRITE HEADS ARE MOUNTED ON AN ACCESS ARM.
 - a. FALSE
 - b. TRUE
17. BEFORE A DISK CAN BE USED, IT MUST BE FORMATTED.
 - a. TRUE
 - b. FALSE
18. THE INNERMOST ZONE HAS FEWER SECTORS THAN THE OUTERMOST ZONE IN ZONED RECORDING.
 - a. TRUE
 - b. FALSE



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19. Which of these statements is not true:
 - a. a hard disk contains several disk platters stacked on a single rotating spindle
 - b. the standard size for PC hard disks (diameter) is 8 inches
 - c. the rotation of a magnetic disk passes all data under or over a read/write head
 - d. the heads are mounted on access arms
20. The standard size for common diskettes is:
 - a. 35 inches
 - b. 325 inches
 - c. 525 inches
 - d. 375 inches
21. The VFAT is searched by the operating system to find the physical address of the
 - a. midsector of the file
 - b. read/write head
 - c. first cluster of the file
 - d. microprocessor
22. What denotes the physical location of a particular file or set of data on a magnetic disk:
 - a. disk address
 - b. CD-R
 - c. cylinder
 - d. data compression index
23. TPI refers to:
 - a. cylinder overload
 - b. sector density
 - c. track density
 - d. bps thickness
24. The disk caching area is:
 - a. on the monitor's expansion board
 - b. on a hard disk
 - c. in RAM
 - d. on a floppy disk
25. In zoned recording, tracks are grouped into:
 - a. zones
 - b. sectors

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- c. partitions d. regions
- 26. ROM Is a spinoff of audio CD technology.
 - a. True b. False
- 27. CD-ROM stores data in spiraling tracks.
 - a. True b. False
- 28. Jukebox refers to a player/changer that can handle multiple CD-ROMs.
 - a. False b. True
- 29. DVD+RW is like rewritable storage technology,
 - a. False
 - b. True
- 30. The CD-ROM drive specifications 32X, 40X, or 75X refer to its:
 - a. number of platters b. diameter c. sector groupings d. speed
- 31. The data transfer rate for a 40X CD-ROM is how many MB per second: A.
 - 12 b. 6
 - c. 1125 d. 3
- 32. Which optical laser disc has the greatest storage capacity:
 - a. double-sided DVD-ROM
 - b. 75X CD-ROM
 - c. CD-RW
 - d. FMD-ROM
- 33. Worms exist as separate entities and do not attach themselves to files,
 - a. False
 - b. True

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34. The Trojan horse e-mails itself.
 - a. TRUE
 - b. FALSE

35. ALL DOWNLOADED FILES ON THE INTERNET ARE CHECKED FOR VIRUSES AT THE ISP LEVEL, ELIMINATING THE NEED FOR ANTIVIRUS SOFTWARE AT THE PC LEVEL.
 - a. FALSE
 - b. TRUE

36. THE PROFILE OF ONE WHO WRITES VIRUSES IS AN OLDER FEMALE FROM SOUTHEAST ASIA.
 - a. TRUE
 - b. FALSE

37. IT IS RECOMMENDED TO DELETE E-MAILS FROM UNKNOWN, SUSPICIOUS, OR UNTRUSTWORTHY SOURCES.
 - a. FALSE
 - b. TRUE

38. What can hide and duplicate itself within legitimate programs:
 - a. PC bug
 - b. computer virus
 - c. program germ
 - d. Trojan horse

39. Which of these is not a virus:
 - a. The Cookie Monster
 - b. Wooden Horse
 - c. Love.bug
 - d. Melissa

40. Which of these is not a source for computer viruses:
 - a. the Net
 - b. interchangeable disks
 - c. antivirus programs
 - d. computer networks

41. Sometimes viruses are attached to:
 - a. disk labels
 - b. e-mails
 - c. chat notes
 - d. hypertext

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42. Any system with a weekly backup requirement from 100 MB to 1 GB is a candidate to use floppies as a backup medium.
- TRUE
 - FALSE
43. A FAULT-TOLERANT NETWORK IS ONE DESIGNED TO HAVE CONTINUOUS OPERATION.
- TRUE
 - FALSE
44. INCREMENTAL BACKUPS PLAY NO ROLE IN RESTORING FILES.
- TRUE
 - FALSE
45. THE BACKUP PROCESS SERVES TWO IMPORTANT FUNCTIONS—PROTECTION AGAINST LOSS OF VALUABLE FILES AND CACHE STORAGE.
- FALSE
 - TRUE
46. Which of these would not be considered a backup medium:
- portable hard disk
 - Zip disk
 - DVD-ROM
 - CD-RW
46. Which of the following generally is not an application for magnetic tape storage:
- archival storage
 - medium for transfer between computers
 - routine information processing
 - backup for disk storage
47. In the full backup method:
- only volatile files are backed up
 - only those files that have been modified since the last backup are backed up
 - only user-selected files are backed up
 - All files are backed up
48. When performing critical files backup using interchangeable disks it is best to maintain at least:
- one generation
 - four generations
 - eight generations
 - two generations