

Unit 1

Section One: Reading Comprehension

The Information Society

Where will you be and what will you be doing in the year 2020? This is a tough question even for technology experts who are reluctant to speculate more than a few months into the future. Things are changing too quickly. A continuous stream of exciting new innovations in **information technology (IT)** continues to change what we do and how we think. We use the term *IT* to refer to the integration of computing technology and information processing.

Most of us are doing what we can to adapt to this new **information society** where **knowledge workers** channel their energies to provide a cornucopia of computer-based information services. A knowledge worker's job function revolves around the use, manipulation, and dissemination of information. Your knowledge of computers will help you cope with and understand today's technology so you can take your place in the information society, both at the workplace and during your leisure time.

Information Technology Competency

Not too long ago, people who pursued careers in almost any facet of business, education, or government were content to leave computers to computer professionals. Today these people are knowledge workers. In less than a generation, **information technology competency (IT competency)** has emerged in virtually any career from a *nice-to-have skill* to a *job-critical skill*.

If you're afraid of computers, information technology competency is a sure cure. IT competency will allow you to be an active and effective participant in the emerging information society.

The Technology Revolution

In an information society, the focus of commerce becomes the generation and distribution of information. A technological revolution is changing our way of life: the way we live, work, and play. The cornerstone of this revolution, the *computer*, is transforming the way we communicate, do business, and learn.

Personal computers, or **PCs**, offer a vast array of *enabling technologies*. Enabling technologies help us do things. For example, PCs have maps that pinpoint your location to help you navigate the streets of the world. They have presentation tools that help you make your point when you get there. Already, you need go no farther than your home computer to get the best deal on a new car, order tickets to the theater, play chess with a grand master in Russia, or listen to a radio station in New Zealand.

Foundation for Our Information Society

Data (the plural of *datum*) are just raw facts. Data are all around us. Every day we generate an enormous amount of data. **Information** is data that have been collected and processed into a meaningful form. Simply, information is the meaning we give to accumulated facts (data). Information as we now know it, though, is a relatively new concept. Just 50 short years ago, *information* was the telephone operator who provided directory assistance. Around 1950, people began to view information as something that could be collected, sorted, summarized, exchanged and processed. But only during the last decade have computers allowed us to begin tapping the potential of information.

Computers are very good at digesting data and producing information. For example, when you run short of cash and stop at an automatic teller machine, all data you enter, including that on the magnetic stripe of your bankcard, are processed immediately by the bank's computer system. A computer system eventually manipulates your *data* to produce *information*. The information could be an invoice from a mail-order house or a bank statement.

Traditionally, we have thought of data in terms of numbers (account balance) and letters (customer name), but recent advances in information

technology have opened the door to data in other formats, such as visual images. For example, dermatologists (physicians who specialize in skin disorders) use digital cameras to take close-up pictures of patients' skin conditions. Each patient's **record** (information about the patient) on the computer-based **master file** (all patient records) is then updated to include the digital image. During each visit, the dermatologist recalls the patient record, which includes color images of the skin during previous visits. Data can also be found in the form of sound. For example, data collected during noise-level testing of automobiles include digitized versions of the actual sounds heard within the car.

The relationship of data to a computer system is much like the relationship of gasoline to an automobile. Data provide the fuel for a computer system. Your car won't get you anywhere without gas, and your computer won't produce any information without data.

(Larry & Nancy Long: pp. 4-8)

Part I. Comprehension Exercises

A. Put "T" for true and "F" for false statements. Justify your answers.

- 1. Computer experts are able to speculate about the future of man's technological achievements.
- 2. To be IT-competent, you must be able to write computer programs.
- 3. The author of this passage compares data to gasoline.
- 4. It is NOT true that your PC cannot produce any information without data.
- 5. Data were traditionally known as numbers and letters.

B. Choose a, b, c, or d which best completes each item.

- 1. The technological revolution, founded on, has changed man's way of life.
 - a. businesses
 - b. education
 - c. computers
 - d. information
- 2. The main point of paragraph six is supported by

- a. exemplification b. explanation
- c. description d. reasoning
- 3. As we understand from the text, data are
 - a. reconstructed numbers that can be used efficiently
 - b. usable form of information
 - c. the raw facts from which information is derived
 - d. the end result of manipulated facts
- 4. The term used to describe the integration of computer technology and information processing is
 - a. information handling b. software
 - c. information technology d. data tech
- 5. A person whose job is mainly concerned with the use, manipulation, and dissemination of information is called
 - a. an office wunderkind b. a knowledge worker
 - c. a data expert d. an info being

C. Answer the following questions orally.

1. What does the term information society refer to?
2. According to the text, how does a cornucopia of information form?
3. What is the difference between a record and a file?
4. How does data processing help dermatologists?
5. How is the term 'information' defined in the text?

Part II. Language Practice

A. Choose a, b, c, or d which best completes each item.

1. allows people to interact with and use computers and have an understanding of IT issues.
 - a. Information technology competency
 - b. Information-based revolution
 - c. Information dissemination
 - d. Information society
2. updating involves adding, changing, and deleting file records.
 - a. Field b. File

- c. Database
- d. Record
- 3. In, the generation and dissemination of information become the central focus of commerce.
 - a. an internet
 - b. an information system
 - c. an intranet
 - d. an information society
- 4. Interconnected computing hardware, including processors, storage devices, input/output devices, and communications equipment comprise
 - a. the computer network
 - b. the computerese
 - c. the computer system
 - d. the computer literacy
- 5., a relatively permanent file, contains all the existing records for a given application.
 - a. File management system
 - b. Fixed storage
 - c. Filmed output
 - d. Master file

B. Fill in the blanks with the appropriate form of the words given.

1. Compute

- a. Great gains have been made in the development of hardware and software.
- b. Desirable features of analog and digital machines are sometimes combined to create a hybrid system.
- c. The banking industry has become more and more
- d. It is a fact that humans cannot as fast as computers.
- e. The computer can interpret and execute programmed commands for input, output,, and logic operations.

2. Produce

- a. Plotters are used to permanent copies of graphic output.
- b. Dark characters on a bright background can by certain screens.
- c. Computers are used to control mechanical operations in the auto industry so as to increase

3. Collect

- a. You can be an intelligent consumer of computers and computer

- equipment, called hardware.
- b. Software refers to a set of instructions, called programs.
- c. Data during noise-level testing of automobiles include digitized versions of the actual sounds heard within the car.

4. Technology

- a. In this book you will learn those terms and phrases that not only are the foundation of computer but also are very much a part of everyday conversation at school, home, and work.
- b. This is a age.
- c. New surgical are being tried all the time.
- d. speaking, this procedure has some advantages over that one.
- e. It is difficult to say which country is superior in terms of space equipment.
- f. Her speech was too for most people to understand.

5. Record

- a. Information on disks can be accessed much faster than information recorded on tapes.
- b. A database management package derives much of its power from the ease with which it can sort, and search for answers to a wide range of questions.

C. Fill in the blanks with the following words.

components	representation	provide	organized
information	specific	mean	numeric
meaning			

The word data is used to indicate a/an of facts necessary for communicating items of meaning. These facts can be represented as, alphabetic, or alphanumeric data. They are the basic that are processed by the computer to produce Although the term information is sometimes used to data, it also has a more specific Information refers to data that has been into some coherent pattern and processed to some specific format.

D. Put the following sentences in the right order to form a paragraph. Write the corresponding letters in the boxes provided.

- a. Examples are robots used in defense to handle underwater military missions.
- b. With the age of the computer has arrived the age of the robot.
- c. Clearly, these signal the end of jobs for many factory workers—a troublesome social problem.
- d. These are not vaguely human-shaped robots, but rather information machines with the manual dexterity to perform tasks too unpleasant, or too dangerous to assign to human beings.

1	2	3	4

Section Two: Further Reading

Personal Computers

In 1981, IBM introduced its **IBM PC** and it legitimized the personal computer as a business tool. Shortly after that, other manufacturers began making PCs that were 100% compatible with the IBM PC; that is, they basically worked like an IBM PC. Most of today's personal computers (over 80%) evolved from these original PC-compatibles. Long removed from the IBM PC, they are also called **Wintel PCs** because they use the Microsoft *Windows 9x/NT/2000* (a collective reference to Microsoft *Windows 95*, *Windows 98*, *Windows NT*, or *Windows 2000*) control software and an Intel-Corporation or Intel-Compatible processor. Each of the Microsoft Windows 9x/NT/2000 family of **operating systems** controls all hardware and software activities on Wintel PCs.

The Wintel PC represents the dominant PC platform. A **platform** defines a standard for which software is developed.

Conventional PCs: Pockets, Laptops, Desktops, and Towers

Conventional personal computers have a full keyboard, a monitor, and can function as stand-alone systems. These PCs can be categorized as *pocket PCs*, *laptop PCs*, *desktop PCs*, and *tower PCs*.

Pocket and Laptop PCs. **Pocket PCs** and **laptop PCs** are light (a few ounces to about eight pounds), compact, and are called 'portable' because they have batteries and can operate with or without an external power source. The pocket PC, sometimes called a **palmtop PC**, literally can fit in a coat pocket or a handbag. Laptops, which weigh from three to eight pounds, often are called **notebook PCs** because they are about the size of a one-inch-thick notebook.

The power of a PC may not be related to its size. A few laptop PCs can run circles around some tower PCs. Some user conveniences, however, must be sacrificed to achieve portability. For instance, input devices, such as keyboards and point-and-draw devices, are given less space in portable PCs and may be more cumbersome to use. This is particularly true of pocket PCs, in which miniaturized keyboards make data entry and interaction with the computer difficult and slow. The display screen on some pocket PCs is monochrome and may be difficult to read under certain lighting situations. Portable computers take up less space and, therefore, have a smaller capacity for permanent storage of data and programs. Laptop battery life can be as little as a couple of hours for older models to 20 hours for state-of-the-art rechargeable lithium batteries.

The 2-in-1 PC can be used as both a notebook and a desktop PC. It has two parts: a fully functional *notebook PC* and a **docking station**. Two-in-one PCs have a configuration that allows users to enjoy the best of both worlds—portability and the expanded features of a desktop. The notebook, which supplies the processor, is simply inserted into or removed from the docking station, depending on the needs of the user. The docking station can be *configured* to give the docked notebook PC the look and feel of a desktop PC. That is, the docking station can expand the notebook's capabilities and

might include more disk storage, a CD-ROM drive, several interchangeable disk options, a full-size keyboard, a large monitor, and expansion slots into which still other features can be added to the system (for example, circuitry that would enable television programming to be viewed on the PC's monitor). Usually, docking stations provide a direct link to the corporate network.

Another notebook option, called the **port replicator**, works like the docking station in that the notebook PC is inserted into it and removed as needed. Once inserted the notebook can use the port replicator **ports** and whatever is connected to them. Ports are electronic interfaces through which devices like the keyboard, monitor, mouse, printer, and so on are connected. Port replicators also provide bigger speakers and an AC power source, and some include a network connector.

Desktop and Tower PCs. Desktop PCs and tower PCs are not considered portable because they rely on an outside power source and are not designed for frequent movement. Typically, the desktop PC's monitor is positioned on top of the processing component. The processing component of the tower PC is designed to sit upright, like a desktop PC's processing component standing on its end. The taller towers (over two feet) are usually placed beside or under a desk, and the smaller mini-tower may be placed in any convenient location (on a nearby shelf, on the desk, or on the floor).

Of the two, the tower has emerged as the most popular, primarily because it has a smaller *footprint* (the surface space used by the unit). The laptop which costs about twice that of a comparable tower PC, is gaining ground. About one in three PCs sold are laptops.

The Extended PC Family: Slate PCs, PDAs, and NCs

The conventional members of the PC family have several unconventional cousins. These personal computers may be designed for special applications or for use in a particular computing environment.

Slate Computers. Mobile workers in increasing numbers are using portable **slate PCs**. Slate PCs, sometimes called **pen-based PCs**, use electronic pens in conjunction with a combination monitor/drawing pad

instead of keyboards. Users select options, enter data, and draw with the pen. United Parcel Service (UPS) couriers use slate PCs when they ask you to sign for packages on a pressure-sensitive display screen with an electronic stylus.

Slate computers are poised to make an entry into the world of many mobile professionals. Handwritten text is interpreted by handwriting-recognition software, then entered into the system. **Speech-recognition** software, which allows the user to enter spoken words into the system, is being integrated into high-end slate PCs. Insurance agents and claims adjusters who need to work at accident or disaster scenes have found slate computers more suitable to their input needs, which may include both text and drawings.

Personal Digital Assistants. **Personal digital assistants (PDAs)**, or **handheld PCs**, may take on many forms and are called by many names, from *connected organizers* to *personal communicators* to *mobile business centers* to *Web phones*. PDAs are smaller than slate PCs, usually weighing less than half a pound. They can include a built-in cellular phone that enables the wireless sending/receiving of faxes and access to the Internet (including e-mail). Their built-in wireless communications capabilities give their users immediate access to the Internet, colleagues and clients, and needed information, virtually anytime, anywhere. PDA interaction can be via the pen (like a slate PC) or by touching the keys on an on-screen keyboard or a reduced-key keyboard.

Generally, PDAs support a variety of **personal information management** systems. A **PIM** might include appointment scheduling and calendar, e-mail, fax, phone-number administration, to-do lists, tickler files, 'Post-it' notes, diaries, and so on. Some PDAs can support a variety of PC-type applications, such as spreadsheets and personal financial management. Also, PDAs are designed to be easily connected to other computers and printers for data transfer, network access, and printing.

Network Computers. In contrast to the conventional PC, the **network computer**, or **NC**, is designed to function only when it is linked to a server computer (normally an organization's internal network of computers). The NC looks similar to a PC but with several major configuration differences. First, it has a relatively small processor and considerably less RAM than

modern personal computers. Second, it does not have a permanently installed disk. And, of course, it is less expensive than a stand-alone PC.

Workstations: The Hot Rods of Computing

What looks like a PC but isn't? It's a *workstation* and it's very fast. Speed is one of the characteristics that distinguishes workstations from PCs. In fact, some people talk of workstations as 'souped-up' PCs. The PC was fine for word processing, spreadsheets, and games, but for real 'power users'—engineers doing **computer-aided design**, or **CAD** (using the computer in the design process), scientists and researchers who do a lot of 'number crunching', graphics designers, multimedia content developers, and so on—the PC sometimes falls short.

The workstation's input/output devices also set it apart from a PC. A typical workstation will sport a large-screen color monitor capable of displaying high-resolution graphics. **Resolution** refers to the clarity of the image on the monitor's display. For pointing and drawing, the workstation user can call on a variety of specialized point-and-draw devices that combine the precision of a gun sight with the convenience of a mouse. Add-on keypads can expand the number of specialized function keys available to the user.

(Larry & Nancy Long: pp. 18-25)

Comprehension Exercises

A. Choose a, b, c, or d which best completes each item.

1. Which statement is NOT true?
 - a. IBM PC was introduced and legitimized in 1981.
 - b. Wintel PC is a personal computer using a Microsoft Windows operating system in conjunction with an Intel or Intel-Compatible micro-processor.
 - c. PCs made by other manufacturers were not wholly compatible with the IBM PC.
 - d. Most of today's personal computers have evolved from the original PC-compatibles.
2. A 2-in-1 PC is in two parts, a fully functional notebook PC and

- a. a slate
 - b. a port hole
 - c. a runway
 - d. a docking station
3. We may infer from the text that the docking station
- a. is a device into which a notebook PC is inserted to give the notebook PC expanded capabilities
 - b. is burdensome and reduces the capabilities of the PC
 - c. can give the notebook PC, the configuration of a desktop PC but does not allow the expanded features of a desktop
 - d. may not provide a direct link to the corporate network
4. Which statement is NOT true?
- a. Personal digital assistants are handheld personal computers that support a variety of personal information systems.
 - b. Slate PCs enable input via an electronic pen in conjunction with a pressure-sensitive monitor/drawing surface.
 - c. Network computers have high permanent storage capacity and are designed to work with a server computer.
 - d. Network computers, in contrast to the conventional PCs, do not function unless they are connected to servers.
5. We may conclude from the text that a workstation is
- a. a large computer that can service many users simultaneously in support of enterprise-wide applications
 - b. a high-performance single-user computer system with sophisticated input/output devices that can be easily networked with other workstations or computers
 - c. a televisionlike display for soft-copy output in a computer system
 - d. an output peripheral device that can project the screen image on a large screen for group viewing

B. Write the answers to the following questions in the spaces provided.

1. What determines the power of a computer?

.....
.....

2. What controls the hardware and software activities on Wintel PCs?

.....
.....
3. Explain the platform.
.....
.....

4. What distinguishes the port replicator from the docking station?
.....
.....

5. What are ports?
.....
.....



Section Three: Translation Activities

A. Translate the following passage into Persian.

Groceries Online

'Smart Shopping for Busy People' is Peapod's slogan. Peapod, a grocer on the Internet, has made life easier for a great many people. Although Peapod is not yet national in scope, it is giving us a glimpse into the future of retailing—the *virtual store*. Peapod is a pioneer in a rapidly expanding industry that is dedicated to enabling us to buy almost anything from our PCs. Peapod subscribers go shopping at the virtual grocery store by logging on to the Peapod site on the Internet. Once online, they can shop interactively for grocery items, including fresh produce, deli, bakery, meat, and frozen products. Rather than running from aisle to aisle, you simply point and click around the screen for the items you want.

Peapod's online shopping system is linked directly to its partner stores' computer systems (for example, Safeway in San Francisco and Jewel in Chicago). When you send your shopping list to Peapod, an order is

transmitted to the nearest partner store. A professionally trained shopper takes your order, grabs a shopping cart, and does your shopping for you. The professional shopper takes a fraction of the time you would take because the list is ordered by aisle and the shopper knows exactly what to get. You can redeem your coupons when the shopper/delivery person arrives with your food. This is one of many interactive online approaches to shopping that can help take the hassle out of shopping.

B. Find the Persian equivalents of the following terms and expressions and write them in the spaces provided.

1. competency
2. computer-aided design
3. configure
4. controversial
5. desktop PC
6. docking station
7. footprint
8. handheld PC
9. information society
10. information technology
11. knowledge worker
12. laptop PC
13. master file
14. network computer
15. notebook PC
16. operating system
17. palmtop PC
18. pen-based PC
19. personal digital assistant
20. personal information management
21. pocket PC
22. point-and-draw device
23. port replication
24. pressure-sensitive display

25. record	.....
26. reduced-key keyboard	.....
27. representation	.....
28. resolution	.....
29. slate PC	.....
30. speech-recognition software	.....
31. stand-alone PC	.....
32. stylus	.....
33. tower PC	.....
34. united parcel device	.....
35. Web phone	.....
36. workstation	.....

Unit 2

Section One: Reading Comprehension

Popular Productivity Software: Word processing

At work, at home, at school, and even during leisure activities, we spend much of our time writing. At work we send e-mail and write procedures manuals. At home we keep to-do lists and prepare party announcements. At school we write reports and essays. During leisure time, we keep diaries, write letters to our family and friends, and prepare newsletters for our club associations. These are just a few of the many day-to-day writing activities that can be made easier and more presentable through the use of word processing software. Today's sophisticated *word processing software* packages do much more than text-oriented word processing. For example, popular packages, like Microsoft Word and WordPerfect, not only let you integrate images with text for *printed documents*, but they let you integrate audio, such as voice annotations, and even video within documents designed for *on-screen viewing*.

Word Processing Concepts and Features

Word processing software lets us create, edit, and format documents in preparation for output. Output can be a document that is printed, displayed on a monitor, faxed, e-mailed, or perhaps, posted to the Internet for worldwide access. If you were to use word processing to prepare a report, you would key in the full draft only once. Revisions and corrections are made to a computer-based file before the finalized report is printed or output in some other way. If you forget a word or need to add a paragraph, you do not have to retype a page or, in the worst case, the whole report. Word

processing is a lot more than an automated pen and paper. It checks your grammar and spelling, helps you find the right word, and assists you in formatting your document (margins, typeface, headings, and so on). You, however, must supply the words and images.

Creating and Saving a Document. You'll probably learn the process and techniques of preparing a word processing document in a lab or, perhaps, via interactive computer-based training. To create an original document, such as a résumé, you simply begin entering text from the keyboard and, as needed, enter format commands that enhance the appearance of the document when it is printed or displayed (spacing, italics, and so on). You can insert images, then resize and/or reposition them anywhere within the word processing document. If you wish to work with the document later, you will need to save it to disk storage for later recall. When you recall a document from disk storage, you can *edit* (revise) it, then save the revised version of the document to disk storage. Once you are satisfied with the content and appearance of the document, you are ready to print, send, or display it.

Formatting a Document. You format a word processing document by specifying what you wish the general appearance of the document to be when it is printed. Typically, the preset format, or *default settings*, fit most word processing applications. For example, the size of the output document is set at letter size (8½ by 11 inches); the left, right, top, and bottom margins are set at 1 inch; tabs are set every ½ inch; and line spacing is set at 6 lines per inch. The default font might be 12 point Arial. Arial is one of dozens of available **typefaces** you can use in documents. A typeface refers to a set of characters of a particular design. A **font** is described by its typeface, its height in points (8, 10, 14, 24, and so on; there are 72 points to the inch), and its presentation attribute (roman [or normal], **bold**, *italic*, underline, and so on). If you are planning a three-column newsletter or would prefer something other than the defaults, you would want to revise the format specifications.

What You Can Do With Word Processing: The Features Package

Typically, text is entered in a word processing or other type of document via *keyboard* or *speech recognition*. In speech recognition, you simply speak into a microphone and the words are interpreted by speech-recognition

software and entered in the document. Word processing packages are **WYSIWYG** (pronounced 'WIZ e wig'), short for "What you see is what you get." What you do to a document, whether entering text or inserting an image, is reflected on the screen showing you what the document will look like when it is printed. Word processing software has many features that help you create exactly what you want.

The word processing *find* feature lets us search our entire word processing document and identify all occurrences of a particular search string. For example, when you could find (search) for 'January', the cursor is placed at the first occurrence of 'January'. The *replace* feature enables replacement either selectively or globally. For example, you can replace any or all occurrence of 'January' with 'February'.

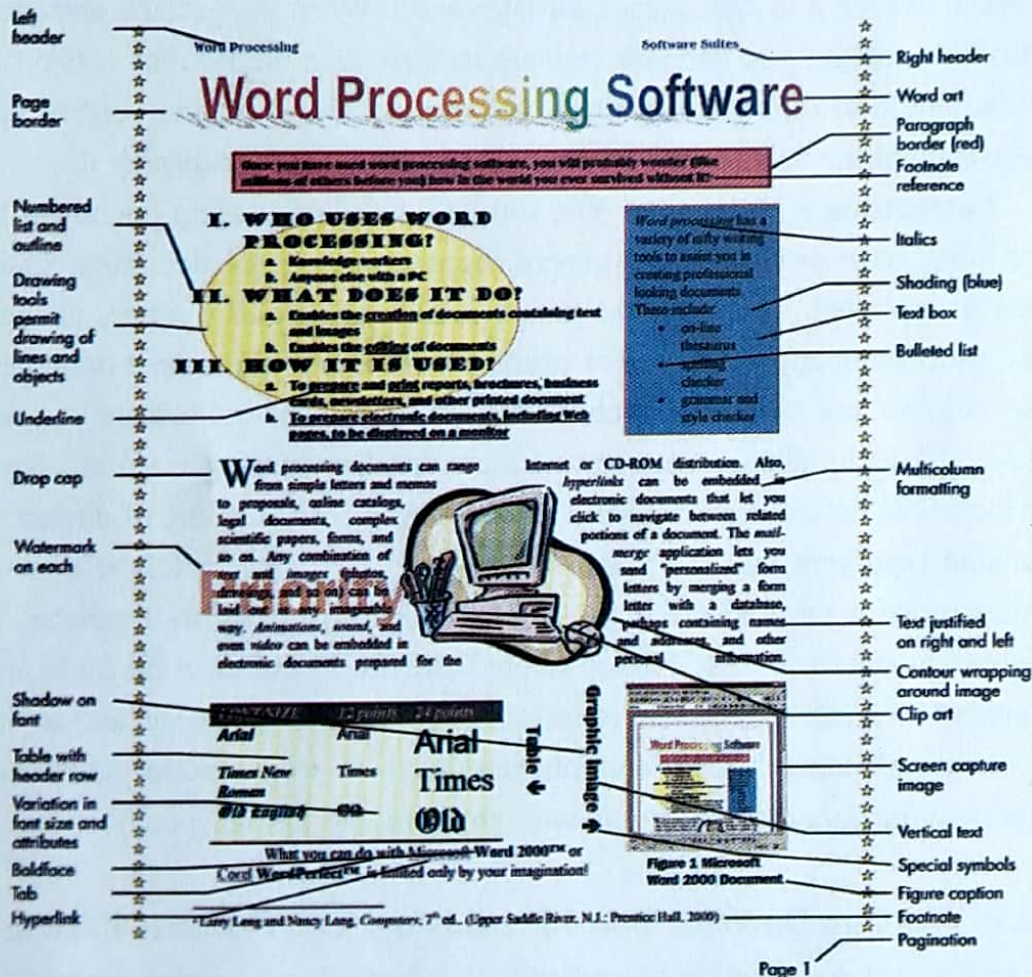


Figure 2-1. Word Processing Features Overview. This word processing document illustrates features common to most word processing software. Note that you can create special effects with the *drawing tool* and *border* features.

The *watermark* feature lets you add a drawing, a company logo, headline-sized text (such as the 'PRIORITY' in this example), or any image behind the printed document text. In the electronic world, documents are 'networked' with hyperlinks (references to different sections of an electronic document or to other related electronic documents). Even the *callouts*, which label the features, are a word processing feature. Not shown is the *editing* feature that lets you add editorial remarks and make corrections to an original document. This feature is helpful when several people review a document prior to publication.

Writing Tools: Dotting the i's and Crossing the t's

Word processing programs offer several helpful writing tools.

- *Spelling Checker*. The **spelling checker** checks every word in the text against an **electronic dictionary** and alerts you if a word is not in the dictionary. Some systems automatically correct misspelled words as they are entered.

- *Thesaurus*. Most commercial word processing packages have an **on-line thesaurus** to help you find the right word.

- *Grammar and Style Checkers*. A **grammar and style checker** highlights grammatical concerns and deviations from conventions.

Printing a Document or Sending an E-Mail or Fax. To print a document, ready the printer and select the *print* option on the main menu. If your PC is configured with a fax modem or you have a link to a local area network, you can e-mail or fax your word processing document as easily as you would print it. Upon selecting the e-mail or fax option, you are asked to enter the e-mail address or a fax telephone number. The software then makes the necessary communications link and sends the document.

(Larry & Nancy Long: pp. 52-56)

Part I. Comprehension Exercises

A. Put "T" for true and "F" for false statements. Justify your answers.

- 1. Modern word processing packages let you integrate audio, such as voice annotations, and video within documents designed for on-screen viewing.
- 2. Word processing software checks spelling, grammar, and supplies images.

- 3. Word processing lets us revise documents before and after being stored.
- 4. An online thesaurus can be used to suggest synonyms for a word in a word processing document.
- 5. Word processing software does not always help you create exactly what you want.

B. Choose a, b, c, or d which best completes each item.

1. Preset format specifications are referred to as
 - a. concrete settings
 - b. loading procedure
 - c. default settings
 - d. menu choosing
2. Which statement is NOT true?
 - a. Texts can be entered in a word processing document via keyboard.
 - b. Texts cannot be entered in a word processing document via speech.
 - c. In speech recognition, words are interpreted by speech-recognition software.
 - d. In speech recognition, words enter the document after being interpreted.
3. Word processing writing tools include all of the following except
 - a. spelling checker
 - b. thesaurus
 - c. electronic pencil
 - d. grammar and style checker
4. Which of these terms is NOT normally associated with the default settings on word processing software?
 - a. Merge sequence
 - b. Document size
 - c. Margins
 - d. Font
5. It can be concluded from the passage that
 - a. having been stored, a document cannot be revised
 - b. a newsletter may include text columns, shaded sidebars, embedded images, headings, a variety of fonts, but not much more
 - c. some modern word processing packages are not WYSIWYG

B. Fill in the blanks with the appropriate form of the words given.

1. Integrate

- a. Some computer manufactures have both input and output devices into one terminal.
- b. The success of any computer system depends on the of all its parts to form a useful whole.
- c. The area needed for a computer installation has been reduced by input and output devices into one peripheral.

2. Document

- a. A programmer should his work so that other programmers can understand it.
- b. It took the programmer one week to complete the of the programs in the new system.
- c. The payroll package we purchased is very well
- d. The preparation of that describe such things as the system, the programs prepared, and the changes made at later dates is referred to as documentation.

3. Appear

- a. The first calculating machine in 1920.
- b. The of new microcomputer systems on the market has increased the competition, forcing the prices down.

4. Recognize

- a. Optical-mark is sometimes called 'mark sensing' because a machine senses marks on a piece of paper.
- b. As a student, you may immediately this approach as a technique used to score tests.
- c. Hollerith cards are by the cut right edge.

5. Plan

- a. To is to decide in advance on a course of action.
- b. involves making decisions about short- and long-term goals and about the procedures and controls needed to achieve these goals.
- c. Many organizations have developed an MIS master to allocate and control information resources.

C. Fill in the blanks with the following words.

endless

packages

computing

processing

online

database

browser

contribution

Personal computing encompasses everything from 3-D games, to going, to computer-based education, to music composition. A seemingly number of software packages adds variety to the personal experience. However, over the history of personal computing, word software, desktop publishing software, presentation software, spreadsheet software, software, and, more recently, Internet software and graphics software have formed the foundation of personal computing. Software in these categories have won unanimous user acceptance because of their tremendous to personal productivity.

D. Put the following sentences in the right order to form a paragraph. Write the corresponding letters in the boxes provided.

- a. The database file contains records for each member, which are made up of related fields.
- b. Winnie Winnowski created the database file by entering new member information into the PC User's Group member database, actually a word processing table with rows and columns.
- c. Each record has eleven fields, each of which is described in its field name at the top of the database display.
- d. She then used a sort feature to select only the new members from the database.
- e. This database file is merged with the form file (the letter) to generate the personalized letters.

1	2	3	4	5

Putting Word Processing to Work

Word processing is extremely versatile, offering you a wide range of capabilities. Here are a few more applications for word processing. You will find many more as you gain experience with this, the most used of all software applications.

Merging Documents With a Database

Word processing software allows you to merge data in a database with the text of a document. The most common use of this capability is the *mail-merge* application. Winnie Winnowski, the president of the PC User's Group decided to send personalized letters to the club's new members. To do so, Winnie created a *form letter* file. The form letter contains references to entries in a *database file*, a separate word processing file containing a table. She then used the *merge* feature to combine the information in the table with the form letter to generate separate letters for each new member, thus producing the 'personalized letters'.

The mail-merge example is a good illustration of the use of **boilerplate**. Boilerplate is existing text that can be reused and customized for a variety of word processing applications. One nice feature of word processing is that you can accumulate documents on disk storage that eventually will help you meet other word processing needs. You can even *buy* boilerplate (for example, text for business letters). The legal profession offers some of the best examples of the use of boilerplate. Simple wills, uncontested divorces, individual bankruptcies, real estate transfers, and other straightforward legal documents may be as much as 95% boilerplate. The use of boilerplate is common in all areas of business, education, government, and personal endeavor.

Integrating Charts With Documents

The word processing *chart* feature lets you generate a variety of charts from spreadsheet-like data in a Microsoft Word 2000 *datasheet*. Figure 2-2 shows

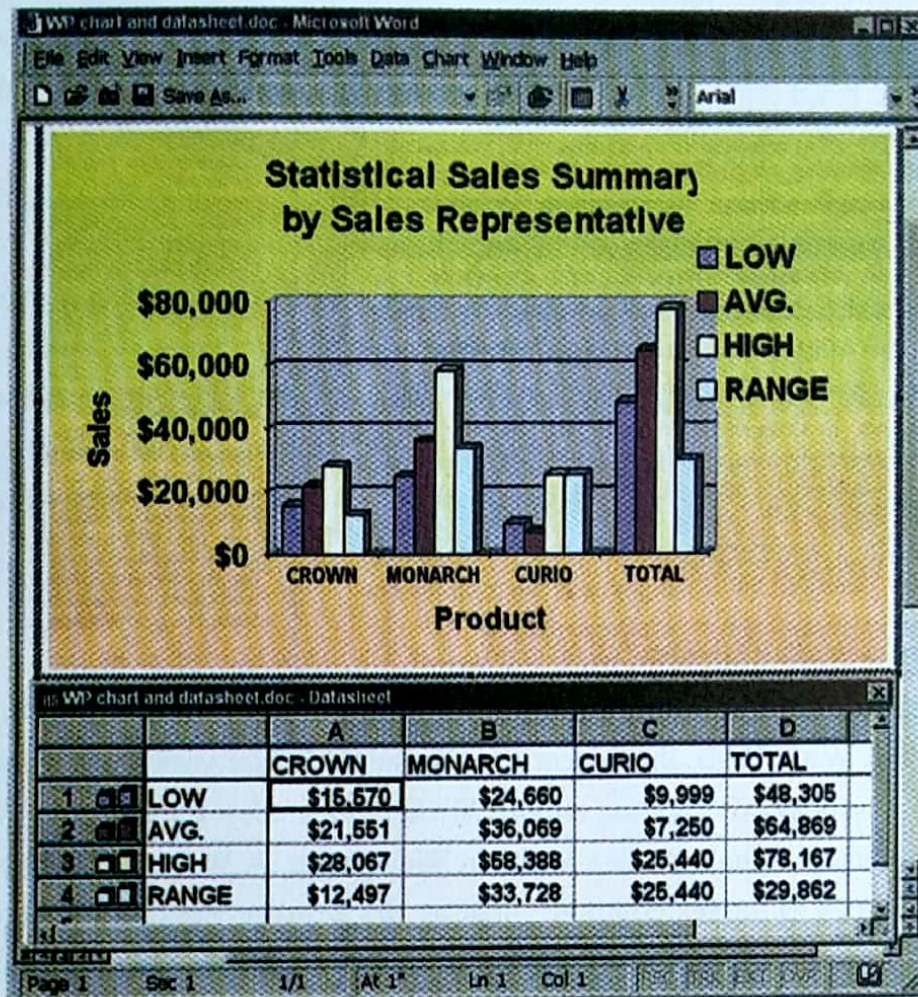


Figure 2-2. Word Processing Table and Chart. The word processing *chart* feature makes it easy to generate professional looking charts within documents.

how the information in a 'Statistical Sales Summary' datasheet can be dynamically graphed within a word processing document. The bar graph in Figure 2-2 was created automatically from the data in the datasheet. Once data have been entered into the datasheet, you can change values and observe their effect on the chart.

Embedded Hyperlinks

Not all word processing documents are designed to be printed. For example, many companies are opting to put their reference materials in electronic, rather than printed, documents. Electronic versions of product catalogs,

procedures manuals, personnel handbooks, and so on are now common in the business community. They are easier to create, maintain, and distribute. One of the main reasons for this trend toward online documents is the ability to place **hyperlinks** in documents.

Hyperlinks let you tie parts of a document or different documents together. Words or phrases within documents can be highlighted as hyperlinks. When you encounter a hyperlink entry, you can jump (link) to another place in the same document or to another document on your PC's hard disk, on a local area network, or on the Internet for more information. In Windows-based programs, hyperlinks usually are displayed in a color (often blue or green) and underlined. Hyperlinks make it easy to skip around within or between documents to find what you want.

Creating Web Pages

If you can create a word processing document, you can create a Web page on the **World Wide Web**, the primary application used for viewing information on the Internet. Information on **the Web**, which may be graphics, audio, video, animation, and text, is viewed in **Web pages**. A Web page is retrieved from an Internet server computer, just as the word processing document is retrieved from a PC's hard disk. To a large extent, the explosion of information made available over the Internet can be attributed to the fact that word processing software lets users save documents in a format compatible with transmission over the Internet's World Wide Web. Now, anyone with word processing skills can contribute to the wealth of information on the Internet. What you see in a word processing document is essentially what you would see when viewing it as a Web page on an Internet browser.

(Larry & Nancy Long: pp. 56-58)

Comprehension Exercises

A. Choose a, b, c, or d which best completes each item.

1. The word processing *form letter* contains references to entries in

.....

- a. a document file
- c. a database file

- b. a thesaurus
- d. a Web page

2. Winnie Winnowski is known for using capability of word processing software to send personalized letters to all the new members of her club.
- a. the mail merge
 - b. the hyperlink
 - c. the database
 - d. the spreadsheet
3. Which statement is NOT true?
- a. Boilerplate is existing text that can in some way be reused and customized for a variety of word processing applications.
 - b. The use of boilerplate is common in all areas of business, education, government, and personal endeavor.
 - c. In Microsoft Word 2000, data are entered into a datasheet.
 - d. The data in the Word datasheet cannot be presented in charts.
4. Hyperlinks
- a. have been important in the trend of online documentation
 - b. let you link to other parts of a document or to different documents together within a computer system or on the Internet
 - c. make it easy to tie parts of a document or different documents together
 - d. all of the above
5. It is true that
- a. different documents can be tied together by cybertext links
 - b. boilerplates cannot be customized
 - c. information on the Web is retrieved from hard disks
 - d. information on the Web is viewed in Web pages

B. Write the answers to the following questions in the spaces provided.

1. How does the merge feature of word processing software help us produce personalized letters?

.....
.....

2. How can a Web page be compared to a word processing document?

.....
.....

3. How does word processing software contribute to availability of information on the Internet?

.....
.....

4. What helps companies put their reference materials in electronic documents?

.....
.....

5. What are some of the advantages of electronic documentation?

.....
.....



Section Three: Translation Activities

A. Translate the following passage into Persian.

E-Mail Etiquette

As a knowledge worker, you may spend an hour or more each day composing or responding to e-mail. E-mail is now as much a part of the business world as the paycheck. How we present ourselves in our e-mails can play a role in how effective we are in business and what people think of us. You can leave a good or bad impression with your correspondents depending on *what* you say in your message and *how* you say it. During face-to-face conversations we use vocal inflections or body movements that clarify words or phrases. E-mail is just words, leaving the door open for misinterpretation of our intended message. Anyone composing e-mail should be aware that it's electronic and could be easily forwarded, printed, and even broadcast to others. Broadcasting sensitive information could be very embarrassing to you and to others. Every e-mailer should be careful what he or she writes and follow the basic tenets of e-mail etiquette. For example, you should inform senders when forward their e-mail. A good e-mail

message includes a subject, has a logical flow, and concludes with a signature (name, association, and contact information).

B. Find the Persian equivalents of the following terms and expressions and write them in the spaces provided.

1. announcement
2. boilerplate
3. browser
4. club association
5. computer-based file
6. concept
7. database
8. default settings
9. display
10. embedded hyperlink
11. feature
12. font
13. format
14. form letter file
15. heading
16. interactive computer-based training
17. mail-merge application
18. margin
19. merge
20. online thesaurus
21. on-screen viewing
22. presentable
23. procedure
24. sophisticated
25. typeface
26. word processing

Unit 3

Section One: Reading Comprehension

Popular Productivity Software: Desktop Publishing

Word processing can handle just about any document generation task, but some people need to produce documents with complicated layouts and documents that are ready to be printed professionally. For these people, the application of choice is *desktop publishing*. Instead of being tied to the typesetter and a commercial print shop, millions of users now create newsletters, brochures, user manuals, pamphlets, flyers, restaurant menus, periodicals, greeting cards, graduation certificates, and thousands of other printed and published items. Desktop publishing refers to the capability of producing *camera-ready documents* (ready to be printed professionally) from the confines of a desktop. The resulting documents are then reproduced by a variety of means, from duplicating machines to offset printing (a commercial printing process used for high-volume printing). The files/documents resulting from desktop publishing are compatible with hardware used in offset printing. Desktop publishing software can help you produce every conceivable type of printed matter, from business cards to catalogs, and is changing the way organizations and individuals meet their printing needs.

Desktop Publishing and Word Processing: What's the Difference?

Both desktop publishing and word processing software assist you in creating documents, but the end result and the way you get there can be quite different. In word processing, the emphasis is on *words*, the text that makes up the documents. In word processing, we fill the document with words, then add images, borders, shading, and so on around the running text. The text

runs from the beginning to the end of the letter, handbook, or whatever document is being created. In desktop publishing, the emphasis is on overall *document composition*. Various types of *objects* are pulled together and laid out on a page. An object can be a block of text, an image, a border, an area of shading, and so on. Desktop publishing's page layout capabilities, combined with its precision, have made desktop publishing the choice of professional designers of publication materials.

Creating and editing text within a desktop publishing program can be cumbersome, so most seasoned desktop publishers prepare their text using word processing software. Once the page layout is established, the text is *copied* (from the word processing document) and *pasted* (inserted) into the desktop publishing document at the appropriate location. Both desktop publishing and word processing allow you to save documents in a format compatible with the World Wide Web.

Desktop Publishing Concepts and Features

The quality of the desktop publishing-produced output depends on the quality of available input and output devices. The typical office will have hardware (scanners, printers, and so on) that is sufficient for most printing needs; however, professional graphics studios with very high-resolution hardware are needed for some jobs.

Creating a document with desktop publishing software involves going through the *document-composition process*. This process involves integrating graphics, photos, text, and other resources into a visually appealing *document layout*.

Presentation Software: Putting on the Show

During the past decade, PC-based *presentation software* has replaced overhead projectors and carousel projectors as the presentation tool of choice whether at the lectern or the pulpit. Presentation software lets you create highly stylized images for group presentations, self-running slide shows (for example, PC-based information displays at trade shows), reports, and any other situation that requires the presentation of organized, visual information. The software, such as Microsoft PowerPoint 2000, gives you a rich

assortment of tools to help you create a variety of charts, graphs, and images and to help you make the presentation.

A progressive sales manager would never consider reporting a sales increase in tabular format on computer printout paper. A successful year that otherwise would be hidden in rows and columns of sales figures will be vividly apparent in a colorful PowerPoint bar graph. Those in other areas of business also want to 'put their best foot forward'. To do so, they use PC-based presentation software, often with an LCD projector, capable of projecting images onto a screen for all to see.

(Larry & Nancy Long: pp. 60-62)

Part I. Comprehension Exercises

A. Put "T" for true and "F" for false statements. Justify your answers.

- 1. Desktop publishing software enables users to produce camera-ready documents for reproduction.
- 2. Word processing software is used to produce documents with complicated layouts.
- 3. Users can create brochures, manuals, greeting cards, and thousands of other printed items using desktop publishing software.
- 4. Desktop publishing has changed the way organizations and individuals meet their printing needs.
- 5. Desktop publishing does not allow you to save documents in a format compatible with the World Wide Web.

B. Choose a, b, c, or d which best completes each item.

- 1. According to the text,
 - a. desktop publishing software allows users to produce near-typeset-quality copy for newsletters, advertisement, and many other printing needs, all from the confines of a desktop
 - b. desktop publishing software does not have the necessary capabilities of layout and document production
 - c. word processing publishing capabilities has made word process-

ing publishing the choice of professional designers of publication materials

d. word processing software, together with desktop publishing, emphasises on words

2. In desktop publishing,

a. various images and borders are added around the running text

b. various types of objects are pulled together and laid out on a page

c. creating and editing text is fast-moving and fluent

d. text is created and edited, then page layout is established

3. Which of the following is NOT a desktop publishing feature?

a. In desktop publishing, the emphasis is on overall document composition.

b. Text in a desktop publishing file usually is entered first in spreadsheet software then moved.

c. Generally, the text to be placed in desktop publishing document is prepared with a word processing program.

d. The quality of the desktop publishing-produced output depends on the I/O devices used.

4. As we understand from the text,

a. overhead projectors are still the best tools to present images

b. presentation software doesn't allow users to create images for use during presentation

c. some desktop publishing studios are equipped with very high-resolution hardware

d. in desktop publishing, typical hardware satisfies all printing needs

5. Which of the following is a commercial example of presentation software?

a. Microsoft Excel

b. Microsoft PowerPoint 2000

c. Lotus 1-2-3

d. Print House

C. Answer the following questions orally.

1. What advantages does desktop publishing software have over word processing software?

2. Why is overhead projector replaced by presentation software?

3. What does the process of document composition involve?

is needed for a quality

- b. The may use an image projector to project electronic slides onto a screen.
- c. PowerPoint's tri-pane view lets you view the slide, outline, and notes at the same time.
- d. PowerPoint 2000 helps you prepare and slides for presentation.

2. Create

- a. With presentation software you can a variety of charts from data imported from a spreadsheet or a database.
- b. A pattern used to facilitate the of a slide presentation is called a template.
- c. Graphics software is used for line drawings, art, and presentation graphics.
- d. A scalable typeface is an outline-based typeface from which fonts of any point size can be

3. Scan

- a. Optical recognition system's electronic read data and convert them to electrical signals, which are sent to the computer.
- b. A scanner hard copy and digitizes the text and/or images to a format that can be interpreted by a computer.

4. Project

- a. A proxima screen image projects electronic slides on to a screen for all to see.
- b. Transparency acetates and 35-mm slides were the presentation aids of choice for decades, but they now take a backseat to slide- hardware and software.
- c. An LCD projector is capable of images on a screen.

5. Result

- a. The linkage editor links systems routines to the object module. The program, referred to as the load module, is directly executable by the computer.
- b. The of these mathematical operations were obtained from the university mainframe.

C. Fill in the blanks with the following words.

prepare
attractive
satisfied

graphics
significant

publishing
components

The availability of desktop publishing systems should have a/an impact on the way most business documents are prepared. Desktop systems, a step up from word processing, can high-quality output, combining different print typefaces with and charts. Users can format these elements into page layouts. Instead of manually cutting and pasting page, the systems enable users to make and remake pages with ease until they are

D. Put the following sentences in the right order to form a paragraph. Write the corresponding letters in the boxes provided.

- a. At that time the concept was intertwined with its realization in two pieces of computer equipment: Apple's Macintosh, with its then-unique desktop-metaphor screen, and Apple's Laser Writer printer.
- b. This is an ideal microcomputer application—it's satisfying for those who do the work, and saves their companies time and money.
- c. The term 'desktop publishing' dates from the mid-1980s.
- d. Basically, it means using a microcomputer to prepare company reports, newsletters, pamphlets, advertising copy, and other printed material of professional quality.
- e. Now, Everyone has heard of desktop publishing.

1	2	3	4	5

* * *

Spreadsheet: The Magic Matrix

The spreadsheet, which is simply a grid for entering rows and columns of data, has been a common business tool for centuries. Before computers, the ledger (a book of spreadsheets) was the accountant's primary tool for keeping records of financial transactions. Instructors' grade books are also in spreadsheet format, with student names labeling the rows and quiz scores labeling the columns.

Spreadsheet software is an electronic alternative to thousands of traditionally manual tasks. We are no longer confined to using pencils, erasers, and hand calculators to deal with rows and columns of data. Think of anything that has rows and columns of data and you have identified an application for spreadsheet software: income (profit-and-loss) statements, personnel profiles, demographic data, home inventories, and budget summaries, just to mention a few.

Organization: Rows and Columns

Spreadsheets are organized in a *tabular structure* with *rows* and *columns*. The intersection of a particular row and column designates a **cell**. The rows are *numbered*, and the columns are *lettered*.

Data are entered and stored in a cell. During operations, data are referred to by their **cell address**, which identifies the location of a cell in the spreadsheet by its column and row, with the column designator first.

In the spreadsheet work area (the rows and columns), a movable highlighted area 'points' to the *current cell*. The current cell is highlighted with either a different background color or a dark border. This highlighted area, called the **pointer**, can be moved around the spreadsheet with the arrow keys or the mouse. The address and content of the current cell are displayed in the cell content portion of the spreadsheet above the work area. The content or value resulting from a formula of each cell is shown in the spreadsheet work area.

Ranges: Groups of Cells

Many spreadsheet operations ask you to designate a **range** of cells. These are *cell range* (a single cell); *column range* (all or part of a column of adjacent cells), *row range*; and *block range* (a rectangular group of cells). A particular range is indicated by the addresses of the endpoint cells separated by a colon, such as the row range C14:E14.

MONTHLY SALES SUMMARY-MARCH						
SALES SUMMARY BY REPRESENTATIVE						
NAME	REGION	CROWN	MONARCH	CURIO	TOTAL	COMMISSION
Rosco, R.	West	\$18,750	\$30,400	\$12,000	\$61,150	\$3,639.25
Mann, G.	West	18,558	58,388	0	76,946	\$5,107.85
Cox, B.	North	25,900	38,903	280	65,083	\$4,158.91
Taylor, A.	South	15,570	32,005	730	48,305	\$3,125.90
Allen, H.	East	22,460	32,055	5,050	59,565	\$3,681.15
Hill, P.	East	28,067	24,660	25,440	78,167	\$4,287.49
TOTALS		\$129,305	\$216,411	\$43,500	\$389,216	\$24,000.55
COMMISSION RATE		5.5%	7.0%	4.0%		

Figure 3-1. Spreadsheet Ranges. The highlighted cells in this spreadsheet illustrate the four types of ranges: cell (G12), column (A5:A10), row (C14:E14), and block (C5:E10).

MONTHLY SALES SUMMARY-MARCH						
SALES SUMMARY BY REPRESENTATIVE						
NAME	REGION	CROWN	MONARCH	CURIO	TOTAL	COMMISSION
Rosco, R.	West	\$18,750	\$30,400	\$12,000	\$61,150	\$3,639.25
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Cox, B.	North	25,900	38,903	280	65,083	\$4,158.91
Taylor, A.	South	15,570	32,005	730	48,305	\$3,125.90
Allen, H.	East	22,460	32,055	5,050	59,565	\$3,681.15
Hill, P.	East	28,067	24,660	25,440	78,167	\$4,287.49
TOTALS		\$129,305	\$216,411	\$43,500	\$389,216	\$24,000.55
COMMISSION RATE		5.5%	7.0%	4.0%		

Figure 3-2. Copying Formulas. The actual content of F5 is the formula in the cell contents box ($=C5+D5+E5$). The result of the formula (61150) appears in the spreadsheet at F5, formatted as currency (\$61,150). In creating

the spreadsheet template for the monthly sales summary, the national sales manager for BrassCo entered only three formulas (see cell contents summary below).

- The formula in F5 to sum the product sales for each salesperson was copied to the range F6:F10.
- The formula in G5: $=\$C\$14*C5+\$D\$14*D5+\$E\$14*E5$ to compute the commission for each salesperson was copied to the range G6:G10.
- The formula in C12: $=SUM(C5:C10)$ to sum the sales for each product was copied to the range D12:G12.

Viewing a Spreadsheet

In Windows 9x/NT/2000, one or more applications run in **windows**—rectangular areas displayed on the screen. Depending on the size of a window, the entire document may not be visible. Spreadsheets can be large, sometimes thousands of rows and dozens of columns (for example, an employee database). When document content is more than can be displayed in a window, the window is outfitted with **vertical** and/or **horizontal scroll bars**. Each bar contains a **scroll box** and **scroll arrows**. Use the mouse or keyboard to move a box up/down or left/right on a scroll bar to display other parts of the application. This movement is known as **scrolling**. Scrolling through a spreadsheet is much like looking through a magnifying glass as you move it around a newspaper page.

(Larry & Nancy Long: pp. 66-69)

Comprehension Exercises

A. Choose a, b, c, or d which best completes each item.

1. Spreadsheet software
 - a. has recently been introduced as a tool for entering rows and columns of data
 - b. permits users to work with rows and columns of data
 - c. is identical with the ledger
 - d. is identical with the template
2. Which statement is NOT true?
 - a. Spreadsheet software is an alternative to traditional manual tasks.

- b. Spreadsheet software has replaced the use of pencils and erasers to draw rows and columns of data.
 - c. The term spreadsheet brings a tabular structure to mind.
 - d. The term spreadsheet was coined at the beginning of the personal computer boom.
3. According to the text,
- a. the intersection of a particular row and column in a spreadsheet designates a cell
 - b. spreadsheet software works only with numbers but doesn't generate charts
 - c. data stored in a cell are not easily addressable
 - d. the column letter accounts for the content of the current cell
4. The passage contains information that would answer which of the following questions about spreadsheets?
- a. What are the major types of cell entries?
 - b. What are the spreadsheet templates?
 - c. How are the spreadsheet templates modified?
 - d. How are the ranges classified?
5. The spreadsheet pointer highlights
- a. the relative cell
 - b. the status cell
 - c. the current cell
 - d. the merge cell
6. Data in a spreadsheet are referred to by their cell
- a. box
 - b. address
 - c. code
 - d. number

B. Write the answers to the following questions in the spaces provided.

1. Name the ranges in a spreadsheet.

.....

2. What is called the current cell?

.....

3. What is scrolling?

.....
.....

4. What does the author compare scrolling to?

.....
.....

5. How does the size of a window affect the visibility of a document?

.....
.....



Section Three: Translation Activities

A. Translate the following passage into Persian.

Simulation by Spreadsheet

The story goes that Daniel Bricklin and Robert Frankston invented the spreadsheet program in response to Bricklin's frustrations with pencil-and-paper worksheets in business school. It's said that the authors were amazed by the success of their program (VisiCalc—a milestone in business use of the computer), and especially by the explanation for the success.

They invented a foolproof, superconvenient way of doing worksheet arithmetic and making changes when the numbers changed.

But their program was being bought and used mainly for another reason. Changing one or more numbers in the on-screen worksheet automatically changes all the related numbers in all the related worksheets in computer memory. This means that the spreadsheet program is a powerful tool for asking **what-if questions**.

For example, suppose a manufacturing company's management has been thinking about automating one of its factories. That will take capital. Raising capital costs money. How will that affect profit-and-loss statements over the next several years?

The step-by-step spreadsheet answer is: (1) add a new cell, labeled COST OF RAISING CAPITAL, to the block of cells labeled COSTS, and enter the sum it will cost to raise the needed capital; (2) the spreadsheet program automatically updates the company's TOTAL COSTS; (3) the spreadsheet program automatically updates the company's PROFIT.

Notice that the first of these three steps is the one that requires judgment. Management has to decide whether it's best for the company to raise capital by negotiating a bank loan, by selling company stock or bonds, or by some other means. The spreadsheet program does the arithmetic for each of these options. This gives management some of the information it needs for decision-making.

Another question is: Will the automation pay for itself, and if so when? To answer this, enter the expected lower labor costs in one of the cells labeled LABOR COSTS. Since the data in memory now include both the expense and the benefits of automation, the spreadsheet program is a **financial model** of the company's situation when and if it automates the factory. The program's instant update of the PROFIT cell is an instant simulation of the company's financial future if it chooses to automate.

B. Find the Persian equivalents of the following terms and expressions and write them in the spaces provided.

1. block range
2. budget summary
3. camera-ready document
4. cell range
5. column range
6. demographic data
7. desktop publishing
8. flyer
9. home inventory
10. income statement
11. layout
12. manual
13. matrix
14. paste

15. PC-based presentation software	.....
16. periodical	.....
17. personnel	.....
18. row range	.....
19. scroll arrow	.....
20. scroll bar	.....
21. scrolling	.....
22. self-running slide show	.....
23. simulation	.....
24. tabular structure	.....

Unit 4

Section One: Reading Comprehension

What Is Data Mining?

Data mining is a key member in the Business Intelligence (BI) product family, together with Online Analytical Processing (OLAP), enterprise reporting and ETL.

Data mining is about analyzing data and finding hidden patterns using automatic or semiautomatic means. During the past decade, large volumes of data have been accumulated and stored in databases. Much of this data comes from business software, such as financial applications, Enterprise Resource Management (ERP), Customer Relationship Management (CRM), and Web logs. The result of this data collection is that organizations have become data-rich and knowledge-poor. The collections of data have become so vast and are increasing so rapidly in size that the practical use of these stores of data has become limited. The main purpose of data mining is to extract patterns from the data at hand, increase its intrinsic value and transfer the data to knowledge.

You may wonder, why can't we dig out the knowledge by using SQL queries? In other words, you may wonder what the fundamental differences between data mining and relational database technologies are. Let's have a look at the following example

Figure 4-1 displays a relational table containing a list of high school graduates. The table records information such as gender, IQ, the level of parental encouragement, and the parental income of each student along with that student's intention to attend college. Someone asks you a question: What drives high school graduates to attend college?

You may write a query to find out how many male students attend

college versus how many female students do. You may also write a query to determine the impact of the Parent Encouragement column. But what about male students who are encouraged by their parents? Or female students who are not encouraged by their parents? You would need to write hundreds of these queries to cover all the possible combinations. Data in numerical forms, such as that in Parent Income or IQ is even more difficult to analyze. You would need to choose arbitrary ranges in these numeric values. What if there are hundreds of columns in your table? You would quickly end up with an impossible to manage number of SQL queries to answer a basic question about the meaning of your data.

File Edit View Insert Format Records Tools Window Help				
College Plans: Table				
Gender	Parent Income	IQ	Parent Encouragement	College Plans
Male	46580	100	Not Encouraged	No
Male	39687	121	Not Encouraged	No
Male	63482	160	Encouraged	Yes
Female	40454	129	Not Encouraged	No
Male	7333	36	Not Encouraged	No
Female	17817	105	Not Encouraged	No
Male	33540	110	Not Encouraged	No
Male	48171	107	Not Encouraged	Yes
Male	33356	79	Not	No
Male	73325	120	Encouraged	Yes
Male	33153	112	Not	No
Male	10331	94	Not	No
Female	35505	100	Not	Yes
Female	30052	76	Encouraged	Yes
Male	24579	105	Not	No
Male	37497	72	Not	No
Male	31572	98	Encouraged	No
Female	7979	138	Not	No
Female	11151	95	Not	No
Female	9532	86	Encouraged	No
Male	73580	124	Encouraged	Yes
Female	70149	104	Encouraged	No
Male	44316	122	Encouraged	Yes
Male	14915	100	Not	No
Male	52417	68	Encouraged	No
Datasheet View				

Figure 4-1. Student Table.

In contrast, the data mining approach to this question is rather simple. All you need to do is select the right data mining algorithm and specify the column usage, meaning the input columns and the predictable columns (which are the targets for the analysis). A decision tree model would work well to determine the importance of parental encouragement in a student's decision to continue to college. You would select IQ, Gender, Parent Income, and Parent Encouragement as the input columns and College Plans as the predictable column. As the decision tree algorithm scans the data, it analyzes the impact of each input attribute related to the target and selects the most significant attribute to split. Each split divides the dataset into two subsets so that the value distribution of College Plans is as different as possible among these two subsets. This process is repeated recursively on each subset until the tree is completely built. Once the training process is complete, you can view the discovered patterns by browsing the tree.

Figure 4-2 shows a decision tree for the College Plan dataset. Each path from the root node to a leaf node forms a rule. Now, we can say that students with an IQ greater than 100 and who are encouraged by their parents have a 94% probability of attending college. We have extracted knowledge from the data.

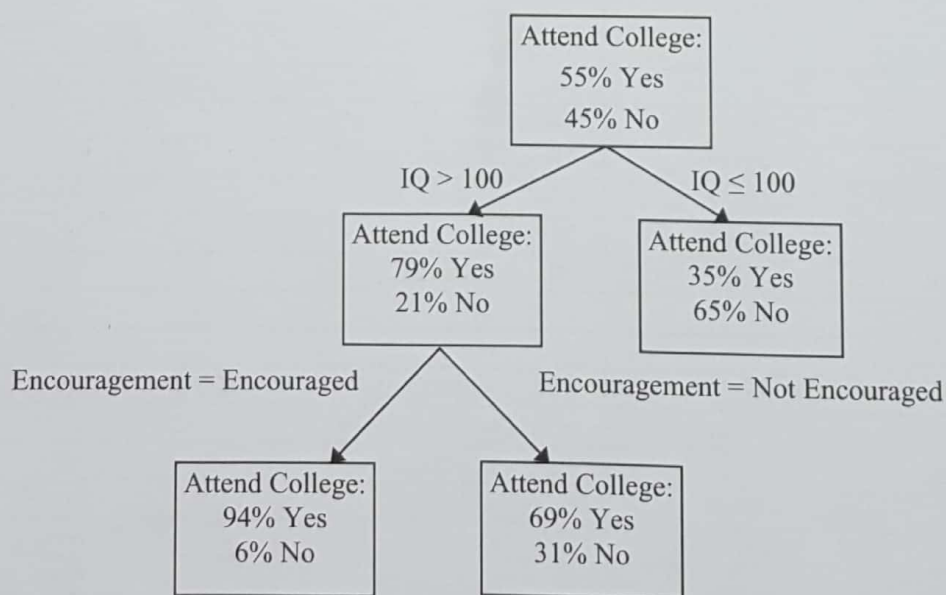


Figure 4-2. Decision Tree.

As exemplified in Figure 4-2, data mining applies algorithms, such as decision trees, clustering, association, time series, and so on, to a dataset and analyzes its contents. This analysis produces patterns, which can be explored for valuable information. Depending on the underlying algorithm, these patterns can be in the form of trees, rules, clusters, or simply a set of mathematical formulas. The information found in the patterns can be used for reporting, as a guide to marketing strategies, and, most importantly, for prediction. For example, based on the rules produced by the decision tree, you can predict with significant accuracy whether high school students who are not represented in the original dataset will attend college.

(Tang: pp. 1-20)

Part I. Comprehension Exercises

A. Put "T" for true and "F" for false statements. Justify your answers.

- 1. Accumulation of data has made it easy for organizations to solve their business problems.
- 2. The question posed at the end of paragraph four is an example of data transfer to knowledge.
- 3. Paragraph four gives an example of the database contents.
- 4. The decision tree shown in Figure 4-2 may not be considered an accurate way of data analysis.
- 5. Data mining applies algorithms to a database and analyzes its contents.

B. Choose a, b, c, or d which best completes each item.

- 1. Prior to data mining technology,
 - a. organizations were not capable of doing data analysis
 - b. data could not be used extensively by business organizations
 - c. organizations could not solve their daily business problems
 - d. data was just piled up in databases
- 2. We can infer from the text that
 - a. database technology is deficient in extracting knowledge from data in databases
 - b. students mostly prefer to attend college

- c. database technologies do not differ greatly from their data mining counterparts
 - d. high school graduates do not like to attend college
3. Paragraph five mainly discusses
- a. numerical data analysis
 - b. the difficulty of using database technology to answer a knowledge - based question
 - c. numerical data form
 - d. the difficulty of using SQL queries to determine the impact of parent encouragement on students
4. How is the topic sentence supported by the rest of the paragraph?
- a. through classification
 - b. through comparison and contrast
 - c. through explanation
 - d. through definition
5. Paragraph six mainly explains
- a. the process whereby the targets for data analysis are determined
 - b. the application of the data mining approach to analyze data and find the answer to the question posed in paragraph four
 - c. the rules whereby data mining algorithms are selected
 - d. the selection of the correct data mining algorithms for specific targets
6. It can be concluded from the text that the main purpose of mining is to
- a. classify the data in the database and use the classified data for prediction
 - b. reduce the user's task by applying automatic means to analyze data
 - c. deduce patterns from the data collected in the database and transfer the data to knowledge
 - d. analyze the data in the database and use the results as a guide to marketing strategies
7. The primary purpose of this passage is to
- a. trace the development of data mining
 - b. inform us of the role data mining can play in business
 - c. explain the rules governing the use of data mining
 - d. point out the influence of data mining on social issues

8. The author's attitude toward the data mining approach could best be described as one of
 - a. admiration
 - b. displeasure
 - c. compassion
 - d. mystery
9. The author implies that data mining
 - a. cannot be leveraged to solve daily business problems
 - b. is not going to be of benefit to marketing strategies
 - c. can automatically manage worldwide competition
 - d. is getting more and more attention in today's business

C. Answer the following questions orally.

1. How would you solve the problem of stiff competition, if you owned an enterprise?
2. As a specialist in data mining, how would you improve this technology?
3. Do you think that the key to business success is to retain existing customers and acquire new ones? Explain.
4. In your country, are data mining technologies currently applied in industry? Name a few of these industries.
5. Do you think marketing managers can forecast their sales? Explain.

Part II. Language Practice

A. Choose a, b, c, or d which best completes each item.

1. One of the many data mining problems is the extraction of sequences from traditional databases.
 - a. frequent
 - b. special
 - c. ordinary
 - d. organized
2. Sequence mining finds its in many different areas.
 - a. cost
 - b. approach
 - c. way
 - d. application
3. By examining a medical database, researchers may discover that the occurrence of certain symptom sequence would likely certain illness.
 - a. try out
 - b. lead to
 - c. bring up
 - d. look on

4. DNA sequence analysis allows the discovery of hereditary illness, which helps predict a person is vulnerable to certain diseases.
- a. unless b. or
- c. whether d. for
5. An on-line bookstore may analyze the purchase sequences of its customers to their purchase patterns, which helps the store in designing sale and promotional strategies.
- a. cause b. infer
- c. verify d. retain

B. Fill in the blanks with the appropriate form of the words given.

1. Apply

- Enterprises have gathered huge amounts of data through many
- Data mining technologies are mature enough to be in industry.
- Embedding data mining into business applications is about intelligence back to business.

2. Analyze

- Data mining contains technologies that allow enterprises to the necessary factors.
- Every business would like to retain as many customers as possible. Churn can help marketing managers understand the reason for customer churn, improve customer relations, and eventually increase customer loyalty.
- One research conclusion shared by various says the data mining market is the fastest growing business intelligence component.

3. Use

- Churn analysis, cross selling, customer segmentation, and fraud detection are a few typical problems that can be solved data mining.
- Many retailers cross selling to increase their sales.
- Gene selection in data analysis has critical implications for the discovery of genes related to serious diseases.

4. Collect

- a. The first step of data mining is data
- b. The data in the data warehouse may not be rich enough. You may want to data from other sources.

5. Market

- a. In many organizations, the goal of data miners is to deliver reports to the executives.
- b. For a database company, the selection of potential customers to mail an offer or catalog is of key importance.
- c. Data mining technology is being applied in virtually all business sections including banking, telecommunications, manufacturing, , and e-commerce.

C. Fill in the blanks with the following words.

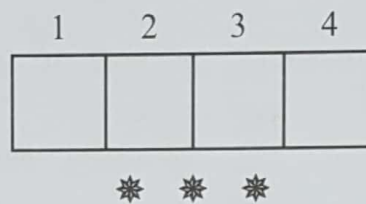
experiences	through	track
challenging	deeply	just
known as	nearly	as

In our solar system, the sun a periodic activity called 'solar maximum' for every 113 years followed by a period of quiet the solar 'minimum'. During the solar maximum sunspots appear dark blemishes on the surface of the sun. They are formed when magnetic field lines below the sun's surface are twisted and poked the solar photosphere. These changes of activities on the surface of the sun affect the atmospheric weather. One way to solar activities is by measuring sunspots. So, sunspot series can be a task for time series analysis.

D. Put the following sentences in the right order to form a paragraph. Write the corresponding letters in the boxes provided.

- a. However, only a very small number of them are related to a specific disease.
- b. A human being has around 30 thousand genes.

- c. Gene selection can be reduced to feature selection in pattern recognition and machine learning.
- d. It is the job of gene selection to find out such critical genes from the 30 thousand genes.



Section Two: Further Reading

Data Mining Tasks

Data mining can be used to solve hundreds of business problems. Based on the nature of these problems, we can group them into the following data mining tasks.

Classification

Classification is one of the most popular data mining tasks. Business problems like churn analysis, finding out which customers are most likely to switch to a competitor, usually involves classification.

Classification refers to assigning cases into categories based on a predictable attribute. Each case contains a set of attributes, one of which is the class attribute (predictable attribute). The task requires finding a model that describes the class attribute as a function of input attributes. In the College Plans dataset previously described, the class is the College Plans attribute with two states: Yes and No. To train a classification model, you need to know the class value of input cases in the training dataset.

Clustering

Clustering is also called segmentation. It is used to identify natural groupings of cases based on a set of attributes. Cases within the same group have more or less similar attribute values.

Figure 4-3 displays a simple customer dataset containing two attributes: age and income. The clustering algorithm groups the dataset into three segments based on these two attributes. Cluster 1 contains the younger population with a low income. Cluster 2 contains middle-aged customers with higher incomes. Cluster 3 is a group of senior individuals with a relatively low income.

Association

Association is another popular data mining task. Association is also called market basket analysis. A typical association business problem is to analyze a sales transaction table and identify those products often sold in the same shopping basket. The common usage of association is to identify common sets of items (frequent itemsets) and rules for the purpose of cross-selling.

In terms of association, each product, or more generally, each attribute/value pair is considered an item. The association task has two goals: to find frequent itemsets and to find association rules.

An association rule has the form $A, B \Rightarrow C$ with a probability, where A, B, C are all frequent itemsets. The probability is also referred to as the *confidence* in data mining literature. The probability is a threshold value that

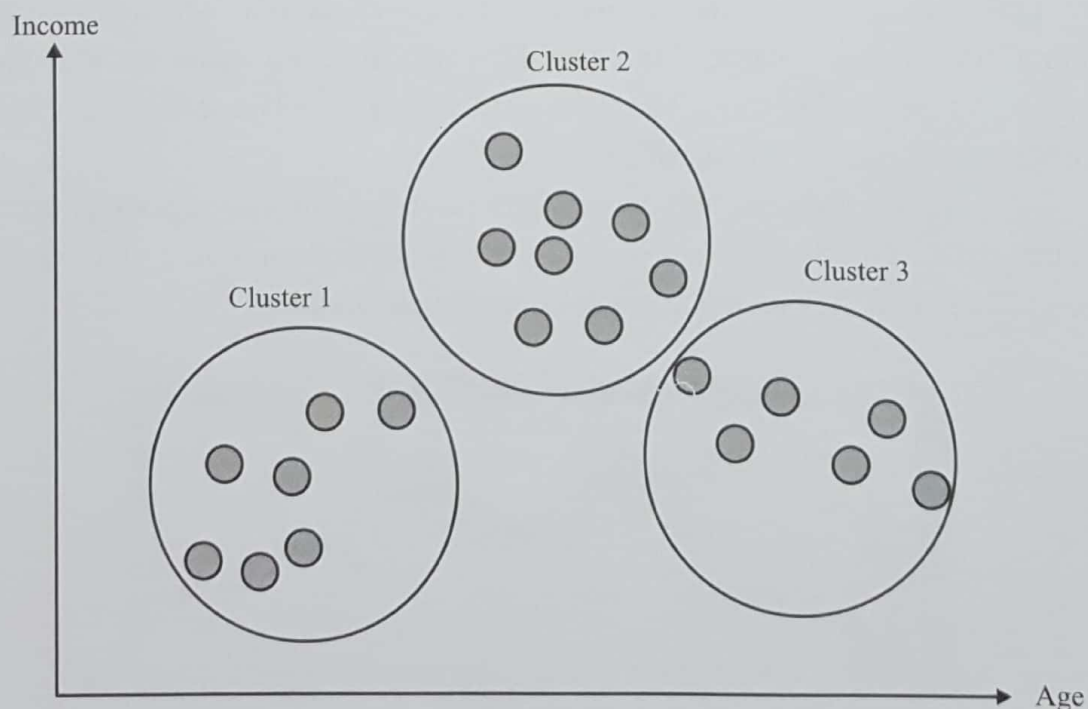


Figure 4-3. Clustering.

the user needs to specify before training an association model. For example, the following is a typical rule: Product = "Pepsi", Product = "Chips" \Rightarrow Product = "Juice" with an 80% probability. The interpretation of this rule is straightforward. If a customer buys Pepsi and chips, there is an 80% chance that he or she may also buy juice.

Regression

The regression task is similar to classification. The main difference is that the predictable attribute is a continuous number. Regression techniques have been widely studied for centuries in the field of statistics. Linear regression and logistic regression are the most popular regression methods. Other regression techniques include regression trees and neural networks.

Regression tasks can solve many business problems. For example, they can be used to predict wind velocities based on temperature, air pressure, and humidity.

Forecasting

Forecasting is yet another important data mining task. What will the stock value of MSFT be tomorrow? What will the sales amount of Pepsi be next month? Forecasting can help to answer these questions. It usually takes as an input time series dataset, for example a sequence of numbers with an attribute representing time. The time series data typically contains adjacent observations, which are order-dependant.

Figure 4-4 contains two curves. The solid line curve is the actual time series data on Microsoft stock value, while the dotted curve is a time series model based on the moving average forecasting technique.



Figure 4-4. Time Series.

Sequence Analysis

Sequence analysis is used to find patterns in a discrete series. A sequence is composed of a series of discrete values (or states). For example, a Web click sequence contains a series of URLs. Customer purchases can also be modeled as sequence data. For example, a customer first buys a computer, then speakers, and finally a Webcam. Both sequence and time series data contain adjacent observations that are dependent. The difference is that the sequence series contains discrete states, while the time series contains continuous numbers.

Sequence and association data are similar in the sense that each individual case contains a set of items or states. The difference between sequence and association models is that sequence models analyze the state transitions, while the association model considers each item in a shopping cart to be equal and independent. With the sequence model, buying a computer before buying speakers is a different sequence than buying speakers before a computer. With an association algorithm, these are considered to be the same itemset.

Figure 4-5 displays Web click sequences. Each node is a URL category. Each line has a direction, representing a transition between two URLs. Each transition is associated with a weight, representing the probability of the transition between one URL and the other.

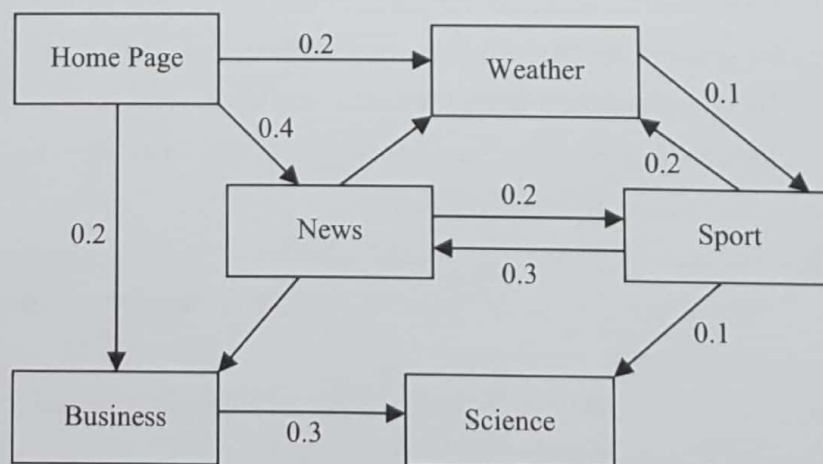


Figure 4-5. Web Navigation Sequence.

Deviation Analysis

Deviation analysis is, for finding those rare cases that behave very differently from others. It is also called outlier detection, which refers to the detection of significant changes from previously observed behavior. Deviation analysis can be used in many applications. The most common one is credit card fraud detection. To identify abnormal cases from millions of transactions is a very challenging task. Other applications include network intrusion detection, manufacture error analysis, and so on.

(Tang: pp. 1-20)

Comprehension Exercises

A. Choose a, b, c, or d which best completes each item.

1. Which of the following best describes the organization of the third paragraph?
 - a. Classification is analyzed followed by some examples.
 - b. The author introduces a data mining technique followed by a description.
 - c. Classification is defined followed by an explanation.
 - d. The author explains a data mining technique followed by its applications.
2. Why does the author refer to the College Plans?
 - a. To suggest a solution for churn analysis.
 - b. To provide evidence that confirms the previously stated opinion.
 - c. To present an explanation for the class.
 - d. To give an example of the class attribute.
3. It can be inferred from the text that in terms of clustering,
 - a. cases are grouped as attributes
 - b. all input attributes are treated equally
 - c. attributes of various values constitute similar cases within the same group
 - d. only two attributes are needed in the modeling process
4. It is NOT true that clustering
 - a. is also known as segmentation
 - b. is used to identify groupings of cases based on a set of attributes

- c. refers to one of the fundamental operations in data mining
 - d. builds the model through a variety of single attributes
5. As we understand from the text, association rules help to
- a. encourage the customer to approve of the products
 - b. identify similar items
 - c. push the customer to buy what you suggest
 - d. predict what products the customer is likely to buy
6. Which of the following is NOT true, according to the passage?
- a. Regression is similar to classification.
 - b. Classification is not used to predict wind velocities.
 - c. Regression is not a new technique.
 - d. Classification is identical to regression.
7. Forecasting technique deals with
- a. probability
 - b. linearity
 - c. relativity
 - d. periodicity
8. According to the passage,
- a. sequence and time series data are different in the sense that the former contains discrete states, while the latter contains continuous numbers
 - b. sequence data has no similarity to association data
 - c. regression and classification have nothing in common
 - d. clustering is used to analyze cases with different attribute values
9. Why did the author write the passage?
- a. To discuss different data mining tasks.
 - b. To prove the efficiency of data mining techniques.
 - c. To inform us of the current business problems.
 - d. To describe the development of data mining tasks.
10. How does the author demonstrate that business problems are NOT consistent?
- a. By grouping them into several data mining tasks.
 - b. By giving different examples to make the concepts clear.
 - c. By suggesting that retailers should apply similar techniques to solve their problems.
 - d. By presenting problems that could be solved in more than one way.

11. Why does the author refer to deviation as an 'outlier detection'?
- a. Because deviation analysis is mainly used to find out credit card fraud.
 - b. Because deviation analysis provides information not derived from previous observations.
 - c. Because deviation analysis investigates very significant fraudulent claims.
 - d. Because deviation analysis detects cases whose behavior is very different from that of others.
12. Why does the author mention Web in the passage?
- a. To give a reason for sequence analysis.
 - b. To demonstrate the technique of sequence analysis.
 - c. To discuss URL categories.
 - d. To point out Web navigation.

B. Write the answers to the following questions in the spaces provided.

1. How does the class attribute relate to a case?

.....
.....

2. In terms of clustering, how are cases within the same group related?

.....
.....

3. What does association consider an item?

.....
.....

4. What is deviation analysis used for?

.....
.....

5. How does data mining help business?

.....
.....

Section Three: Translation Activities

A. Transle the following passage into Persian.

Data Cleaning and Transformation

Data cleaning and transformation is the most resource-intensive step in a data mining project. The purpose of data cleaning is to remove noise and irrelevant information out of the database. The purpose of data transformation is to modify the source data into different formats in terms of data types and values. There are various techniques you can apply to data cleaning and transformation, including data type transform, continuous column transform, grouping, aggregation, missing value handling, and removing outliers.

B. Find the Persian equivalents of the following terms and expressions and write them in the spaces provided.

1. association
2. clustering
3. data mining
4. database
5. deviation analysis
6. enterprise
7. forecasting
8. fraud
9. intrinsic
10. iteration
11. query
12. regression
13. sequence analysis
14. switch
15. train

Unit 5

Section One: Reading Comprehension

The PC System Unit: Looking in the Box

The processor, RAM, and a variety of other electronic components are housed in the **system unit**, usually a metal and plastic upright box (the tower), or inside the laptop's shell. In this section, we'll look inside the box at the major electronic components of a computer system.

The Motherboard

The motherboard, a single circuit board, provides the path through which the processor communicates with memory components and peripheral devices. Think of the processor as the PC's brain and the motherboard as the PC's central nervous system. The motherboard's **chipset** is its intelligence and controls the flow of information between system components connected to the board. The chipset is important because it determines what features are supported on the system (including types of processors and memory). In a personal computer, the following are attached to the motherboard:

- Microprocessor (main processor)
- Support electronic circuitry (for example, one chip handles input/output signals from the peripheral devices)
- Memory chips (for example, RAM and other types of memory)
- Expansion boards (optional circuit boards, such as a fax/modem)

The various chips have standard-sized pin connectors that allow them to be attached to the motherboard and, therefore, to a common electrical **bus** that enables data flow between the various system components.

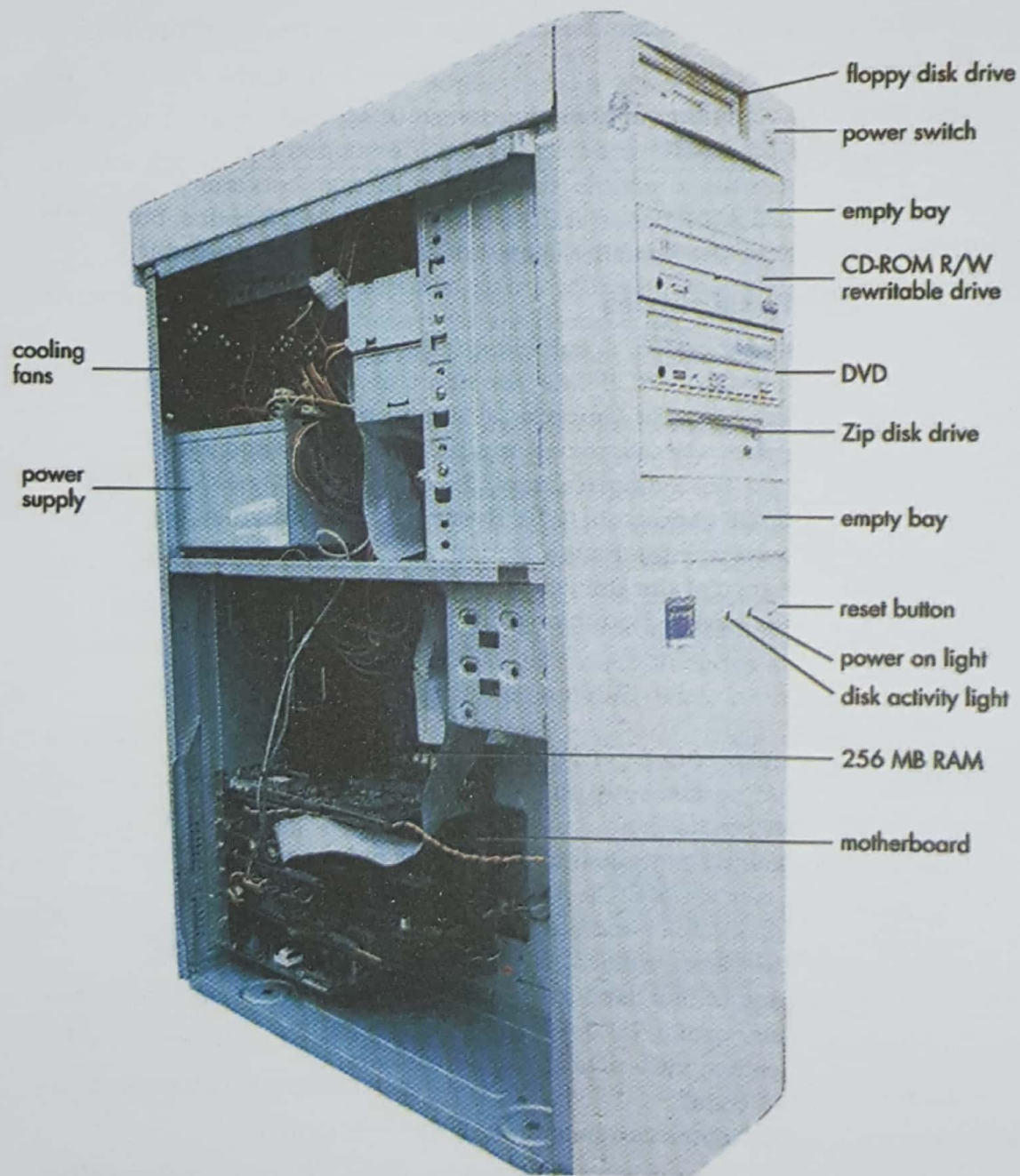


Figure 5-1. System Unit and Motherboard. The system unit is this box and its content—the computer system’s electronic circuitry, including the motherboard with the processor and various expansion boards and various storage devices.

Computer on a Chip: The Microprocessor

What is smaller than a postage stamp and found in wristwatches, sewing machines, and CD players? The answer is a **microprocessor**. The processor component of personal computer systems is a microprocessor, or simply a small processor. The microprocessor is literally a 'computer on a chip'. We use the term *chip* to refer to any self-contained integrated circuit. The size of chips varies from fingernail size to postage-stamp size (about 1-inch square). Microprocessors have been integrated into thousands of mechanical and electronic devices—even elevators, band saws, and ski-boot bindings. In a few years, virtually everything mechanical or electronic will incorporate microprocessor technology into its design.

The Processor

The processor runs the show and is the nucleus of any computer system. Regardless of the complexity of a processor, sometimes called the **central processing unit** or CPU, it has only two fundamental sections: the *control unit* and the *arithmetic and logic unit*. These units work together with random-access memory (RAM) and other internal memories to make the processor—and the computer system—go.

The Control Unit. Just as the processor, or CPU, is the nucleus of a computer system, the **control unit** is the nucleus of the processor. It has three primary functions:

- To read and interpret program instructions
- To direct the operation of internal processor components
- To control the flow of programs and data in and out of RAM

During program execution, the first in a sequence of program instructions is moved from RAM to the control unit, where it is decoded and interpreted by the **decoder**. The control unit then directs other processor components to carry out the operations necessary to execute the instruction.

The processor contains high-speed working storage areas called **registers** that can store no more than a few bytes. Because registers reside on the processor chip, they handle instructions and data at very high speeds and are used for a variety of processing functions. One register, called the **instruction register**, contains the instruction being executed. Other general-

purpose registers store data needed for immediate processing. Registers also store status information. For example, the **program register** contains the location in RAM of the next instruction to be executed. Registers facilitate the processing and movement of data instructions between RAM, the control unit, and the arithmetic and logic unit.

The Arithmetic and Logic Unit. The arithmetic and logic unit performs all computations (addition, subtraction, multiplication, and division) and all logic operations (comparisons). The results are placed in a register called the **accumulator**. A *logic* operation compares two pieces of data, either alphabetic or numeric. Based on the result of the comparison, the program 'branches' to one of several alternative sets of program instructions.

RAM. RAM, a *read-and-write memory*, enables data to be both read and written to memory. RAM is *solid state*; that is, it is electronic circuitry with no moving parts. Electrically charged points in the RAM chips represent the bits (1s and 0s) that comprise the data and other information stored in RAM. RAM is attached to the motherboard, like the processor, and therefore to the electronic bus. It is **volatile memory**; that is, when the electrical current is turned off or interrupted, the data are lost. In contrast to permanent storage on disk, RAM provides the processor only with *temporary* storage for programs and data.

The data in RAM are manipulated by the processor according to program instructions. A program instruction or a piece of datum is stored in a specific RAM location called an **address**. Addresses permit program instructions and data to be located, accessed, and processed. The content of each address changes frequently as different programs are executed and new data are processed.

Other High-Speed Memories. Data and programs are being continually moved in and out of RAM at electronic speeds. But that's not fast enough. To achieve even faster transfer of instructions and data to the processor, computers are designed with **cache memory**. Cache memory is used by computer designers to increase computer system throughput. **Throughput** refers to the rate at which work can be performed by a computer system.

Another special type of internal memory, called *read-only memory*

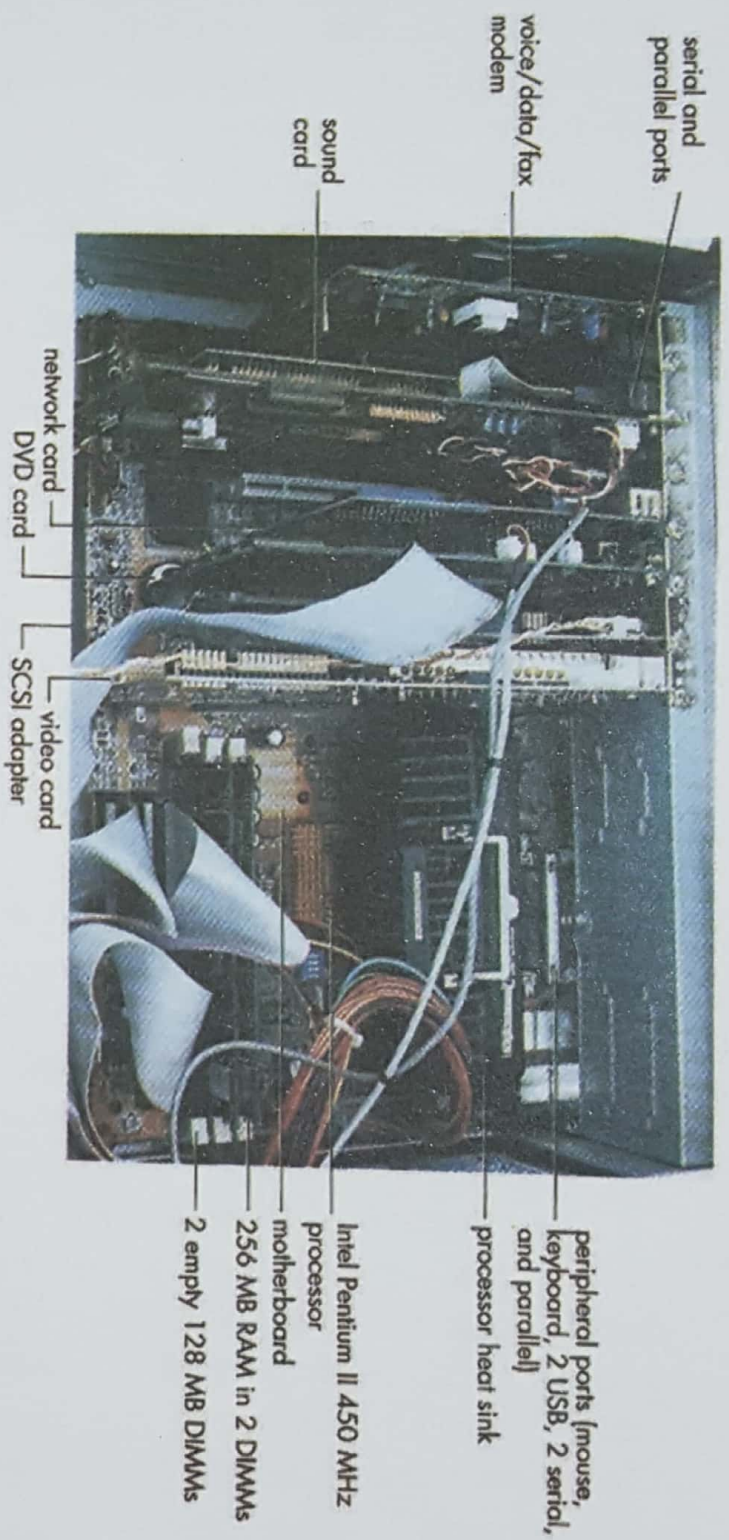


Figure 5-2. Motherboard With Components. Here a motherboard is configured with a processor, memory, and various expansion cards. It has a 450-MHz Intel Pentium II processor, 512 K of cache memory, plus three ISA expansion slots, three PCI local bus slots, and one AGP slot for adding capabilities, such as a voice /data/fax modem. The motherboard has four DIMMs that can accept 512 MB of SDRAM. It also has mouse and keyboard ports, two serial ports, one parallel port, and two USB ports.

(ROM), cannot be altered by the user. A variation of ROM is **programmable read-only memory (PROM)**. PROM is ROM into which you, the user, can load read-only programs and data. **Flash memory** is a type of PROM that can be altered easily by the user. Flash memory, a feature of new processors, I/O devices, and storage devices, is **nonvolatile memory** that retains its contents after an electrical interruption. The logic capabilities of these devices can be upgraded by simply downloading new software from the Internet or a vendor-supplied disk to flash memory.

A Fleet of Buses

The motherboard includes several empty **expansion slots** that provide direct connections to the common electrical bus. These slots let you expand the capabilities of a basic PC by plugging in a wide variety of special-function **expansion boards**, also called **expansion cards**. These add-on circuit boards contain the electronic circuitry for many supplemental capabilities, such as extra ports, a modem, or video capture capability. Expansion boards are made to fit a particular type of bus.

(Winn L. Rosch: Internet)

Part I. Comprehension Exercises

A. Put "T" for true and "F" for false statements. Justify your answers.

- 1. Buses are electrical pathways through which the processor sends data and commands to RAM and all peripheral devices.
- 2. The arithmetic and logic unit cannot function without the control unit.
- 3. The arithmetic and logic unit controls the flow of programs and data in and out of main memory.
- 4. All calculations and comparisons take place in the arithmetic unit.
- 5. Programs and data contained in RAM cannot be changed by the user.
- 6. The result of an arithmetic or logic operation is placed in a computer register called accumulator.

B. Choose a, b, c, or d which best completes each item.

1. We can conclude from the text that
 - a. the central processing unit, along with the input/output devices, is responsible for all the activities taking place within a computer
 - b. the motherboard is a microprocessor circuit board that contains the microprocessor, electronic circuitry for handling such tasks as input/output signals from peripheral devices, and memory chips
 - c. control unit mainly directs the flow of information between main memory and registers
 - d. the arithmetic and logic unit is responsible for the interpretation of program instructions
2. Which of the following statements regarding the control unit is best supported by the passage?
 - a. The control unit plays no part in the flow of data in and out of memory.
 - b. The arithmetic and logic unit directs the control unit in reading program instructions.
 - c. The control unit reads and interprets program instructions.
 - d. The computer can be a useful device even without the control unit.
3. It is understood from the text that
 - a. the arithmetic and logic unit is the most important component of the computer
 - b. the control unit contains a high-speed register called accumulator
 - c. registers are high-capacity memory elements
 - d. program and data on which the control unit operates are held in main memory
4. The rate at which work can be performed by a computer system is called
 - a. system spray
 - b. throughput
 - c. push through
 - d. volume load
5. Which one of the following memory groups are in order based on speed (slower to fastest)?
 - a. registers, cache, RAM
 - b. cache, RAM, registers
 - c. cache, registers, RAM
 - d. RAM, cache, registers

6. Which of the following would NOT be attached to a motherboard?
- | | |
|---------|--------------------|
| a. RAM | b. microprocessor |
| c. FLOP | d. expansion board |
7. Flash memory is a type of PROM that
- | | |
|--------------------|-------------------------------|
| a. is nonvolatile | b. can be altered by the user |
| c. can be upgraded | d. all of the above |

C. Answer the following questions orally.

1. What is the function of RAM?
2. Why is RAM called a solid state memory?
3. Explain volatility.
4. What is the function of an expansion slot?
5. Explain expansion cards.

Part II. Language Practice

A. Choose a, b, c, or d which best completes each item.

1. memory is frequently the memory of choice for computer-controlled systems that operate in harsh environments such as steel fabrication manufacturing facility.

a. Volatile	b. Cache
c. Nonvolatile	d. Read-only
2. Expansion boards also called expansion contain the electronic circuitry for many supplemental capabilities, such as a fax modem, and are made to fit a particular type of bus.

a. slots	b. cards
c. cables	d. buses
3. The contains the address of the next instruction to be executed.

a. instruction register	b. program counter
c. program register	d. instruction decoder
4. With only a fraction of the capacity of RAM, holds only those instructions and data that are likely to be needed next by the processor.

a. flash memory	b. ROM
c. cache memory	d. PROM

5. The contains the instruction being executed.
- a. decoder
 - b. instruction register
 - c. accumulator
 - d. data-address register

B. Fill in the blanks with the appropriate form of the words given.

1. Process

- a. The central unit is responsible for interpreting and executing the programs.
- b. A block diagram can show if a has to be repeated or if there are alternative routs to be taken.
- c. The applications of all the new students were by the computer.
- d. The status is a collection of 'indicators' that give some indication of the current state of the central processing unit at any moment.
- e. During, instructions and data are passed between the various types of internal memories, the processor's control unit, the ALU, and the peripheral devices over the common electrical bus.

2. Connect

- a. For processing to be real-time, it must be online, with the user terminal directly to the computer.
- b. Malfunctioning equipment can often be traced to a bad electrical
- c. External peripheral devices can be to the processor via cables.
- d. A large number of devices using a variety of can be linked to a PC.

3. Store

- a. The computer memory is capable of a lot of information for a short period of time.
- b. The recording heads of a tape drive access the information which is on a tape.

- c. Registers are part of the CPU, but they are not in primary
- d. It is less expensive to data on magnetic tapes or disks than in filing cabinets.

4. Place

- a. The type of processor and the amount of RAM on the motherboard define the PC's speed and capacity.
- b. The results of computations performed in the arithmetic and logic unit are in the accumulator.

5. Logic

- a. Compiler checks will not detect the presence of errors in a program.
- b. A program must be organized if successful results are to be obtained.

C. Fill in the blanks with the following words.

music	speakers	captured	receptacles
within	makes	stereo	

The sound card, which is included on most new PCs, two basic functions possible. First, it enables sounds to be and stored on disk. Second, it enables sounds, including and spoken words, to be played through external The sound card can add realism to computer games with music and sound effects. It also allows us to insert spoken notes our word processing documents. The typical sound card will have for a microphone, a headset, an audio output, and a joystick.

D. Put the following sentences in the right order to form a paragraph. Write the corresponding letters in the boxes provided.

- a. The data/voice/fax modem performs the same function as a regular modem, plus it has added capabilities.

- b. A different type of modem, the cable modem, is connected to the TV cable.
- c. A modem permits communication with remote computers via a telephone-line link.
- d. Fax machines transfer images of documents via telephone lines to another location.
- e. It enables you to receive and make telephone calls, and it enables your PC to emulate a fax machine.

1	2	3	4	5

* * *

Section Two: Further Reading

Processor Design

Researchers in IT are continually working to create new technologies that will make processors faster and, thereby, improve system throughput.

CISC and RISC: More Is Not Always Better

Most processors in mainframe computers and personal computers have a **CISC** (complex instruction set computer) design. A CISC computer's machine language offers programmers a wide variety of instructions from which to choose (add, multiply, compare, move data, and so on). Computer designers, however, are rediscovering the beauty of simplicity. Computers designed around much smaller machine language instruction sets (fewer instructions) can realize significantly increased throughput for certain applications, especially those that involve graphics (for example, computer-aided design or CAD). These computers have **RISC** (reduced instruction set computer) design. The RISC processor shifts much of the computational

burden from the hardware to the software. Proponents of RISC design feel that the limitations of a reduced instruction set are easily offset by increased processing speed and the lower cost of RISC microprocessors.

Parallel Processing: Computers Working Together

In a single processor environment, the processor addresses the programming problem sequentially, from beginning to end. Today, designers are building computers that break a programming problem into pieces. Work on each of these pieces is then executed simultaneously in separate processors, all of which are part of the same computer system. The concept of using multiple processors in the same computer system is known as **parallel processing**. 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 and solved. The individual pieces are then reassembled in the main processor for further computation, output, or storage. The net result of parallel processing is better throughput.

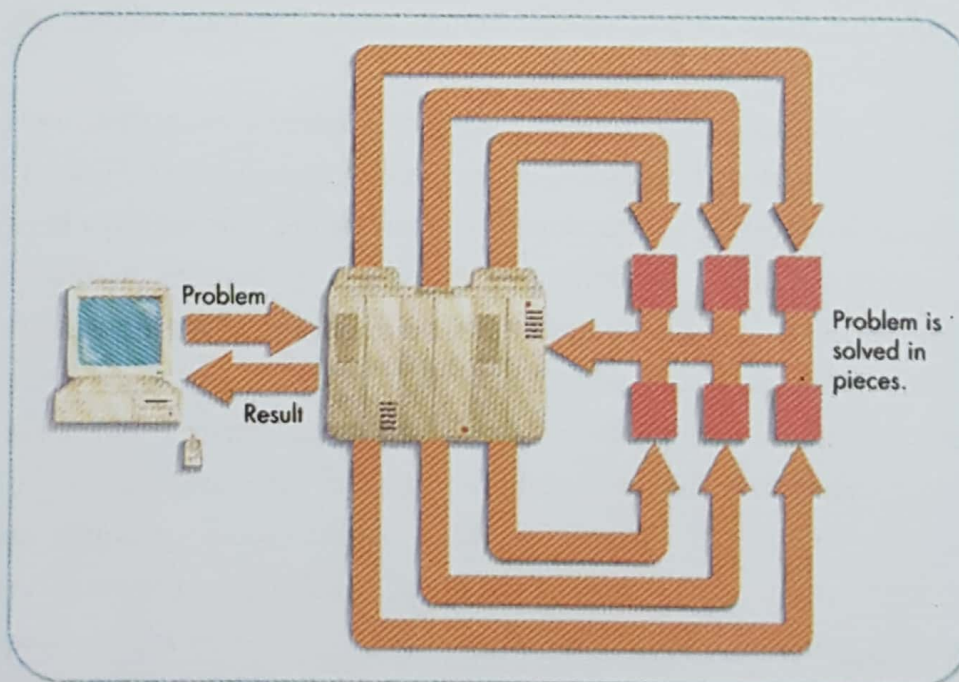


Figure 5-3. Parallel Processing. In parallel processing, auxiliary processors solve pieces of a problem to enhance system throughput.

Computer designers are creating mainframes and supercomputers with thousands of integrated microprocessors. Parallel processing on such a large scale is referred to as **massively parallel processing**. These superfast supercomputers have sufficient computing capacity to attack applications that have been beyond that of computers with traditional computer designs. For example, researchers can now simulate global warming with these computers.

Neural Networks: Wave of the Future

Most of us interact with digital computers. Digital computers are great at solving structured problems involving computations and logic operations. However, most of the challenges we face from day to day can't be solved with these capabilities. For example, several times each year we are confronted with this problem: to find a pair of shoes that fits. This is a very human problem, better suited to the workings of the human brain than for digital computers. Such problems involve unstructured input and outcomes that are unclear, so we use the best available processor—our brain. Scientists are studying the way the human brain works and are attempting to build computers that mimic the incredible human mind. The base technology for these computers is **neural networks**.

The neural network computer employs hundreds, even thousands, of small, interconnected processors, called *processing units*. The neural network works by creating connections and maintaining relationships between these processing units, the computer equivalent of neurons in the brain. Working within a specific sphere of knowledge (for example, worldwide agriculture strategies), the neural network computer can draw from its human-supplied knowledge base, learn through experience, and make informed decisions in an unstructured environment. Here are but a few of an increasing number of neural network applications: playing chess, improving automobile engine efficiency, enabling improved vision technology, planning crop rotation strategies, and forecasting financial market fluctuations.

The primary difference between traditional digital computers and

neural networks is that digital computers process *structured data sequentially* whereas neural networks process *unstructured information simultaneously*. Digital computers will always be able to outperform neural networked computers and the human brain when it comes to fast, accurate numeric computation. However, if neural networks live up to their potential, they will be able to handle tasks that are currently very time-consuming or impossible for conventional computers, such as recognizing a face in the crowd.

(George W. Gorsline: pp. 409-411)

Comprehension Exercises

A. Choose a, b, c, or d which best completes each item.

1. The concept of using multiple processors in the same computer system is known as processing.
 - a. massive
 - b. acute
 - c. parallel
 - d. perpendicular
2. The base technology for computers that mimic the human mind is called
 - a. heuristic technology
 - b. neural network
 - c. human brain focus
 - d. interconnected processing
3. Neural networks process unstructured information
 - a. intermittently
 - b. sequentially
 - c. as time permits
 - d. simultaneously
4. It can be inferred from the passage that
 - a. computers are aware of their environment and have their entire past experience always available
 - b. computers are not only adapted to calculate but also suited to think, reason, and discover
 - c. neural network computers, like human beings, can reason in a simple step-by-step manner
 - d. neural network computers are supposed to learn by trial-and-error discovery
5. Which of the following statements is NOT true?
 - a. The instruction set for RISC computers is smaller than that for

CISC computers.

- b. In a single processor environment, the processor addresses the programming problem sequentially.
- c. Parallel processing on large scales using supercomputers with thousands of integrated microprocessors is referred to as massively trapezoidal processing.
- d. Playing chess and forecasting financial market fluctuations are examples of neural network applications.

B. Write the answers to the following questions in the spaces provided.

1. How would you explain the difference between structured and unstructured information?

.....
.....

2. What is the advantage of traditional digital computers over neural network computers?

.....
.....

3. According to the last paragraph, what is an example of a time-consuming task that may be handled by a neural network computer?

.....
.....

4. Why have computer designers started a trend toward simplicity?

.....
.....

5. What is the mechanism of parallel processing based on?

.....
.....



Section Three: Translation Activities

A. Translate the following passage into Persian.

Should PC Ownership Be an Entrance Requirement for Colleges?

As the job market tightens, colleges are looking to give their students a competitive edge. With computer knowledge becoming a job prerequisite for many positions, hundreds of colleges have made the purchase of a personal computer a prerequisite for admission. Personal computers are versatile in that they can be used as stand-alone computers or they can be linked to the college's network, the Internet, or other personal computers in a classroom. At these colleges, PCs are everywhere—in classrooms, lounges, libraries, and other common areas.

Wouldn't it be great to run a bibliographic search from your dorm room or home? Make changes to a report without retyping it? Run a case search for a law class? Use the computer for math homework calculations?

Instead of making hard copies of class assignments, some instructors key in their assignments, which are then 'delivered' to each student's electronic mailbox. At some colleges, student PCs are networked during class enabling immediate distribution of class materials. Students can correspond with their instructors through their computer to get help with assignments. They can even 'talk' to other students at connected colleges.

B. Find the Persian equivalents of the following terms and expressions and write them in the spaces provided.

1. bus
2. cable modem
3. chip
4. chipset
5. complex instruction set computer
6. decoder

7. expansion board	.....
8. expansion slots	.....
9. flash memory	.....
10. instruction register	.....
11. integrated circuit	.....
12. machine cycle	.....
13. motherboard	.....
14. neural network	.....
15. parallel processing	.....
16. programmable read-only memory	.....
17. program register	.....
18. reduced instruction set computer	.....
19. register	.....
20. synchronous dynamic RAM	.....
21. throughput	.....
22. volatile memory	.....