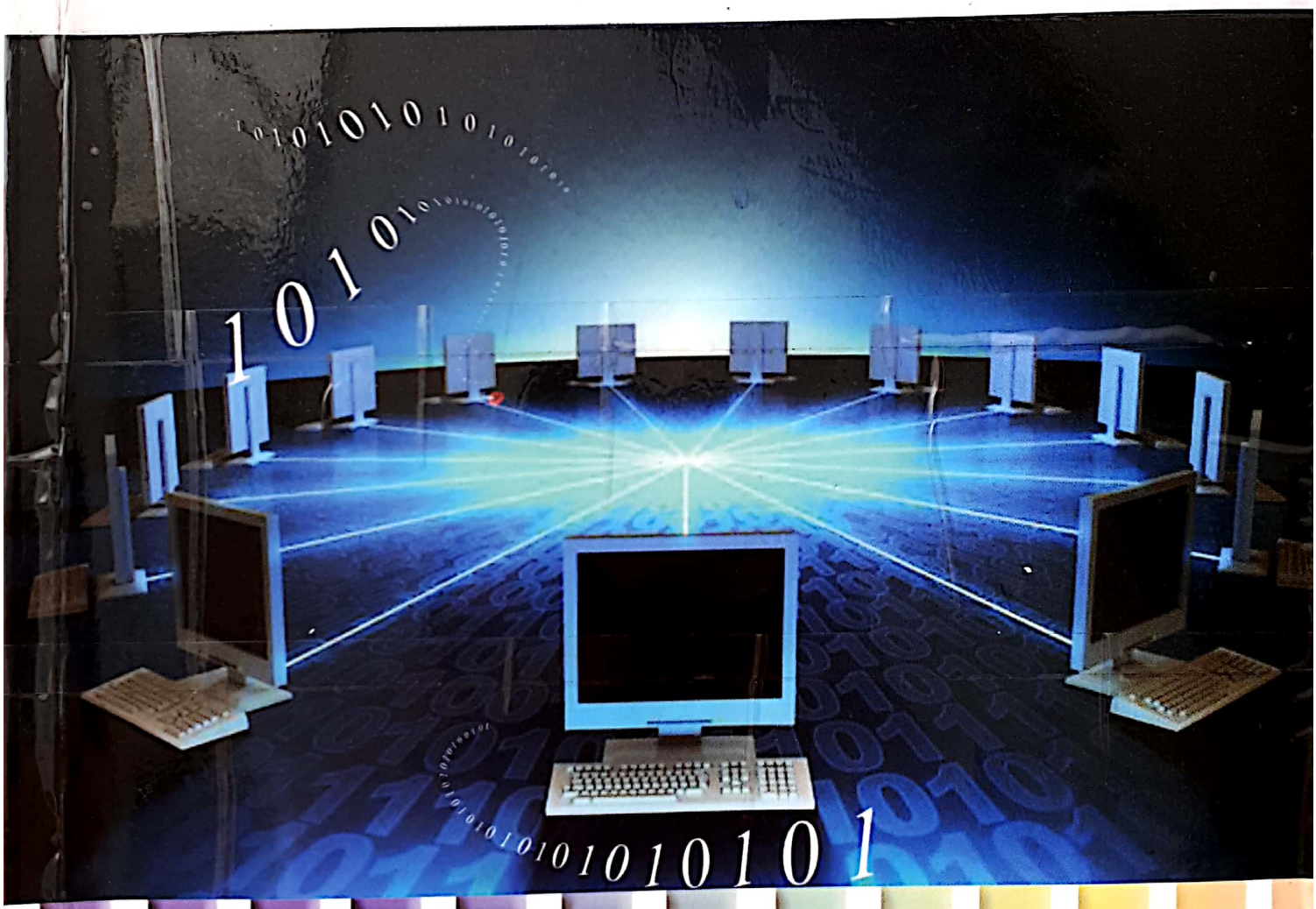
English for Computer and IT Students



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In the Name of God

English for Computer and IT Students

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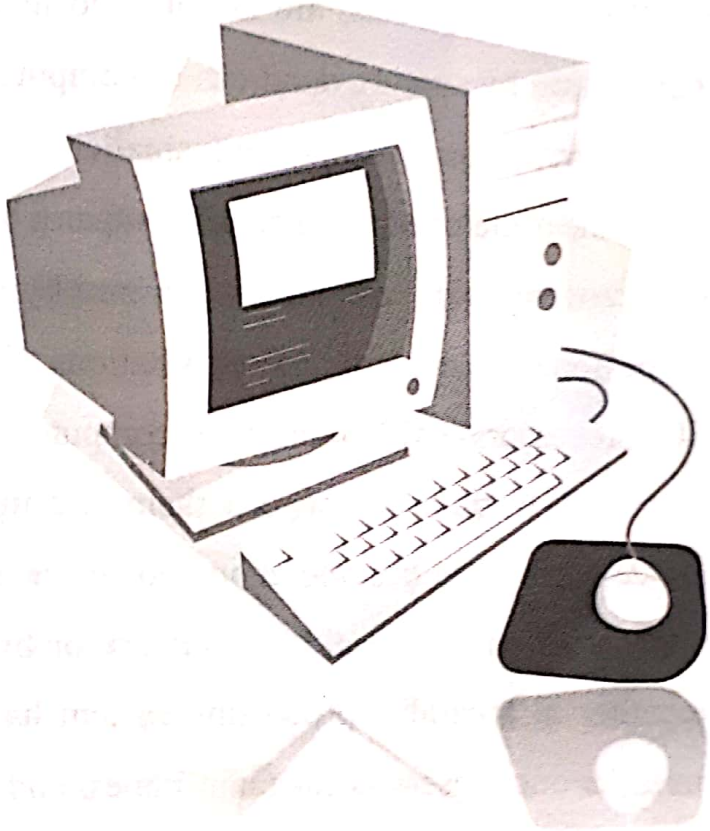
Unit 1 - Computer



What is a Computer?

Computer is a device capable of performing a series of arithmetic or logical operations. A computer is distinguished from a calculating machine, such as an electronic calculator, by being able to store a computer program by the number and complexity of the operations it can perform, and by its ability to process, store, and retrieve data without human intervention. Computers developed along two separate engineering paths, producing two distinct types of computer analog and digital. An analog computer operates on continuously varying data; a digital computer performs operations on discrete data.

Computers are categorized by both size and the number of people who can use them concurrently. Supercomputers are sophisticated machines designed to perform complex calculations at maximum speed; they are used to model very large dynamic systems, such as weather patterns. *Mainframes,* the largest and most powerful general-purpose systems, are designed to meet the computing needs of a large organization by serving hundreds of computer terminals at the same time. *Minicomputers,* though somewhat smaller, also are multiuser computers, intended to meet the needs of a small company by serving up to a hundred terminals. *Microcomputers,* computers powered by a microprocessor, are subdivided into personal computers and workstations, the latter typically incorporating RISC processors. Although microcomputers were originally single-user computers, the distinction between them and minicomputers has blurred as microprocessors have become more powerful. Linking multiple microcomputers together through a local area network or by joining multiple microprocessors together in a parallel-processing system has enabled smaller systems to perform tasks once reserved for mainframes, and the techniques of grid computing have enabled computer scientists to utilize the unemployed processing power of connected computers.

Analog Computers

An analog computer represents data as physical quantities and operates on the data by manipulating the quantities. It is designed to process data in which the variable quantities vary continuously analog circuit; it translates the relationships between the variables of a problem into analogous relationships between electrical quantities, such as current and voltage, and solves the original problem by solving the equivalent problem, or analog, that is set up in

its electrical circuits. Because of this feature, analog computers have especially been useful in the simulation and evaluation of dynamic situations, such as the flight of a space capsule or the changing weather patterns over a certain area.

Digital Computers

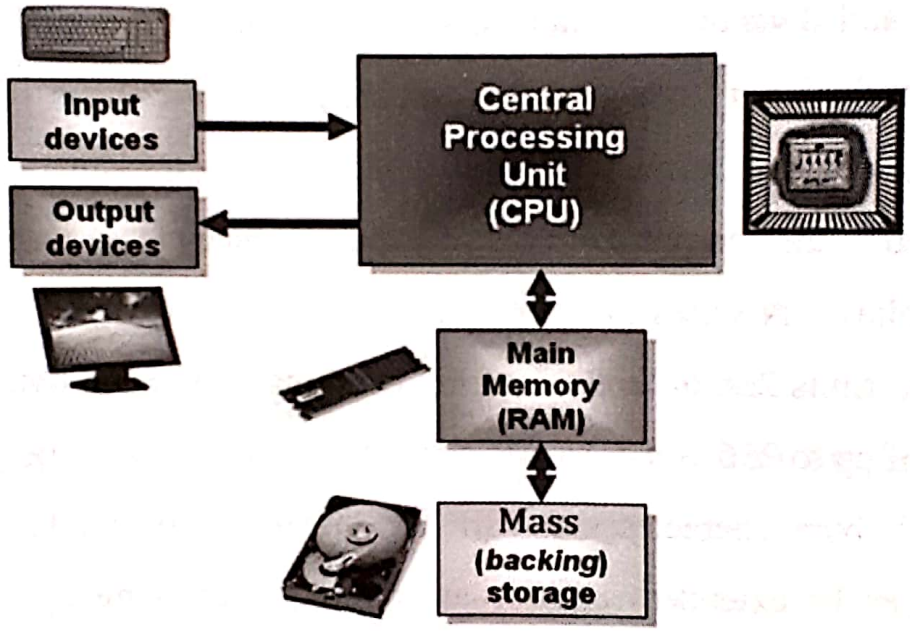
A digital computer is designed to process data in numerical form; its circuits perform directly the mathematical operations of addition, subtraction, multiplication, and division. The numbers operated on by a digital computer are expressed in the binary system; binary digits, or bits, are 0 and 1, so that 0, 1, 10, 11, 100, 101, etc., correspond to 0, 1, 2, 3, 4, 5, etc. Binary digits are easily expressed in the computer circuitry by the presence (1) or absence (0) of a current or voltage. A series of eight consecutive bits is called a "byte"; the eight-bit byte permits 256 different "on-off" combinations. Each byte can thus represent one of up to 256 alphanumeric characters, and such an arrangement is called a "single-byte character set" (SBCS); the de facto standard for this representation is the extended *ASCII* character set. Some languages, such as Japanese, Chinese, and Korean, require more than 256 unique symbols. The use of two bytes, or 16 bits, for each symbol, however, permits the representation of up to 65,536 characters or ideographs. Such an arrangement is called a "double-byte character set" (DBCS); *Unicode* is the international standard for such a character set.

Processing of Data

Digital computer circuits are capable of performing thousands to trillions of arithmetic or logic operations per second, thus permitting the rapid solution of problems that would be impossible for a human to solve by hand. In addition to

the arithmetic and logic circuitry and a small number of registers (storage locations that can be accessed faster than main storage and are used to hold the intermediate results of calculations), the heart of the computer called the central processing unit, or CPU contains the circuitry that decodes the set of instructions, or program, and causes it to be executed.

All general-purpose computers require the following hardware components:



□ **Central Processing Unit (CPU):** The heart of the computer, this is the component that actually executes instructions.

□ **Memory :** Enables a computer to store, at least temporarily, data and programs.

□ **Mass Storage Device:** Allows a computer to permanently retain large amounts of data. Common mass storage devices include disk drives and tape drives.

□ **Input Device :** Usually a keyboard and mouse, the input device is the conduit through which data and instructions enter a computer.

□ **Output Device :** A display screen, printer, or other device that lets you see what the computer has accomplished.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T /(F) 1. A computer is ~~the same as~~ distinguished from a calculating machine.

T /(F) 2. An electronic calculator ~~can~~ can't process data.

T /(F) 3. An analog computer operates on ~~discrete data~~. continuously varying data

(T)/ F 4. Microcomputers are less powerful than mainframes.

(T)/ F 5. The changing weather patterns over a certain area are a dynamic situation.

T /(F) 6. By (1) it means the ~~absence~~ present of a current or voltage.

T /(F) 7. A human being ~~can~~ can't solve all the problems digital computer circuits can perform in a second by hand.

T /(F) 8. General-purpose computers ~~do not~~ need input devices.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is the difference between a calculator and a computer?
2. In what ways are analog and digital computers varied?
3. What are the different computer systems?
4. What is a byte?
5. Are there any problems a human can't solve by hand, but a computer can in a second?
6. What are the hardware components of a general-purpose computer?

3 Here are some <u>definitions</u> for some of the words in the text. You should look at the text and try to find the words and write them down in the space provided.

1. The component that decodes and executes instructions is:
   CPU.....
2. A component which enables a computer to store data and programs is:
   Memory.....,.....
3. A printer is an example of such a device:
   output device.....,.....

4. They are designed to process data in numerical form:
   .Digital...Computer.....,.....
5. They are useful in the simulations:
   ..Analog.....,.....
6. A device that is capable of performing a number of arithmetic or logical operations is: ..Computer.....

4 Refer back to the text and try to find <u>synonyms</u> (words with similar meanings) or <u>antonyms</u> (words with opposite meanings) for the following words.

1. device: machine
2. input: ≠ output
3. analog: ≠ digital
4. computing: calculation
5. sophisticated: complex
6. multi-user: ≠ single user
7. addition: ≠ subtraction
8. multiplication: ≠ division
9. varying: distinguished ≠ the same

5 Use the words given to complete the following sentences.

<u>circuits * devices * logical * manipulate * memory * feed * display *switches</u>

1- A computer is a machine that has a complicated network of electronic ……circuits…… which operate some switches.

2- The machine has the ability to store and ….manipulate…… letters, numbers and characters.

3- By inputting signals that turn on some ….switches…… and turn off some other ones it becomes possible to make the machine do what we want.

4- We can define computers as ...devices…… accepting information in the form of instructions called programs and characters called data.

5- The data, kept inside the computer in a place called …memory……., provide the information required for solving a problem.

6- The use of these machines would be very low if we couldn't …feed…… information in and get results back.

7- A printer and a CRT ..display…….. screen are two common devices for outputting information.

8- Solving a series of problems and making large numbers of ….logical…….. decisions cannot cause a computer to become tired or bored.

6 Match the following words in column A with their definitions in column B.

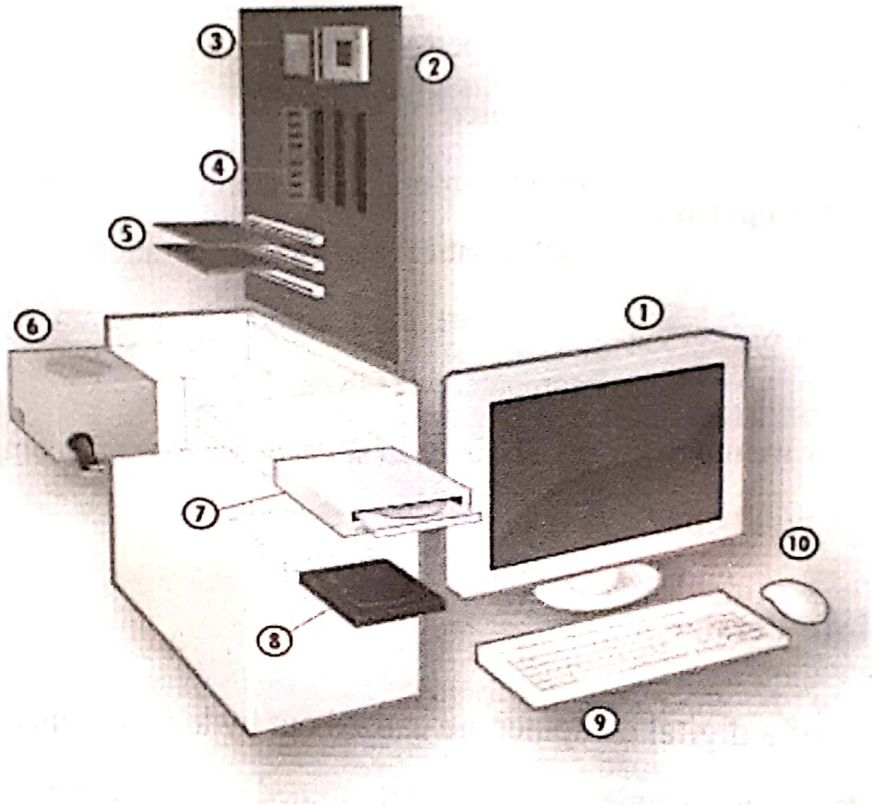
A	B
..C.. 1- CRT	a- An old instrument used for calculations, consisting

	of heads moving from left to right.
....e.. 2- Data	b- A computer that can simulate different measurements by electronic means.
...f... 3- Instruction	c- A visual display unit similar to a television screen.
..b... 4- Analog	d- A person being responsible for operating a computer.
..d... 5- Computer operator	e- The information, inputted with the program, on mathematical and logical operations are performed.
..a... 6- Abacus	f- A part of a computer program that tells the computer what to do.
...g.. 7- Primary memory	g- The internal storage locations of a computer.

7 Translate into Persian

The operations of a digital computer are carried out by logic circuits, which are digital circuits whose single output is determined by the conditions of the inputs, usually two or more. The various circuits processing data in the computer's interior must operate in a highly synchronized manner; this is accomplished by controlling them with a very stable oscillator, which acts as the computer's "clock". Typical computer clock rates range from several million cycles per second to several hundred million, with some of the fastest computers having clock rates of about a billion cycles per second.

Unit 2 - Computer Hardware



1.Monitor
2. Motherboard
3. CPU
4. RAM
5. Expansion Cards
6. Power Supply
7. Optical Disc Drive
8. Hard Disk Drive
9. Keyboard
10. Mouse

What is Hardware?

Hardware, in the computer world, refers to the physical components that make up a computer system. There are many different kinds of hardware that can be

installed inside, and connected to the outside of a computer. In other words, it refers to objects that you can actually touch, like disks, disk drives, display screens, keyboards, printers, boards and chips. In contrast, software is untouchable. Software exists as ideas, concepts, and symbols, but has no substance.

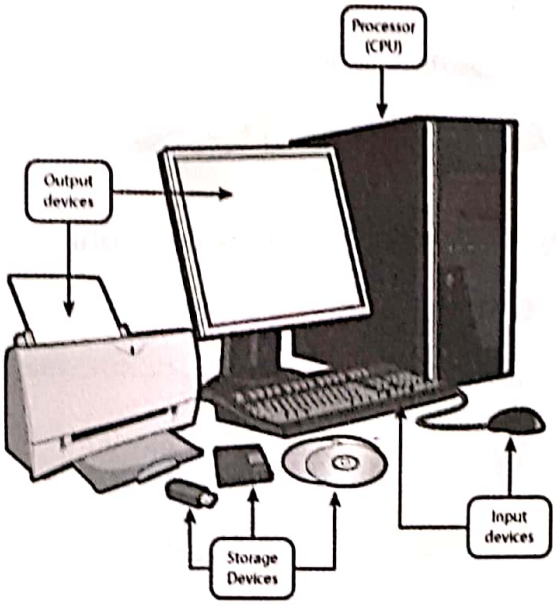
The internal hardware parts of a computer are often referred to as **components**, while external hardware devices are usually called **peripherals**. Together, they all fall under the category of computer hardware. Software, on the other hand, consists of the programs and applications that run on computers.

Personal computer is made up of multiple physical components of **computer hardware**, upon which can be installed a system software called operating system and a multitude of software applications to perform the operator's desired functions. Though a PC comes in many different forms, a typical personal computer consists of a case or chassis in a tower shape (desktop), containing components such as a motherboard, etc. Hardware of a modern personal computer list is as below.

Motherboard

The motherboard is the main component inside the case. It is a large rectangular board with integrated circuitry that connects the rest of the parts of the computer including the CPU, the RAM, the disk drives (CD, DVD, hard disk, or any others) as well as any peripherals connected via the ports or the expansion slots. Components directly attached to the motherboard include:

- The **Central Processing Unit** (CPU) performs most of the calculations which enable a computer to function, and is sometimes referred to as the "brain" of the computer. It is usually cooled by a heat sink and fan.
- The **Chip Set** mediates communication between the CPU and the other components of the system, including main memory.
- **RAM** (Random Access Memory) stores resident part of the current running OS (OS core and so on) and all running processes (applications parts, using CPU or input/output (I/O) channels or waiting for CPU or I/O channels).
- The **BIOS** includes boot firmware and power management. The Basic Input Output System tasks are handled by operating system drivers.
- **Internal Buses** connect the CPU to various internal components and to expansion cards for graphics and sound.
- **External Bus Controllers** support ports for external peripherals. These ports may be controlled directly by the south bridge I/O controller or based on expansion cards attached to the motherboard through the PCI bus.
- **A Power Supply Unit** (PSU) converts alternating current (AC) electric power to low-voltage DC power for the internal components of the computer. Some power supplies have a switch to change between 230 V and 115 V. Other models have automatic sensors that switch input voltage automatically, or are able to accept any voltage between those limits.



Removable Media Devices

Here are some types of removable media which are used for storing and transferring the information and also for backup: CD (compact disc) , DVD (digital versatile disc) ,Blu-ray Disc ,HD DVD ,Floppy disk ,USB flash drive and Tape drive.

Secondary Storage

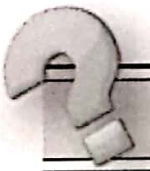
Hardware that keeps data inside the computer for later use and remains persistent even when the computer has no power, such as hard disk.

Input and Output Peripherals

Input and output devices are typically housed externally to the main computer chassis. The following are either standard or very common to many computer systems.

Input: Text input devices: Keyboard. Pointing devices: mouse, Touch screen. Gaming devices: joystick, gamepad. Image, Video input devices: Scanner, Web came. Audio input devices: Microphone.

Output: Printer, Speakers ,Headphones, types of Monitor such as CRT, LCD, LED and OLED.



EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / (F) 1. Software, like hardware, ~~can~~ can't be touched.

(T) / F 2. CPU is the brain of the computer.

(T) / F 3. Disks, display screens, keyboards and other objects which we can touch are of kinds of hardware.

(T) / F 4. CD, DVD, Blu-ray disc and so on can also be used for backup.

(T) / F 5. Operating system is system software.

T / (F) 6. The physical components making up a computer system are ~~software~~ hardware.

T / (F) 7. CPU usually ~~doesn't need~~ to be cooled.

T / (F) 8. The main component ~~outside~~ inside the case is the motherboard.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What makes up a computer system?

2. What can we do with hardware but not with software?

3. What is the difference between components and peripherals?

4. Can you name as many peripherals as you can?

5. Name some components?

6. What are some removable media used for backup?

3 Write the complete words for the following abbreviations:

1. CD: Compact disk
2. DVD: digital versatile disk
3. CPU: Central processing unit
4. PSU: power supply unit
5. I/O: input / output
6. BIOS: basic input output System
7. RAM: random access memory
8. AC: alternating Current
9. HD: high definition

4 Fill in the blanks to complete the sentences by referring to the text.

1. The .....chip set..... can mediate communication between the CPU and main memory for example.

2. The ..motherboard..... is a large rectangular board with integrated circuitry connecting the rest of the parts of the computer.

3. C.D.,.D.V.D.,..... are used for storing and transferring information and backup.

4. peripherals..... are the external hardware devices.

5. external..bus.... support ports for external peripherals.
Controllers

5 Use the words given to complete the following sentences.

malfunction * cylinder * central * original * programming * controls * permanent * programs

1- As soon as there is a ..malfunction..... in the system, the computer operator has to recognize it and report it to the manager.

2- Flowcharting, which is one of the steps in ....programming....., shows the logical path the computer will follow in order to execute a program.

3- A computer's operating system is a systems program which .....Controls..... the CPU, the input, the output, and the secondary memory devices.

4- Plotters are used to produce ...permanent..... copies of graphic output.

5- It may be necessary to create a new flowchart when the ..original..... one is missing.

6- Drums have a spinning .....Cylinder..... for each character position in a line.

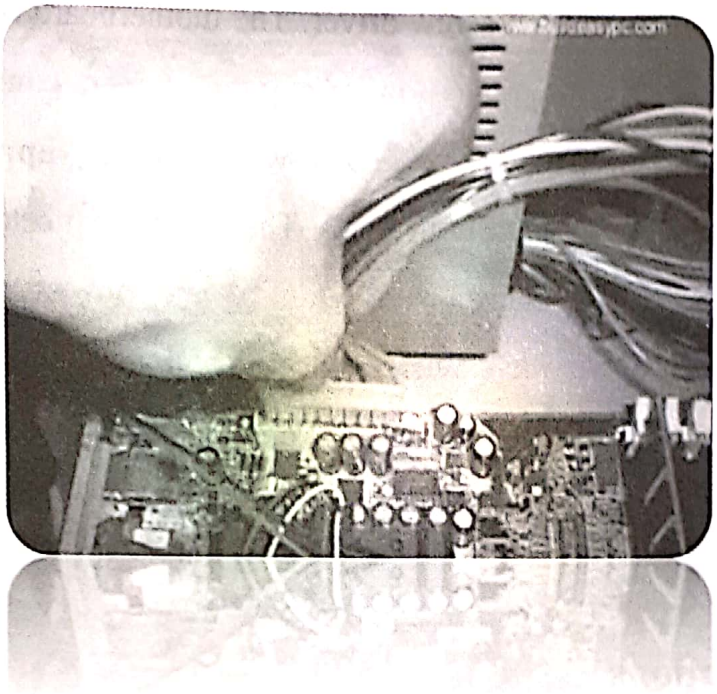
7- If located on secondary memory devices ..programs..... and data are first loaded into internal memory.

8- The function of the control unit within the .central..... processor is to transmit coordination control signals and commands.

6 Match the following words in column A with their definitions in column B.

A	B
...c... 1- Cobol	a- A straightforward sequence of steps or instructions used to solve a problem.
...e... 2- Execute	b- A program written in a high-level language, which is designed to do a special kind of work.
...g... 3- Off-line	c- A high-level programming language used for commercial applications.
...f... 4- Line printer	d- The information inputted with the program, and on which mathematical and logical operations are performed.
...a... 5- Algorithm	e- To run the instructions of a program after they have been changed into the machine code by the compiler.
..d... 6- Data	f- An impact printer having the character set to be printed on a cylinder.
..b... 7- Applications program	g- Any part of a computer system operating independently of the central processing unit.

Unit 3 - How to Build Your PC



The first step to build a computer is buying all the necessary hardware. When you have all the necessary hardware, you are ready to assemble your PC. Before unpacking your components from its original anti-static bags you must put on your anti-static wrist strap to discharge yourself. It is important that you discharge yourself or there is the danger that you can damage

Your components by anti-static shock by touching the components. If you don't have an anti-static wrist strap, you can discharge yourself by touching the metal edges of your tower case, although this is not recommended.

1 Motherboard Installation

The first thing you should do is unpack your **computer case**. Take off the cover of your case so that you can access the inside. Place the case on a desk so that you are looking down towards the open case. Your case should come with

motherboard screws. Now place your motherboard on top of the **screw holes**. The screw holes on your motherboard should align with the screw holes on your case. Place your screws that come with the case into the appropriate holes and gently screw it on using a screw driver. The motherboard is now securely mounted to the case. You can now place the **power connector** to the motherboard. Your tower case should come with a **power supply unit** (PSU) and should already be mounted to the case. The power connector is shown on image. Place the power connector on top of the **power socket** on the motherboard. Push down the power connector and it should clip onto the socket. If you try to fit the power connector the wrong way round, it won't fit. So, if the power connector does not go in, it should go in the other way round.

2 CPU Installations

Locate the **processor socket** on your motherboard. Remember that there are different types of sockets for different types of processors. You must buy the appropriate processor. Raise the brown **lever** on the socket and slowly put the processor in place. You have to make sure the **pin** 1 of your CPU goes into the pin 1 of your CPU socket otherwise the CPU would not get into the socket, so don't try to force it in. It will go in gently if you fit it correctly. Now close the brown lever which will securely hold the CPU in place. The processor should include a **heatsink** + **fan**. Make sure you got a fan that is correct for the speed of your CPU. Place the CPU fan on top the CPU and push down the **metal clips** on the fan so that it clips onto the CPU socket. CPU fan has a power connector which needs to be connected to **CPU fan power socket** on your motherboard.

Finally, you have to specify what frequency (speed) your CPU is running at. On some modern motherboards it can be done in the BIOS, or your motherboard may have automatic detection for your **CPU frequency**.

3 Memory Installations

Installing memory is quite simple. Find the SDRAM banks on your motherboard. Notice the memory banks have a white clip on each side. Make sure you release the clips. Hold each corner of the SDRAM placing it on top of the bank 1. If you are holding the SDRAM the incorrect way you will not be able to insert it. Gently push down the SDRAM and it should clip on to the memory bank. If you have more than one SDRAM, perform the same steps by placing the SDRAM in memory bank 2 and so on.

4 Hard Drive Installations

Serial ATA interface disk drives are designed for easy installation. With a Serial ATA interface (SATA), each disk drive has its own cable that connects directly to a Serial ATA host adapter or a Serial ATA port on your motherboard. Unlike Parallel ATA, there is no master slave relationship between drives that use a Serial ATA interface. Attach one end of the drive interface cable to the Serial ATA interface connector on your computer's motherboard or Serial ATA host adapter (see your computer manual for connector locations). Attach the interface and power cables to the drive. Secure the drive to the computer case with the mounting screws.

5 CD/DVD ROM Drive Installation

On the right hand side of the CD/DVD-ROM drive you have the **power connector**. Next to the power connector you have the **IDE connector**. On the left hand side near the IDE connector you have the **jumper settings** for the DVD-ROM. Next to the jumpers you have the **CD Audio-Out socket**. One side of your **audio cable** connects to this socket and the other side connects to the **sound card cd-in socket**. This allows you to listen to Audio CD's on your computer. Mount your CD/DVD-ROM drive into its **mounting slot**. Use the supplied screws to screw the drive into position. Connect the **IDE cable** to the **CD/DVD-ROM drive IDE connector**. Make sure the pin 1 on the cable is connected to pin 1 on the drive IDE connector. Pin 1 is the red or pink **strip** on the edge of an IDE cable. Connect the other end of the IDE cable to the **IDE socket** on your motherboard. Again, make sure you connect the cable to pin 1.

Finally connect the **power cable** to power connector and connect the **audio cable** to the CD Audio-Out socket as shown on the picture.

6 Graphic Card Installations

Most modern **graphics cards** are **AGP** and are connected to the **AGP bus** of the motherboard. You must connect your **AGP graphics card** to the **AGP bus slot** (a brown slot). Place your AGP card on top of the slot and gently push it down. The card should firmly sit into position. All you need to do now is to screw the **metal plate** on the front of the card to the computer case. Use the screws supplied with the case and screw the card to the case.

7 Sound Card Installations

Most modern sound cards are designed with the **PCI interface** and connected to the **PCI slots** of your motherboard. Place your sound card on top of a chosen slot. Gently push down the card so it sits into position. Once the card is seated correctly into position, screw the card on to the case. Finally insert the audio cable into the **CD-IN socket**. The other end of the cable should be connected to **Audio-out socket** on your CD/DVD-ROM drive.

8 Network Card Installations

Find a free PCI slot on your motherboard. Place your **network card** on top of the slot and gently push it down into position. Once the card has seated correctly into position, screw the card to the case using the screws supplied with the case.

YOU HAVE ASSEMBLED YOUR OWN PC. CONGRATULATIONS!

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / (F) 1. The ~~power socket~~ power connector on the motherboard should be placed on top of their ~~power connector~~ power socket.

(T) / F 2. We can access the inside by uncovering the case.

T / (F) 3. It is ~~recommended~~ not recommended to discharge ourselves by touching the metal edges of the case.

T / (F) 4. ~~Any kind of~~ appropriate fan can be placed on the CPU.

(T) / F 5. If you want the power connector to fit, it should be fit in the right way.

(T) / F 6. In order to mount the motherboard to the case we need a screw.

T / (F) 7. We have ~~one~~ different types of socket for all types of processors.

(T) / F 8. We are ready to assemble our PC when we have all the necessary hardware.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. When are we ready to assemble our PC?

2. How is it recommended to discharge ourselves?

3. How many things require to be installed so that we can say that our PC is assembled?

4. What should the interface and power cables be attached to?

5. What allows us to listen to Audio CD's on our PC?

6. What do we use to screw the things in their positions?

3 Complete the sentences below according to the text.

1. It's quite simple to ..installing..... memory.

2. We can see our computer .....manual..... for connector locations.
3. The pin 1 of our CPU should go into the pin 1 of our .....CPU..... socket.
4. Next to the .....IDE..... connector you have the power connector.

4 Refer back to the text and try to find <u>antonyms</u> (words with opposite meanings) for the following words.

1. charge: discharge
2. pack: unpack
3. static: anti-static
4. correct: wrong - incorrect
5. unscrew: screw

5 Match column A with column B by writing their letters in the parentheses.

A.	B.
1. Find a PCI (b)	a. to the drive.
2. Place your AGP card (f)	b. on your motherboard.
3. Pin 1 is (e)	c. into the appropriate holes.
4. Attach the interface and power cables (a)	d. on each side.

5. Notice the memory banks have a white chip. (d)	e. the red or pink strip.
6. Place your screws (c)	f. on top of the slot.

6 Use the words given to complete the following sentences.

applicable * solution * wheel * greater * detailed* resume * retrieve * portion

1- A programmer must translate the algorithm or flowchart into a computer program by writing ….applicable…… instructions for the computer, using one of the many available computer languages.

2- In order for developing a flowchart successfully, a programmer should be aware of the sequence of steps required to obtain a correct ….detailed…….. to a problem.

3- It matters not how simple or complex the data-processing operation is, the final results must be made available in a form ..portion…… by human beings.

4- A daisy wheel printer applies a ….wheel…… with up to one hundred characters, each of which is on an individual arm.

5- The arithmetic logical unit is that ….Solution…… of the computer in which the actual arithmetic operations are performed.

6- When an interrupt occurs, the computer stores enough information about the job in process to ....retrive..... operation after it has responded to the interruption.

7- The CPU can also ...resume..... information from memory and can store the results of manipulations back into the memory unit for later reference.

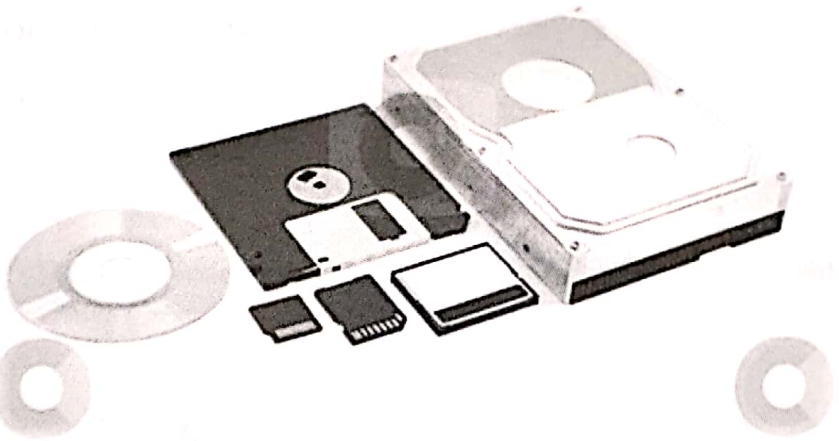
8- The decisions that can be made are whether a number is ...greater..... than, equal to, or less than another number.

7 Match the following words in column A with their definitions in column B.

A	B
...g.. 1- User	a-Devices used with the computer for input and output purposes.
...e... 2- Screen	b- Maintaining the information inputted to the computer by performing arithmetic or logical operations.
...f.... 3- Specifications	c- Writing programs for a computer.
...a.. 4- Peripherals	d- A list of instructions used by a computer to solve a problem.
...c... 5- Programming	e- The part of a visual display unit on which the program, data and graphics are seen.
...d.. 6- Program	f- Detailed description of solutions to problems given by

	the analyst to the programmer to be translated into a program.
..b... 7- **Processing**	g- An individual who makes use of the output of a computer.

Unit 4 – Storage Devices



A storage device is a hardware device capable of storing information. There are two types of storage devices used in computers: a primary storage device such as computer RAM and a secondary storage device such as a computer hard disk drive.

Primary Storage

Primary storage (or main memory or internal memory), often referred to simply as memory, is the only one directly accessible to the CPU. The CPU continuously reads instructions stored there and executes them as required. Any data actively operated on is also stored there in uniform manner. This led to modern random-access memory (RAM). It is small-sized, light, but quite expensive at the same time. (The particular types of RAM used for primary storage are also volatile, i.e. they lose the information when not powered).

Main memory is directly or indirectly connected to the central processing unit via a memory bus. It is actually two buses (not on the diagram): an address bus and a data bus. The CPU firstly sends a number through an address bus, a number called memory address that indicates the desired location of data. Then it reads or writes the data itself using the data bus.

As the RAM types used for primary storage are volatile (cleared at start up), a computer containing only such storage would not have a source to read instructions from, in order to start the computer. Hence, non-volatile primary storage containing a small startup program (BIOS) is used to bootstrap the computer, that is, to read a larger program from non-volatile secondary storage to RAM and start to execute it. A non-volatile technology used for this purpose is called ROM, for read-only memory.

Secondary Storage

Secondary storage (also known as external memory or auxiliary storage) differs from primary storage in that it is not directly accessible by the CPU. The computer usually uses its input/output channels to access secondary storage and transfers the desired data using intermediate area in primary storage. Secondary storage does not lose the data when the device is powered down-it is non-volatile. Consequently, modern computer systems typically have two orders of magnitude more secondary storage than primary storage and data is kept for a longer time there.

In modern computers, hard disk drives are usually used as secondary storage. The time taken to access a given byte of information stored on a hard disk is typically a few thousandths of a second, or milliseconds. By contrast, the time

taken to access a given byte of information stored in random access memory is measured in billionths of a second, or nanoseconds.

The secondary storage is often formatted according to a file system format, which provides the abstraction necessary to organize data into files and directories, providing also additional information (called metadata) describing the owner of a certain file, the access time, the access permissions, and other information.

Most computer operating systems use the concept of virtual memory, allowing utilization of more primary storage capacity than is physically available in the system. As the primary memory fills up, the system moves the least-used chunks (pages) to secondary storage devices (to a swap file or page file), retrieving them later when they are needed. As more of these retrievals from slower secondary storage are necessary, the more the overall system performance is degraded.

Tertiary Storage

Tertiary storage or tertiary memory provides a third level of storage. Typically it involves a robotic mechanism which will mount (insert) and dismount removable mass storage media into a storage device according to the system demands; this data is often copied to secondary storage before use. It is primarily used for archival of rarely accessed information since it is much slower than secondary storage (e.g. 5–60 seconds vs. 1-10 milliseconds). This is primarily useful for extraordinarily large data stores, accessed without human operators. Typical examples include tape libraries and optical jukeboxes.

Off-line Storage

Off-line storage is computer data storage on a medium or a device that is not under the control of a processing unit. The medium is recorded, usually in a secondary or tertiary storage device, and then physically removed or disconnected. It must be inserted or connected by a human operator before a computer can access it again. Unlike tertiary storage, it cannot be accessed without human interaction.

Off-line storage is used to transfer information, since the detached medium can be easily physically transported. Additionally, in case a disaster, for example a fire, destroys the original data, a medium in a remote location will probably be unaffected, enabling disaster recovery.

In modern personal computers, most secondary and tertiary storage media are also used for off-line storage. Optical discs and flash memory devices are most popular, and to much lesser extent removable hard disk drives. In enterprise uses, magnetic tape is predominant. Older examples are floppy disks, zip disks, or punched cards.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

(T) / F 1. A storage device can store information.

T / F 2. A memory bus connects main memory to the control processing unit.

T / (F) 3. RAM is ~~big~~ Small and expensive.

T / (F) 4. Secondary storage is ~~the same as~~ different from primary storage.

(T) / F 5. In a very short time we can have access to the information stored on a hard disk in modern computers.

T / F 6. When it is necessary, the system transfers the most used pages to secondary cannot be accessed without human interaction.

T / (F) 7. Tertiary storage ~~cannot~~ be accessed without human interaction.

(T) / F 8. In modern PC's most secondary storage media can be used for off-line storage.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What are RAM and hard disk drive?

2. How many memory buses do we have? Name them.

3. What does it mean by volatile and non-volatile technology?

4. How does a computer access secondary storage?

5. What does a computer do when the primary memory fills up?

6. What is the third level of storage?

3 Here are some <u>definitions</u> for some of the words in the text. You should look at the text and try to find the words and write them down in the space provided.

1. Computer data storage on a medium that is not under the control of a processing unit: ...offline....Storage..... .

2. A hardware device which is capable of storing information: .....Storage..device..... .

3. It is directly or indirectly connected to the central processing unit via a memory bus: ..main..memory.../..primary..Storage .

4. It differs from primary storage in that it is not directly accessible by the CPU: ....Secondary...Storage..... .

4 Find a word from the text to fill the blanks to complete the sentences.

1. In case of a fire, a ....medium..... in a remote location can enable disaster recovery.

2. ....Virtual..... memory allows the utilization of more primary storage capacity.

3. According to a file system .....format....., the secondary storage is often formatted.

4. Secondary storage keeps the .....data..... when the device is powered down.

5. Off-line storage is computer .....data..... storage on a device.

5 Refer back to the text and try to find <u>antonyms</u> (words with opposite meanings) for the following words.

1. primary: ≠ Secondary
2. store: ≠ lose
3. volatile: ≠ non-volatile
4. dismount: ≠ mount
5. connected: ≠ disconnected

6 **Use the words given to complete the following sentences.**

errors * substance * line * CPU * space * segment * copy * instruction

1- The control unit operates by reading one.....instruction.....at a time from memory.

2- The .....CPU..... coordinates all the activities of the various components of the computer.

3- Since computers must process vast quantities of data and programs, a lot of storage .....Space..... is required.

4- All disks are made of a .....Substance..... coated with metal oxide, and can therefore be magnetized.

5- Printed output, which is the most common one, consists of characters within a .....Segment....., and lines on a page.

6- In a line printer, the character going to be printed is on a cylinder where each .....Line..... has the full set of characters in raised form around its edge.

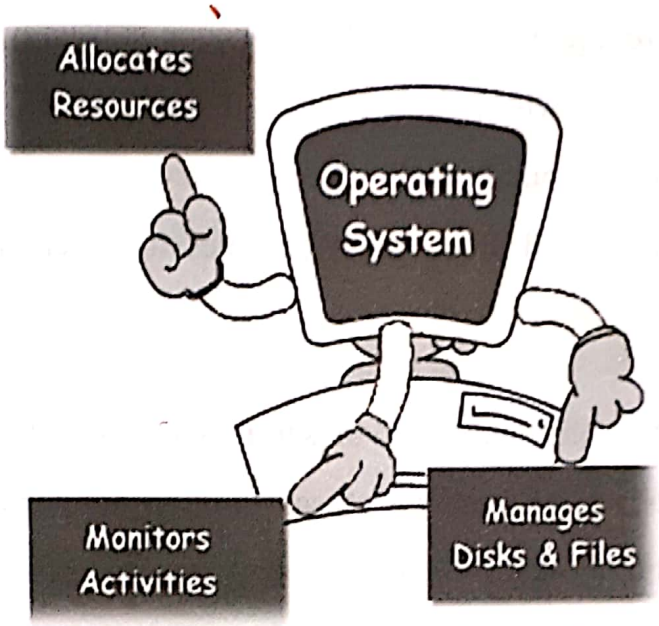
7- If a finished program does not run as it should, the ....errors.....are more easily detected on the flowchart.

8- A program is usually written down and kept with a .....copy..... of the flowchart along with detailed instructions after it has been worked out.

7 Match the following words in column A with their definitions in column B.

A	B
...b.. 1- Transactions	a- A device at which data is inputted to a computer or results outputted onto a screen or paper.
...e.. 2- Real time	b- An event requiring the creation of a record, the updating of a file or its processing.
...g.. 3- On-line	c- A program written for the computer system usually provided by the manufacturer.
...c.. 4- Systems program	d- The use of a computerized typewriter for automating some secretarial tasks such as typing letters.
...f.. 5- Output	e- It is the time when a user can interact with a computer by asking it to perform a desired task and have the task completed within a matter of seconds.
..a... 6- Terminal	f- The obtained results of performing arithmetic and logical operations on data.
..d... 7- Word processing	g- Any part of a computer system hooked up to and controlled by the central processing unit.

Unit 5 - Operating System



What is an Operating System?

An operating system (OS) is software, consisting of programs and data that runs on computers and manages computer hardware resources and provides common services for efficient execution of various application software. In other words, the software component of a computer system is responsible for the management and coordination of activities and the sharing of the resources of the computer. The operating system (OS) acts as a host for application programs that are run on the machine. As a host, one of the purposes of an operating system is to handle the details of the operation of the hardware. This relieves application programs from having to manage these details and makes it easier to write applications. Almost all computers, including hand-held

computers, desktop computers, supercomputers, and even modern video game consoles use an operating system of some type.

For hardware functions such as input and output and memory allocation, the operating system acts as an intermediary between application programs and the computer hardware, although the application code is usually executed directly by the hardware, but will frequently call the OS or be interrupted by it. Operating systems are found on almost any device that contains a computer—from cellular phones and video game consoles to supercomputers and web servers.

Operating systems offer a number of services to application programs and users. Applications access these services through application programming interfaces (APIs) or system calls. By invoking these interfaces, the application can request a service from the operating system, pass parameters, and receive the results of the operation. Users may also interact with the operating system by typing commands or using a graphical user interface (GUI). For hand-held and desktop computers, the GUI is generally considered part of the operating system. For large multiuser systems, the GUI is generally implemented as an application program that runs outside the operating system.

Modern Operating Systems

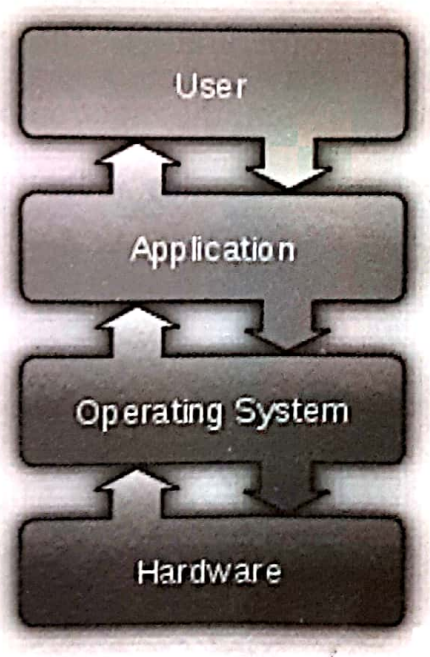
Modern operating systems provide the capability of running multiple application programs simultaneously, which is referred to as *multi-tasking*. Each program running is represented by a process in the operating system. The operating system provides an execution environment for each process by sharing the hardware resources so that each application does not need to be

aware of the execution of other processes. The central processing unit (CPU) of the computer can be used by only one program at a time. The operating system can share the CPU among the processes by using a technique known as time slicing. In this manner, the processes take turns using the CPU. Single-user desktop personal computers (PCs) may simplify this further by granting the CPU to whichever application the user has currently selected and allowing the user to switch between applications at will.

Operating System Responsibilities

The main memory of a computer (referred to as random access memory, or RAM) is a finite resource. The operating system is responsible for sharing the memory among the currently running processes. When a user initiates an application, the operating system decides where to place it in memory and may allocate additional memory to the application if it requests it. The operating system may use capabilities in the hardware to prevent one application from overwriting the memory of another. This provides security and prevents applications from interfering with one another.

The details of device management are left to the operating system. The operating system provides a set of APIs to the applications for accessing input/output (I/O) devices in a consistent and relatively simple manner regardless of the specifics of the underlying hardware. The operating system itself will generally use a software component called a



device driver to control an I/O device. This allows the operating system to be upgraded to support new devices as they become available. In addition to a device driver for the network I/O device, the operating system includes software known as a network protocol and makes various network utilities available to the user.

Operating systems provide security by preventing unauthorized access to the computer's resources. Many operating systems also prevent users of a computer from accidentally or intentionally interfering with each other. The security policies that an operating system enforces range from none in the case of a video game console, to simple password protection for hand-held and desktop computers, to very elaborate schemes for use in high-security environments.

Computer program allows users to enter and run their software packages in computer. The operating system allows the machine to recognize and carry out the accountant's command. Further, there are built-in routines permitting the user's software to conduct input-output operations without specifying the exact hardware configuration. The operating system normally consists of the job control program, the input/output control system, and the processing program. If a computer operates under one system, it cannot use programs designated for a different operating system.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

(T)/ F 1. An operating system is software managing computer hardware resources.

(T)/ F 2. OS stands for Operating System.

T /(F)3. Hardware uses application code ~~in~~directly.

T /(F)4. GUI is ~~not~~ a part of the operating system.

(T)/ F 5. Operating systems can be formed on any device.

T /(F)6. CPU can be used by different programs each time.

(T)/ F 7. Memory does not know where to put an application by itself.

(T)/ F 8. The security policies enforced by an operating system on a video game console are none.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

What is one of the purposes of an operating system as a host?

2. Where can operating systems be found?

3. How many users interact with the operating system?

4. What is time slicing technique?

5. What is the range of the security policies that an operating system enforces?

6. What programs does the operating system normally consist of?

3 Find a word from the text to fill the blanks to complete the sentences.

1. Operating program can prevent ..unauthorized..... access to the resources.

2. Routines letting the user's software conduct input-output operations not specifying the exact hardware configuration are ...build-in.... routines.

3. Random access memory, or ...RAM..... is the main memory of a computer.
4. By typing commands, ...users..... can have interaction with the operating system.

5. Cellular phone is a ....device..... on which operating systems can be found if it contains a computer.

4 Give a definition for each of the words below.

X

1. RAM: random access memory
2. a device driver:
3. an operating system:
4. system calls:
5. multi-tasking:

5 Use the words given to complete the following sentences.

spinning * conclusion * readable * circuitry * languages* wait * revolution * classifying

1- There are two ways of making a flowchart: one is the freehand version and two is the neater, which is more .....classifying..... a version.

2- Instructions are first written in one of the high-level ..languages.., depending on the type of problem to be solved.

3- In real time processing, the user doesn't have to ....wait..... long to receive answers to his or her other questions.

4- The vast majority of computers nowadays are used for storing, ...readable..... sorting, cataloguing, and retrieving information of all kinds.

5- The nature of work is changing because of the ....revelution..... brought about by computers.

6- By examining existing data, a logical .....Conclution..... can often be logically drawn about what is likely to happen next.

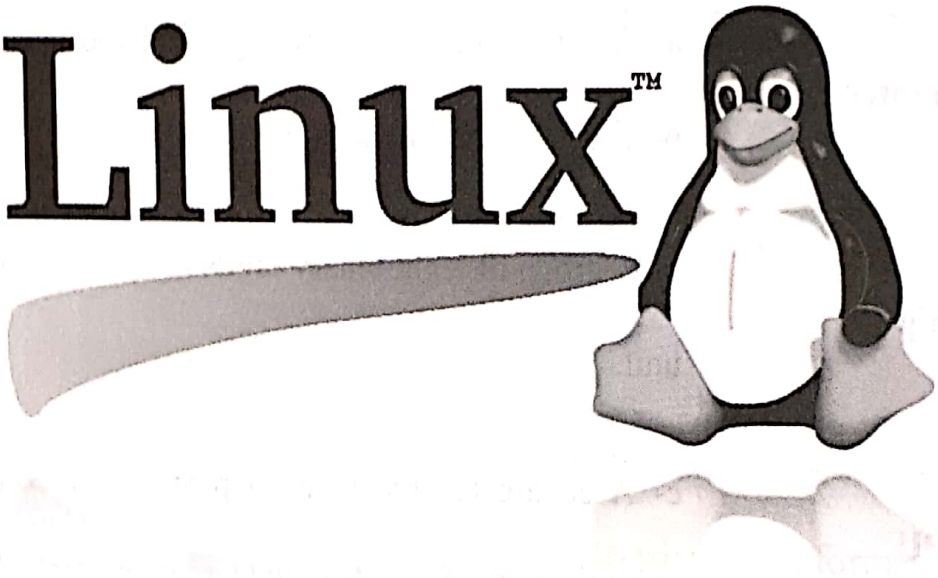
7- Disks are kept .....Spinning..... at a very high and constant speed, thus allowing the recording heads to have direct access to the required information.

8- The logical unit consists of electronic .....circuitry..... which compares information and makes decisions based upon the results of the comparison.

6 Match the following words in column A with their definitions in column B.

A	B
..g.. 1- Counter	a- A high-level programming language used mostly for writing programs in conversational mode.
...c... 2- Chip	b- A group of eight binary digits or bits considered as one unit.
..e... 3- CPU	c- A square (or rectangular) piece of silicon on which several layers of an integrated circuit are etched.
..a... 4- Basic	d- The representation of information, data and instructions in symbolic language.
...f... 5- Bits	e- The brain of a computer which controls and carries out instructions given to the computer.
...b... 6- Byte	f- Binary digit which is 0 or 1.
..d... 7- Code	g- A component of the control unit, which selects instructions, one at a time from memory.

Unit 6 - Linux



What is Linux?

Linux is, in simplest terms, an operating system. Linux is a free open source operating system similar to the UNIX operating system which has been around for decades. Red Hat and Ubuntu are two of the most popular distributions others include *Debian*, *Suse*, *Mandrake*, and more. Linux is known for robustness; it's used in mission-critical tasks by many industries. It can cost nothing to download and install, or you may choose to have a vendor configure and support it for you. Linux is a free Unix-type operating system originally created by Linus Torvalds with the assistance of developers around the world. Developed under the GNU General Public License, the source code for Linux is freely available to everyone.

As an open operating system, Linux is developed collaboratively, meaning no one company is solely responsible for its development or ongoing support.

Companies participating in the Linux economy share research and development costs with their partners and competitors. This spreading of development burden amongst individuals and companies has resulted in a large and efficient ecosystem and unheralded software innovation.

Linux Features

The primary difference between Linux and many other popular contemporary operating systems such as Windows is that the Linux kernel and other components are free and open source software. Linux is not the only such operating system, although it is by far the most widely used. Some free and open source software licenses are based on the principle of *copyleft*, a kind of reciprocity: any work derived from a *copyleft* piece of software must also be *copyleft* itself. The most common free software license, the GNU GPL, is a form of *copyleft*, and is used for the Linux kernel and many of the components from the GNU project.

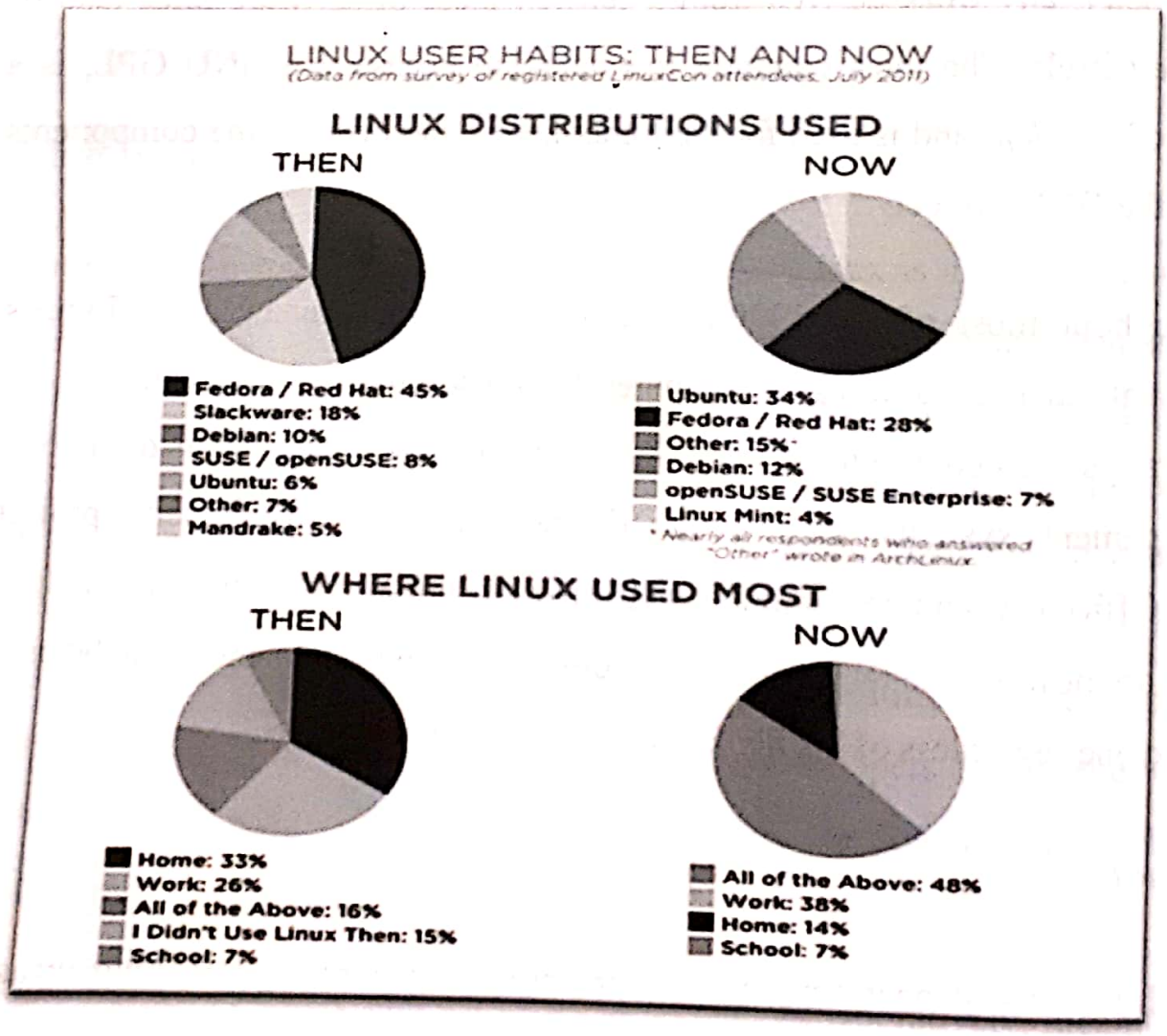
Throughout most of the 1990's, tech pundits, largely unaware of Linux's potential, dismissed it as a computer hobbyist project, unsuitable for the general public's computing needs. Through the efforts of developers of desktop management systems such as KDE and GNOME, office suite project OpenOffice.org and the Mozilla web browser project, to name only a few, there are now a wide range of applications that run on Linux and it can be used by anyone regardless of his/her knowledge of computers.

Kernel

The Linux set of operating systems are great and good at deflecting viruses. Linux is an operating system whose core is a most unusual piece of software

called a "kernel". The kernel and fundamentals of the operating system (OS) were developed by *Linus Torvalds*.

Torvalds wanted to create a free, open-source OS based on the previously common UNIX OS. Linux has now developed much further; it has evolved into many things for many uses. You could say a type of Linux would be called a distribution such as Ubuntu, Suse, Debian and etc. There are other distributions called "live" distributions that are used to try out Linux, restore a computer, partition a hard drive, and several other good uses. A popular "live" distribution of Linux is called *Knoppix*.



EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. Linux is the same as UNIX.

T / F 2. Linux is very expensive.

T / F 3. Its source code is available for everybody just for a little money.

T / F 4. Linux is a software innovation.

T / F 5. Windows is free and open source software like the Linux kernel.

T / F 6. Linux has few users.

T / F 7. Knoppix is a popular live distribution of Linux.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is Linux?

2. What is the most common free software license?

3. Should all those who use Linux have high education?

4. What is kernel?

5. What are live distributions used for?

6. How many companies have been responsible for the development of Linux?

3 Find a word from the text to fill the blanks to complete the sentences.

1. Linux is a free ..... system.

2. Linux is by far the most widely ..... operating system.

3. The kernel and fundamentals of the ..... were made by Linus Torvalds.

4. Ubuntu, Suse and Debian are a type of .....

5. A wide range of ..... running on Linux can be used by anyone.

4 Refer back to the text and try to find <u>antonyms</u> (words with opposite meanings) for the following words.

1. copyright:
2. aware:
3. heralded:
4. regarding:
5. unavailable:
6. upload:
7. uninstalled:

5 Use the words given to complete the following sentences.

various * derive * switches * medium * access * position * analytical * systems

1- The operating systems of minis usually provide system ..... to either a single user or to a limited number of users at a time.

2- The control unit and the arithmetic logical unit are made up of electronic circuits with millions of ..... that can be in one of two states, either on or off.

3- Sequential devices permit information to be written onto or read off some storage ..... in a fixed sequence only.

4- As each cylinder spins into the appropriate character ....., it is hammered onto a paper through a carbon ribbon.

5- Data processing refers to the operations performed on the data either to ..... information or to order them in files.

6- It is through a flowchart that a new programmer reveals his or her logical and ..... ability, which is a must in programming.

7- Multiprogramming is when more than one program can be present at ..... storage locations of the memory at the same time.

8- Specifications for the data processing problems are given to the computer by the ..... analyst.

6 Match the following words in column A with their definitions in column B.

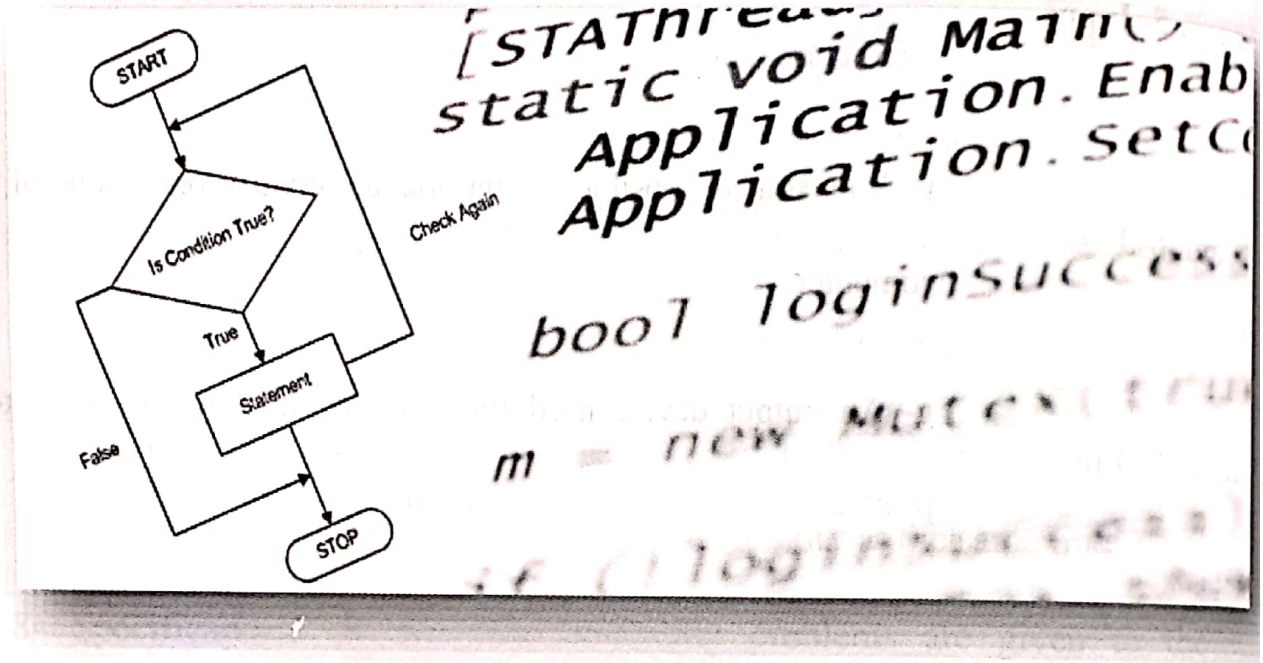
A	B
..... **1- Printer**	a- A number having only one character, 0, 1, 2, 3, 4, 5, 6, 7, 8 or 9.
..... **2- Operator**	b- A storage device made up of one or more circular plates which can be magnetized on both sides.

..... 3- Digit	c- A group of blocks.
..... 4- Mouse	d- The information presented to the computer.
..... 5- Input	e- A small hand-held input device, which is often used with microcomputers.
..... 6- Disk	f- A person responsible for the manual control operations of a computer.
..... 7- File	g- An output device used for changing the output data into printed form.

7 Translate into Persian

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Google Inc. purchased the initial developer of the software, Android Inc., in 2005. Android's mobile operating system is based on the Linux kernel. Google and other members of the Open Handset Alliance collaborated on Android's development and release. The Android operating system is used on smartphones, netbooks, tablets, Google TV, and other devices.

Unit 7 - Computer Programming



A Definition of Computer Programming

Computer programming (often shortened to programming or coding) is the process of designing, writing, testing, debugging / troubleshooting, and maintaining the source code of computer programs. This source code is written in a programming language. The purpose of programming is to create a program that exhibits a certain desired behavior. The process of writing source code often requires expertise in many different subjects, including knowledge of the application domain, specialized algorithms and formal logic.

Hoc and *Nguyen-Xuan* define computer programming as "the process of transforming a mental plan in familiar terms into one compatible with the

computer". Said another way, programming is the craft of transforming requirements into something that a computer can execute.

Within software engineering, programming (the implementation) is regarded as one phase in a software development process. There is an ongoing debate on the extent to which the writing of programs is an art, a craft or an engineering discipline. In general, good programming is considered to be the measured application of all three, with the goal of producing an efficient and evolvable software solution (the criteria for "efficient" and "evolvable" vary considerably).

The discipline differs from many other technical professions in that programmers, in general, do not need to be licensed or pass any standardized (or governmentally regulated) certification tests in order to call themselves "programmers" or even "software engineers." However, representing oneself as a "Professional Software Engineer" without a license from an accredited institution is illegal in many parts of the world. However, because the discipline covers many areas, which may or may not include critical applications, it is debatable whether licensing is required for the profession as a whole. In most cases, the discipline is self-governed by the entities which require the programming, and sometimes very strict environments are defined.

History

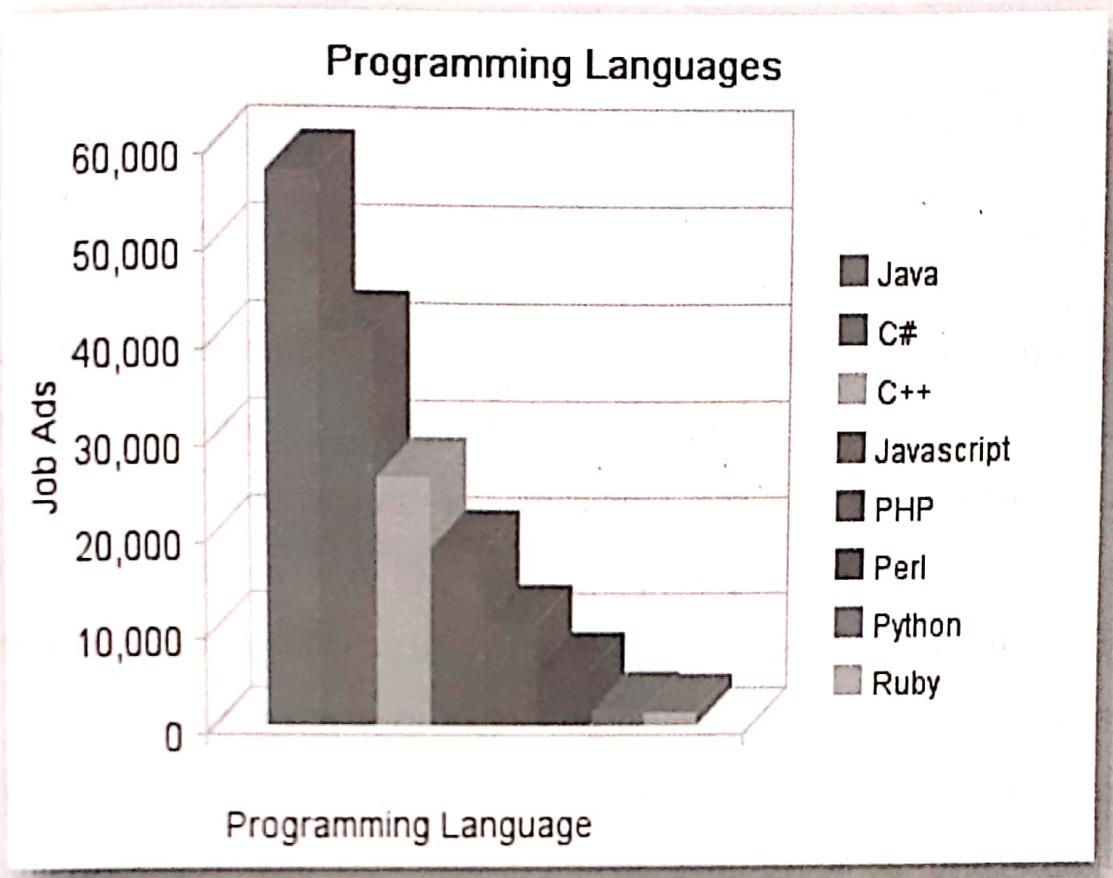
In 1954, FORTRAN was invented; it was the first high level programming language to have a functional implementation. A high-level language is, in very general terms, any programming language that allows the programmer to write programs in terms that are more abstract than assembly language

instructions, i.e. at a level of abstraction "higher" than that of an assembly language. It allowed programmers to specify calculations by entering a formula. The program text, or source, is converted into machine instructions using a special program called a *compiler*, which translates the FORTRAN program into machine language. In fact, the name FORTRAN stands for "Formula Translation". Many other languages were developed, including some for commercial programming, such as COBOL. Programs were mostly still entered using punched cards or paper tape. By the late 1960s, data storage devices and computer terminals became inexpensive enough that programs could be created by typing directly into the computers. Text editors were developed that allowed changes and corrections to be made much more easily than with punched cards.

Modern Programming

It is very difficult to determine what are the most popular of modern programming languages. Some languages are very popular for particular kinds of applications (e.g., COBOL is still strong in the corporate data center, often on large mainframes, FORTRAN in engineering applications, *scripting* languages in web development, and C in *embedded* applications), while some languages are regularly used to write many different kinds of applications such as C#.

Methods of measuring programming language popularity include: counting the number of job advertisements that mention the language, the number of books teaching the language that are sold (this overestimates the importance of newer languages), and estimates of the number of existing lines of code written in the language.



Debugging

Debugging is a very important task in the software development process, because an incorrect program can have significant consequences for its users. Some languages are more prone to some kinds of faults because their specification does not require compilers to perform as much checking as other languages. Debugging is often done with IDEs like Eclipse, NetBeans, and Visual Studio.

Different programming languages support different styles of programming (called programming paradigms). The choice of language used is subject to many considerations, such as company policy, suitability to task, availability of third-party packages, or individual preference. Languages form an approximate

spectrum from "low-level" to "high-level"; "low-level" languages are typically more machine-oriented and faster to execute, whereas "high-level" languages are more abstract and easier to use but execute less quickly.

Programmers

Computer programmers are those who write computer software. A programmer, computer programmer or coder is someone who writes computer software. The term computer programmer can refer to a specialist in one area of computer programming or to a generalist who writes code for many kinds of software. One who practices or professes a formal approach to programming may also be known as a programmer analyst. A programmer's primary computer language (C, C++, Java, Lisp, Delphi etc.) is often prefixed to the above titles, and those who work in a web environment often prefix their titles with web. The term programmer can be used to refer to a software developer, software engineer, computer scientist, or software analyst.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / (F) 1. Formal logic is ~~never~~ needed in the process of writing source code.

T / F 2. There are different definitions for programming.

T / F 3. Generally, writing programs is an engineering discipline.

T / F 4. Anyone called as a Professional Software Engineer must have a license from an accredited institution in many countries.

T / F 5. Compiler translates the FORTRAN program into machine language.

T / F 6. Each language is very popular for special kind of application.

T / F 7. There are methods of measuring programming language popularity.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is coding a short form for?

2. What is computer programming?

3. What is the purpose of programming?

4. What is a high-level language?

5. How can source be converted into machine instructions?

6. Who is a coder?

3 Find a word from the text to fill the blanks to complete the sentences.

1. FORTRAN was the first high level ....programming..... language.
2. Formula Translation is the complete forms of .....FORTRAN.....

3. There were ..text..editors... developed for changing and correcting texts.

4. In the software development process, ...debugging.... is a very important task.

5. Computer software is written by .....programer.....

4 Use the words given to complete the following sentences.

rate * satisfactory * forth * specialized * telecommunication * trainee * locations * advantages

1- People may stop commuting long distances to offices, and work at home instead, using microcomputers to write reports, articles and books, sending them via ...telecommunication.... links to central computers when finished.

2- The career of a programmer can start as a ....trainee..... in a data processing department after a course in computer programming.

3- A computer is a very expensive machine which is capable of executing jobs at an extremely fast .....rate.....

4- The freehand version is quite ....Satisfactory..... if the flowchart is not intended to be kept as a permanent record.

5- Relative low cost, high-speed, and quiet operation are the general ...advantages.. of using matrix printers.

6- To access information from a disk pack, the recording heads are moved back and .....forth..... in the space between the platters by the access arms to which they are attached.

7- The term memory is usually used to refer to the internal storage ...locations..... of a computer.

8- Software can also be written for ...Specialized..... tasks even as complex as navigating rockets.

5 Match the following words in column A with their definitions in column B.

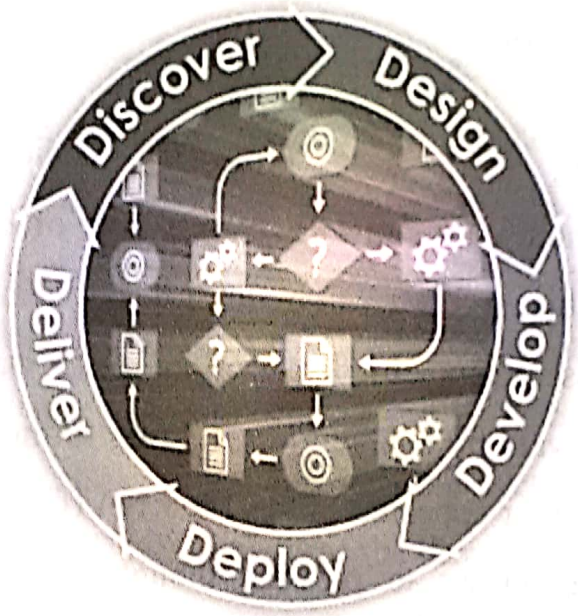
A	B
...d... **1- Secondary memory**	a- A computer whose mainframe is physically small, and has a fixed word length between eight and thirty two bits.
...e... **2- Programmer**	b- A large computer system found in large

	installations processing large amounts of data.
....f.. 3- Pack	c- The programs controlling and coordinating the activities of the computer hardware and directing the processing of the data.
...g.. 4- Bugs	d- Storage space outside the main memory of a computer.
...a... 5- Minicomputer	e- A person who prepares the instructions for a computer.
...c... 6- Software	f- A hard disk made up of a number of platters.
..b... 7- Mainframe	g- The errors of a program.

6 Translate into Persian

An implementation of a programming language provides a way to execute that program on one or more configurations of hardware and software. There are, broadly, two approaches to programming language implementation: compilation and interpretation. It is generally possible to implement a language using either technique. The output of a compiler may be executed by hardware or a program called an interpreter. In some implementations that make use of the interpreter approach there is no distinct boundary between compiling and interpreting. For instance, some implementations of BASIC compile and then execute the source a line at a time. Programs that are executed directly on the hardware usually run several orders of magnitude faster than those that are interpreted in software. One technique for improving the performance of interpreted programs is just-in-time compilation.

Unit 8 - Software Engineering



What is Software?

A software system consists of executable computer code and the supporting documents needed to manufacture, use, and maintain the code. For example, a word processing system consists of an executable program (the word processor), user manuals, and the documents, such as requirements and designs, needed to produce the executable program and manuals. Software engineering is ever more important as larger, more complex, and life-critical software systems proliferate. The rapid decline in the costs of computer hardware means that the software in a typical system often costs more than the hardware it runs on. Large software systems may be the most complex things ever built. This places great demands on the software engineering process, which must be disciplined and controlled. To meet this challenge, software

engineers have adapted many techniques from older engineering fields, as well as developing new ones. For example, dividing and conquering a well-known technique for handling complex problems is used in many ways in software engineering.

Software Engineering

Software engineering (SE) is a profession dedicated to designing, implementing, and modifying software so that it is of higher quality, more affordable, maintainable, and faster to build. It is a systematic approach to the analysis, design, assessment, implementation, test, maintenance and re-engineering of a software by applying engineering to the software. The term software engineering first appeared in the 1968 NATO Software Engineering Conference, and was meant to provoke thought regarding the perceived "software crisis" at the time. Since the field is still relatively young compared to its sister fields of engineering, there is still much debate around what software engineering actually is, and if it conforms to the classical definition of engineering. The IEEE Computer Society's Software Engineering Body of Knowledge defines "software engineering" as the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software, and the study of these approaches; that is, the application of engineering to software. It is the application of Engineering to software because it integrates significant mathematics, computer science and practices whose origins are in Engineering.

Software Engineering Phases

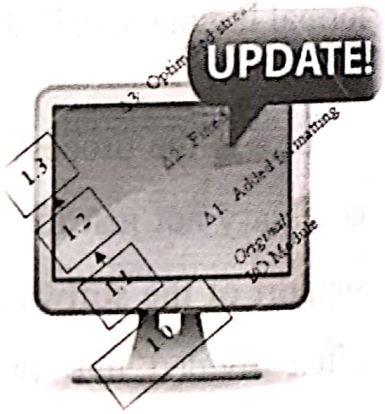
The software engineering process itself, for example, is usually divided into phases. The definition of these phases, their ordering, and the interactions between the phases specify a software life-cycle model. One of the life-cycle models is the waterfall model consisting of a requirements definition phase, a design phase, a coding phase, a testing phase, and a maintenance phase. The output of each phase serves as the input to the next. The purpose of the requirements phase is to define what a system should do and the constraints under which it must operate. This information is recorded in a requirements document. In the design phase, a plan is developed for how the system will implement the requirements. The plan is expressed using a design method and notation. The coding phase of the software life-cycle is concerned with the development of code that will implement the design. This code is written is a formal language called a programming language.

Testing is the process of examining a software product to find errors. This is necessary not just for code but for all life-cycle products and all documents in support of the software such as user manuals. The software testing process is often divided into two phases. The first phase is unit testing of software developed by a single programmer. The second phase is integration testing where units are combined and tested as a group. System testing is done on the entire system, usually with test cases developed from the system requirements. Acceptance testing of the system is done by its intended users.

Large software systems are not static; rather, they change frequently both during development and after deployment. Maintenance is the phase of the software life-cycle after deployment.

Maintenance consists of three activities: adaptation, correction, and enhancement. Enhancement is the process of adding new functionality to a system. This is usually done at the request of system users. This activity requires a full life-cycle of its own. That is, enhancements demand requirements, design, implementation, and test. Studies have shown that about half of maintenance effort is spent on enhancements.

Adaptive maintenance is the process of changing a system to adapt it to a new operating environment, for example, moving a system from the Windows operating system to the Linux operating system. Adaptive maintenance has been found to account for about a quarter of total maintenance effort. Corrective maintenance is the process of fixing errors in a system after release.



Version

Since software systems change frequently over time, an important activity is software configuration management. This consists of tracking versions of life-cycle objects, controlling changes to them, and monitoring relationships among them. Configuration management activities include version control, which involves keeping track of versions of life-cycle objects; change control, an orderly process of handling change requests to a system; and build control, the tracking of which versions of work products go together to form a given version of a software product.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. A decline in the costs of hardware can mean an increase of costs in the software running the hardware.

T / F 2. The software engineering process has phases.

T / F 3. Waterfall is one of the life-cycle models.

T / F 4. There is no need for a plan to be developed in the design phase.

T / F 5. In order to find errors, the process of examining a software product is used.

T / F 6. Large software systems are not frequently changed.

T / F 7. All of the effort has been on enhancement.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is meant by software engineering?

2. What does a word processing system consist of?

3. What specifies a software life-cycle model?

4. What is the purpose of the requirements phase?
5. What is a programming language?

6. What is adaptive maintenance?

3 Find a word from the text to fill the blanks to complete the sentences.

1. The output of each ..... acts as the input to the next.

2. System testing is done on the ..... system.

3. Great demands are placed on the software ..... process.

4. Software engineers have also developed new.....

5. Adaptation, correction, and enhancement are three activities in the ..... process.

4 By using the words provided, complete the sentences according to the passage.

quantifiable – requirements – affordable – implementation – user manuals – design – modifying – re-engineering

1. SE is a profession dedicated to designing, implementing and..... software.
2. SE is of higher quality, more ....., maintainable and faster to build.
3. SE is a systematic approach to the analysis, ..., assessment, ..., test, maintenance and ..... of a software.
4. SE is the application of a systematic, disciplined, ... approach.
5. A word processing system consists of an executable program (the word processor), ..., and the documents.
6. Enhancements demand ....., design, implementation and test.

5 Use the words given to complete the following sentences.

mainframes * response * started * circuit * complex * punched * mathematical * machine

1- The processor, memory and electronic controls for the peripheral equipment are usually put together on a single or on a few printed ..... boards.

2- The console is used mainly when the computer is being ..... up, or during maintenance and repair.

3- Most people are very surprised to find that ..... cards were used long ago on textile machinery.

4- Printed output produces a ..... from the reader much like that of people to a roomful of new furniture.

5- The functions of a computer are to perform arithmetic and logical operations on the program and data after they have been translated to ..... code.

6- FORTRAN is used for solving scientific and ..... problems.

7- The electronic computer began life during the Second World War as a high-powered calculating machine for dealing with ..... mathematical problems.

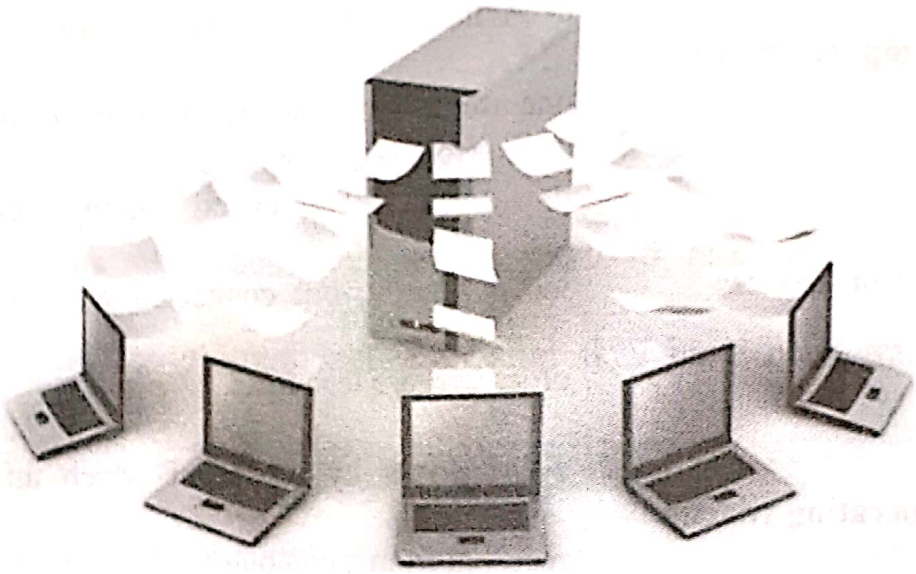
8- In a network, each terminal is a computer in its own right, sometimes with as much memory as older .....

6 Match the following words in column A with their definitions in column B.

A	B
..... 1- Network	a- Computer carrying out several tasks at the same time, with an operating system.

..... 2- Multiprogramming	b- A systems program controlling the central processing unit, the input, the output and the secondary memory devices.
..... 3- Computer operator	c- A time sharing technique allowing more than one user to share the resources of the computer.
..... 4- Output devices	d- Each of several computers working independently, but connected with each other in order to share resources.
..... 5- Operating systems	e- Machines by means of which information is received from a computer.
..... 6- Multi-tasking	f- It is responsible for carrying out logical-operations on data.
..... 7- Logical unit	g- A person being physically responsible for operating the computer.

Unit 9 – Database



What is a Database?

A database consists of an organized collection of data for one or more uses, typically in digital form. One way of classifying databases involves the type of their contents, for example: bibliographic, document-text, statistical. Digital databases are managed using database management systems, which store database contents, allowing data creation and maintenance, and search and other access. A set of related files that is created and managed by a database management system is called Database management system (DBMS). Today, DBMSs can manage any form of data including text, images, sound and video. Database and file structures are always determined by the software. As far as the hardware is concerned, it is all bits and bytes.

Architecture

Database architecture consists of three levels *external*, *conceptual* and *internal*. Clearly, separating the three levels was a major feature of the relational database model that dominates 21st century databases.

The external level defines how users understand the organization of the data. A single database can have any number of views at the external level. The internal level defines how the data is physically stored and processed by the computing system. Internal architecture is concerned with cost, performance, scalability and other operational matters. The conceptual is a level of indirection between internal and external. It provides a common view of the database that is uncomplicated by details of how the data is stored or managed, and that can unify the various external views into a coherent whole.

Database Management Systems

A database management system (DBMS) consists of software that operates databases, providing storage, access, security, backup and other facilities. Database management systems can be categorized according to the database model that they support, such as relational or XML, the type(s) of computer they support, such as a server cluster or a mobile phone, the query language(s) that access the database, such as SQL or XQuery, performance trade-offs, such as maximum scale or maximum speed or others.

Types of Databases

Operational database

These databases store detailed data about the operations of an organization. They are typically organized by subject matter, process relatively high volumes of updates using transactions. Essentially every major organization on earth uses such databases. Examples include customer databases that record contact, credit, and demographic information about a business' customers, personnel databases that hold information such as salary, benefits, skills data about employees, Enterprise resource planning that record details about product components, parts inventory, and financial databases that keep track of the organization's money, accounting and financial dealings.

Data warehouse

Data warehouses archive modern data from operational databases and often from external sources such as market research firms. Often operational data undergoes transformation on its way into the warehouse, getting summarized, reclassified, etc.

The warehouse becomes the central source of data for use by managers and other end-users who may not have access to operational data. For example, sales data might be aggregated to weekly totals and converted from internal product codes to use UPC codes so that it can be compared with ACNielsen data. Some basic and essential components of data warehousing include retrieving and analyzing data, transforming, loading and managing data so as to make it available for further use.

Analytical database

Analysts may do their work directly against, a data warehouse, or create a separate analytic database for Online Analytical Processing. For example, a

company might extract sales records for analyzing the effectiveness of advertising and other sales promotions at an aggregate level.

Distributed database

These are databases of local work-groups and departments at regional offices, branch offices, manufacturing plants and other work sites. These databases can include segments of both common operational and common user databases, as well as data generated and used only at a user's own site.

End-user database

These databases consist of data developed by individual end-users. Examples of these are collections of documents in spreadsheets, word processing and downloaded files, even managing their personal baseball card collection.

External database

These databases contain data collected for use across multiple organizations, either freely or via subscription. The Internet Movie Database is one example.

Hypermedia databases

The Worldwide web can be thought of as a database, albeit one spread across millions of independent computing systems. Web browsers "process" this data one page at a time, while web crawlers and other software provide the equivalent of database indexes to support search and other activities.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. A database is especially in digital form.

T / F 2. These days DBMS can manage every form of data except images.

T / F 3. The conceptual is a level of indirection between internal and external levels.

T / F 4. Database management systems can be categorized.

T / F 5. If managers don't have access to operational data, they can use data warehouses.

T / F 6. Collections of documents in spreadsheets, word processing and downloaded files are examples of distributed database.

T / F 7. Data warehouses archive data from external sources, too.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What does a database consist of?
2. Can the contents of databases be important in their classification?
3. What is DBMS?
4. Can you write the three levels of database architecture?
5. What are types of database?
6. Give an example of external database.

3 Find a word from the text to fill the blanks to complete the sentences.

1. According to the database ....., database management systems can be categorized.
2. Internal architecture is concerned with cost, performance and other ..... matters.
3. In addition to operational data, the ..... can be the central source of data to use by managers and other end-users.
4. The data is processed one page at a time by .....

4 Refer back to the text and with the help of your teacher find the noun form of the words below.

1. manage :
2. organize :
3. collect :
4. subscribe :
5. inform :
6. perform :

5 Use the words given to complete the following sentences.

terminal * hybrid * internal * pack * affect * capability * vendors * separately

1- The growth of the computer will ..... our lives in many ways, apart from business.

2- Batch processing is done on programs which do not require interaction with the computer from a ..... .

3- Software packages are sold by various ..... and not necessarily by the computer manufacturer.

4- It is possible for two programmers, who work ....., to write programs to solve the same problem and come up with programs and flowcharts that may be different altogether.

5- The converging technologies of printers, plotters, and graphic displays have resulted in the creation of a few..... devices capable of doing a lot of things.

6- The recording capacity of a disk ..... is measured in terms of a number of cylinders, the number of tracks, and the amount of data in each track.

7- One of the most important characteristics of a computer is its ..... of storing information in its memory long enough to process it.

8- Computer refers to the central processing unit (CPU) together with an ..... memory.

6 Match the following words in column A with their definitions in column B.

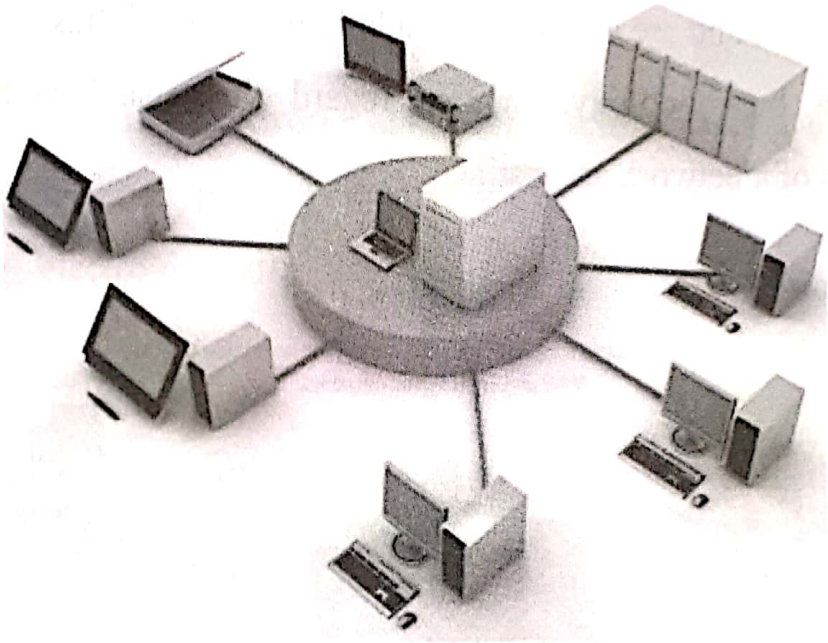
A	B
..... 1- Disk drive	a- The internal storage locations in a computer.
..... 2- Instruction	b- The means by which something is performed.
..... 3- Control Unit	c- A part of a computer program which tell the computer what to do.

……. 4- Fixed application	d- A vertical pattern on the magnetic tape.
……. 5- Memory	e- A device which is capable of transmitting magnetic impulses representing data from the disk to the computer memory and the other way round.
……. 6- Medium	f- It transmits coordinating control signals and commands to the computer.
……. 7- Frame	g- A program which is written to solve one specific problem.

7 Translate into Persian

A Database Management System (DBMS) is a software package with computer programs that control the creation, maintenance, and the use of a database. It allows organizations to conveniently develop databases for various applications by database administrators (DBAs) and other specialists. A database is an integrated collection of data records, files, and other database objects. A DBMS allows different user application programs to concurrently access the same database. DBMSs may use a variety of database models, such as the relational model or object model, to conveniently describe and support applications.

Unit 10 – Networks

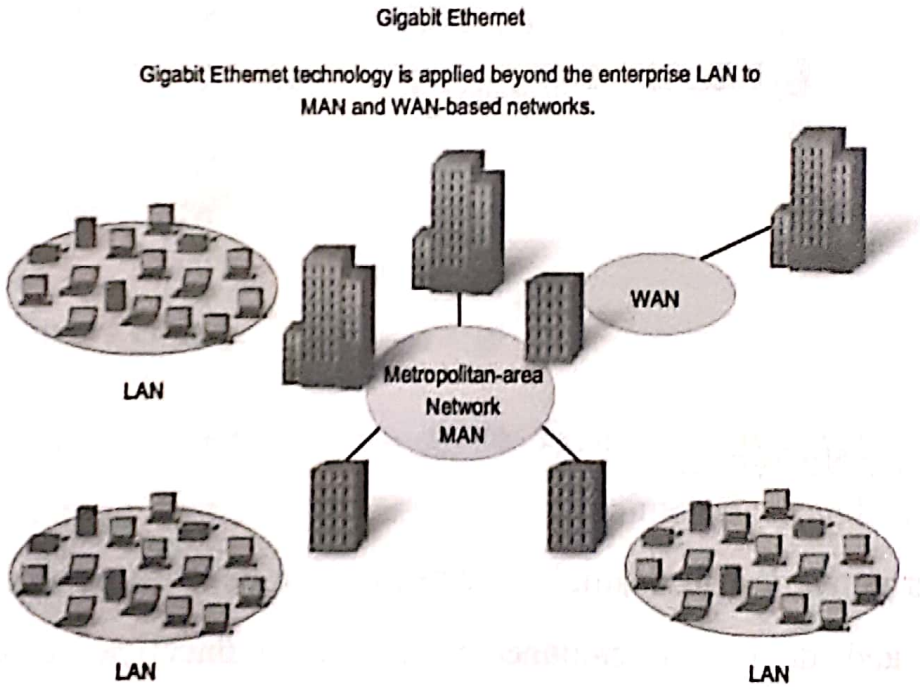


A Computer Network

A computer network, often simply referred to as a network, is a collection of computers and devices interconnected by communications channels that facilitate communications among users and allows users to share resources. Networks may be classified according to a wide variety of characteristics. A computer network allows sharing of resources and information among interconnected devices. Other words a system that transmits any combination of voice, video and/or data between users. The network includes the network operating system in the client and server machines, the cables connecting them and all supporting hardware in between such as bridges, routers and switches. In wireless systems, antennas and towers are also part of the network.

Network Topology

Computer networks may be classified according to the network topology upon which the network is based, such as bus network, star network, ring network, mesh network. Network topology is the coordination by which devices in the network are arranged in their logical relations to one another, independent of physical arrangement. Even if networked computers are physically placed in a linear arrangement and are connected to a hub, the network has a star topology, rather than a bus topology. In this regard the visual and operational characteristics of a network are distinct.



Types of Networks Based on Physical Scope

Network, in computing, two or more computers connected for the purpose of routing, managing, and storing rapidly changing data. A local area network (LAN), which is restricted by distances of up to one mile, and a metropolitan area network (MAN), which is restricted to distances of up to 60 miles,

connect personal computers and workstations (each called a node) over dedicated, private communications links. A wide area network (WAN) connects large numbers of nodes over long-distance communications links, such as common carrier telephone lines, over distances ranging from that between major metropolitan centers to that between continents. An internet is a connection between networks. The Internet is a WAN that connects thousands of disparate networks in the U.S., Canada, Europe, Asia, and elsewhere, providing global communication between nodes on government, educational, and industrial networks. Networks allow for resource sharing (e.g., multiple computers sharing one printer), data sharing, and communication or data exchange (e.g., electronic mail).

Local area network

A local area network (LAN) is a network that connects computers and devices in a limited geographical area such as home, school, computer laboratory, office building, or closely positioned group of buildings. Each computer or device on the network is a node.

Personal area network

A personal area network (PAN) is a computer network used for communication among computer and different information technological devices close to one person. Some examples of devices that are used in a PAN are personal computers, printers, fax machines, telephones, PDAs, scanners, and even video game consoles. A PAN may include wired and wireless devices. The reach of a PAN typically extends to 10 meters. A wired PAN is usually constructed with USB and Firewire connections while technologies such as Bluetooth and infrared communication typically form a wireless PAN.

Wide area network

A wide area network (WAN) is a computer network that covers a large geographic area such as a city, country, or spans even intercontinental distances, using a communications channel that combines many types of media such as telephone lines, cables, and air waves. A WAN often uses transmission facilities provided by common carriers, such as telephone companies.

Metropolitan area network

A Metropolitan area network is a large computer network that usually spans a city or a large campus.

Virtual private network

A virtual private network (VPN) is a computer network in which some of the links between nodes are carried by open connections or virtual circuits in some larger network (e.g., the Internet) instead of physical wires. The data link layer protocols of the virtual network are said to be tunneled through the larger network when this is the case. One common application is secure communications through the public Internet, but a VPN need not have explicit security features, such as authentication or content encryption. VPNs, for example, can be used to separate the traffic of different user communities over an underlying network with strong security features.

EXERCISES

1 Look at the sentences below and decide whether they are <u>True</u> or <u>False</u>. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. A computer network is a collection of computers and devices interconnected.

T / F 2. Antennas and towers are part of the network in wireless systems.

T / F 3. LAN is restricted by distance more than MAN.

T / F 4. A connection between networks is an intranet.

T / F 5. Another name that can be given to the internet is MAN.

T / F 6. WAN can connect all the areas around the globe together.

T / F 7. Telephone companies provide transmission facilities for WAN.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What does a computer network allow?

2. What does WAN connect?

3. What does VPN stand for?

4. What is personal area network?
5. What is a node?

6. What forms a wireless PAN?

3 Find a word from the text to fill the blanks to complete the sentences.

1. A computer network transmits any ..... of voice, video and data between users.

2. The internet connects a large number of ..... networks.

3. The network has a ..... topology rather than a bus topology.

4. Home, school, or office building are places found in a …….. area network.

5. A PAN can be consisted of wired and wireless …….

4 With the help of your teacher write <u>nouns</u> beginning with the letter 'c' in the first paragraph of the passage only. (7 words)

1.
2.
3.
4.
5.
6.
7.

5 How many adjectives are used in the last paragraph? With the help of your teacher write them down. Repeated adjectives should be counted once.

6 Use the words given to complete the following sentences.

stores * share * compiler * systems * track * interactive * backwards * alert

1- The available range of microcomputer …… is evolving more rapidly than microcomputers.

2- Primary memory is closely associated with the CPU because it ..... programs and data temporarily.

3- Information is stored on a ..... in magnetized spots called bits.

4- CRT terminals, due to their speed and quietness, are very useful ..... devices for use in different places.

5- If documentation isn't available, it is always possible to work ..... and make a flowchart from an application program.

6- A computer needs its own ..... for the various high-level languages if it is expected to accept programs written in those languages.

7- The computer operator should be mentally ..... to cope with a multiprogramming environment.

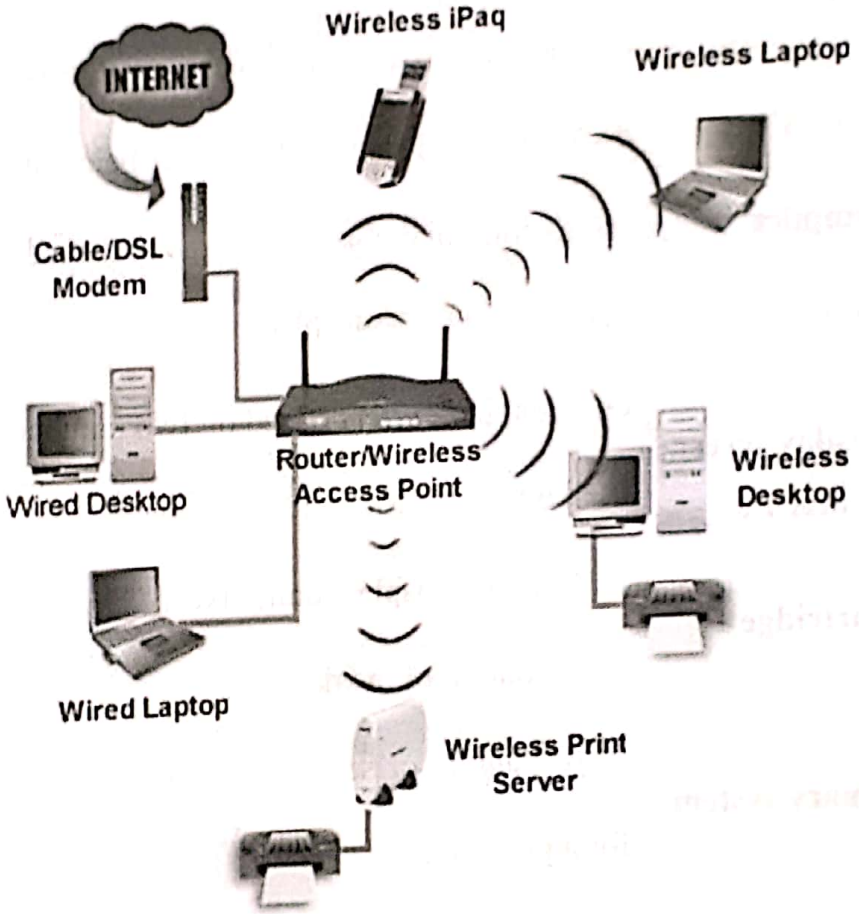
8- The members of an organization can all have computing power where they need it, on their desks, with the ability to ..... common databases.

7 Match the following words in column A with their definitions in column B.

A	B
..... 1- Artificial Intelligence	a- A small ferrite ring which is capable of being magnetized and demagnetized in the memory of a

	computer.
..... 2- Flowchart	b- A systems program which can be written in any language. It is applied to convert a source program into machine code.
..... 3- Core	c- Machine emulating human processes without explicit instructions i.e., the machine generates its own logic.
..... 4- Compiler	d- A circular disk called a platter being about the same size as a long-playing phonograph record, which can be magnetized on both sides.
..... 5- Display screen	e- A number system based on two numbers 0 or 1, which is used by digital computers.
..... 6- Cartridge	f- A visual display unit, like a TV screen, used for the visual output of the data.
..... 7- Binary system	g- A diagram or sequence of steps representing a solution for a problem.

Unit 11- Wireless Networks



Wireless Network

Wireless network refers to any type of computer network that is wireless, and is commonly associated with a telecommunications network whose interconnections between nodes are implemented without the use of wires. Wireless telecommunications networks are generally implemented with some type of remote information transmission system that uses electromagnetic

waves, such as radio waves, for the carrier and this implementation usually takes place at the physical level of the network.

Types of Wireless Networks

There are three primary usage scenarios for wireless connectivity:

- Wireless Personal Area Networking (WPAN)
- Wireless Local Area Networking (WLAN)
- Wireless Wide Area Networking (WWAN)

WPAN describes an application of wireless technology that is intended to address usage scenarios that are inherently personal in nature. The emphasis is on instant connectivity between devices that manage personal data or which facilitate data sharing between small groups of individuals.

WLAN on the other is more focused on organizational connectivity not unlike wire based LAN connections. The intent of WLAN technologies is to provide members of workgroups access to corporate network resources be it shared data, shared applications or e-mail but do so in way that does not inhibit a user's mobility.

Whereas WLAN addresses connectivity within a defined region, WWAN addresses the need to stay connected while traveling outside this boundary. Today, cellular technologies enable wireless computer connectivity either via a cable to a cellular telephone or through PC Card cellular modems.

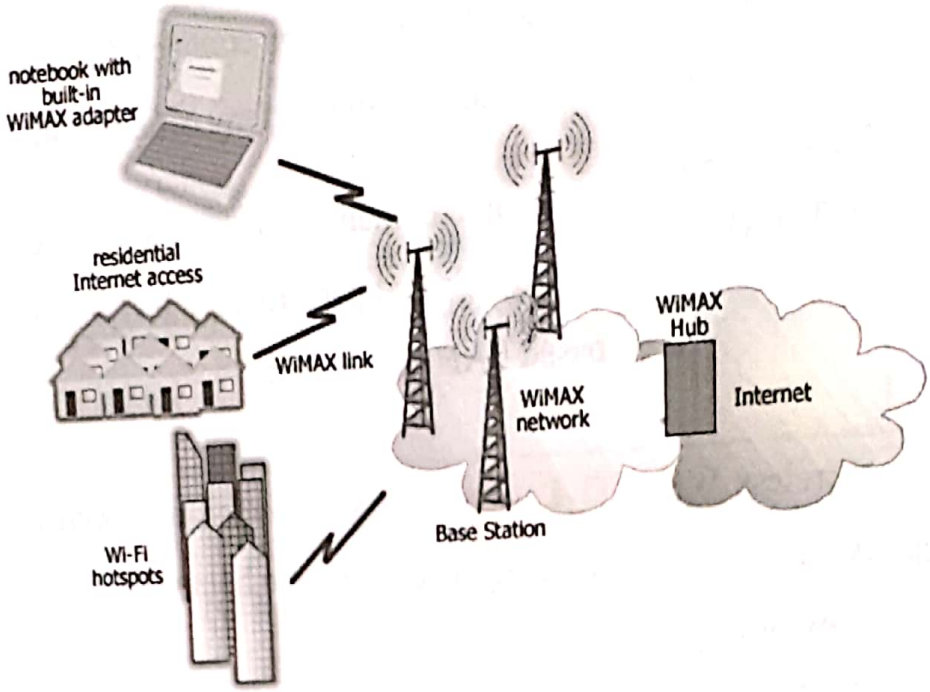
Wireless Usage Scenarios by Technology

Wireless Standard	Application Category	Usage Scenario
Bluetooth	Wireless Personal Area Networking (WPAN)	□ I want to instantly connect my notebook computer to another Bluetooth enabled notebook to transfer a file. □ I want to collaboratively work on a document where meeting participants use notebooks that are wirelessly connected via Bluetooth. □ Using a Bluetooth enabled, wireless headset, I want to listen to a CD playing on my notebook computer while it is in my briefcase. □ I often travel to a remote site and want to walk up to a shared printer, connect and print a document without having to physically connect using a standard printer cable. □ I want to connect to the Internet via a cellular phone without having to take my telephone out of my briefcase

802.11b	Wireless Local Area Networking (WLAN)	□ I want to always be connected to my corporate LAN while moving about in my office building or campus. □ Usage demands that I have access to corporate network data at performance levels equivalent to a wire based LAN connection.
Cellular Technologies (GSM)	Wireless Wide Area Networking (WWAN)	□ I want access to e-mail and web resources while traveling away from the home office.

WiMAX

WiMAX is designed to extend local Wi-Fi networks across greater distances such as a campus, as well as to provide last mile connectivity to an ISP or other carrier many miles away. In addition, Mobile WiMAX offers a voice and higher-speed data alternative to the cellular networks. Arguably the first 4G networking solution, mobile WiMAX offers greater bandwidth than previous technologies, an open ecosystem that promises compelling economics and a simplified, flatter architecture that reduces complexity and cost. Mobile WiMAX was designed for IP traffic from the beginning and has robust QoS support to handle real-time multimedia traffic such as video, gaming, and streaming music.



Bluetooth

Bluetooth is a simple type of the wireless networking that operates in the digital devices, like mobiles phones, personal computers, PDA, Laptops, digital camera, MP3 players and other Bluetooth enabled devices to form a small network. In the Bluetooth technology eight devices can be connected to each other at the same time. Bluetooth can also be found in the headsets, hands-free kits, wireless keyboards and mouse. Bluetooth technology was invented by Ericsson in 1994 and after four years in 1998 some major mobile phone companies such as Nokia, Ericsson, Intel and Toshiba formed a group to promote this technology.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. Wireless network is usually associated with wireless telecommunications between nodes.

T / F 2. Remote information transmission usually takes place at the physical level of the network.

T / F 3. WPAN is inherently impersonal in nature.

T / F 4. WWAN addresses the need to stay connected within a defined region.

T / F 5. Bluetooth operates in digital devices.

T / F 6. Only two devices can be connected together, at one time, in the Bluetooth technology.

T / F 7. At first, mobile WiMAX was made for IP traffic.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is the purpose of WLAN technologies?

2. What are some examples of digital devices?

3. What are the types of wireless networks?

4. What does WPAN describe?

5. Which major companies have used Bluetooth technology in their mobile phones?

6. What kind of ability have cellular technologies brought about?

3 Find a word from the text to fill the blanks to complete the sentences.

1. WN is mostly done with a kind of ..... information transmission system using electromagnetic waves.

2. When I want to listen to a CD playing on my notebook while it is in my briefcase and I use a wireless headset, the standard I use is .....

3. The application category I use while travelling overseas and wishing to have access to e-mail is ……. .

4. A simple kind of …….. networking is Bluetooth.

5. A voice and higher-speed data alternative are offered to the ……. Networks by mobile WiMAX.

4 Refer back to the text and try to find <u>synonyms</u> (words with similar meanings) for the following words.

1. kind:
2. generally :
3. major :
4. usage :
5. region :
6. laptop :
7. invent :

5 Use the words given to complete the following sentences.

<u>blocks * disks * personal * problems * steps * unit * documents * reliable</u>

1- The latest microcomputers, with laser printers, provide the chance to produce high-quality finished …… without needing

the services of an artist, and without much specialized training known as desk-top publishing.

2- The computer operator should be a ..... person because the job involves responsibility for very expensive machines.

3- Computers can deal with different kinds of ..... if they are given the right instructions for what to do.

4- Algorithm is a straightforward sequence of ..... of instructions which is used to solve problems.

5- Information on a disk is organized in terms of ....., each having its own address, which consists of a cylinder number, a track number, and a record number.

6- The hard disks, in turn, are subdivided into fixed-head and moving-head..... which are either cartridge or pack.

7- Programs and the data on which the control ..... and the ALU operate, must be in internal memory in order to be processed.

8- There is a rapidly growing market for ..... computers whose application potential in education is only just beginning to be exploited.

6 Match the following words in column A with their definitions in column B.

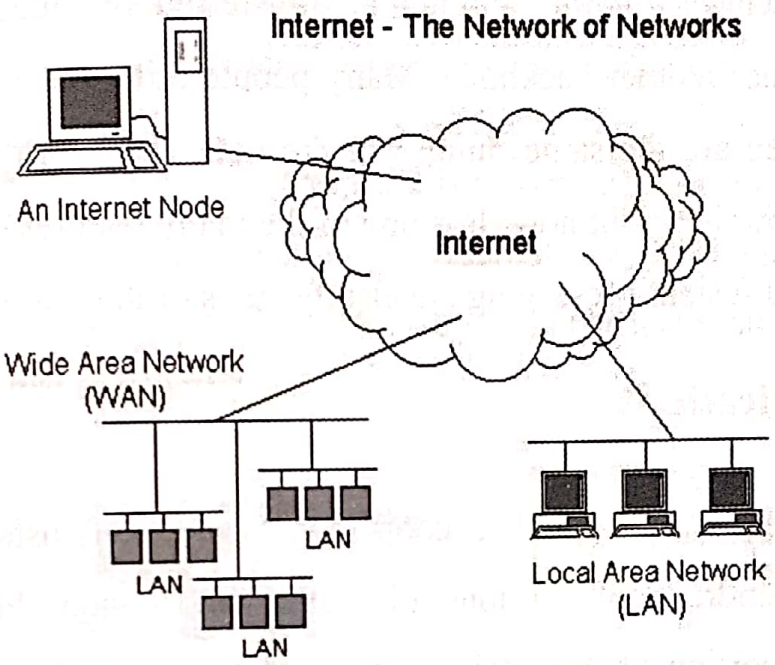
A	B
..... 1- Digital computer	a- A component of the control unit which takes the coded instruction and breaks it down into the individual commands necessary to carry it out.
..... 2- Dynamic graphics	b- A computer in which information is represented by one of two electronic states: on or off. They are represented by the two digits 1 and 0 respectively.
..... 3- Desktop publishing	c- A typewriter like a machine with a screen.
..... 4- Decoder	d- Graphics showing movement.
..... 5- Impact printer	e- Use of a microcomputer for all phases of document production.
..... 6- Console	f- A system providing a service when it is lost from another source.
..... 7- Backup system	g- A printer based on the method of striking characters through a carbon like a typewriter.

7 Translate into Persian

A *wireless ad hoc network* is a decentralized type of wireless network. The network is ad hoc because it does not rely on a preexisting infrastructure, such as routers in wired networks or access points in managed (infrastructure) wireless networks. Instead, each node participates in routing by forwarding data for other nodes, and so the determination of which nodes forward data is made dynamically based on the network connectivity.

In addition to the classic routing, ad hoc networks can use flooding for forwarding the data. The decentralized nature of wireless ad hoc networks makes them suitable for a variety of applications where central nodes can't be relied on, and may improve the scalability of wireless ad hoc networks compared to wireless managed networks.

Unit 12 – Internet



What is the Internet?

The Internet, sometimes called simply "the Net," is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). It was conceived by the Advanced Research Projects Agency (ARPA) of the U.S. government in 1969 and was first known as the ARPANet. The original aim was to create a network that would allow users of a research computer at one university to be able to "talk to" research computers at other universities. A side benefit of ARPANet's design was that, because messages could be routed or rerouted in more than one direction, the network could continue to function

even if parts of it were destroyed in the event of a military attack or other disaster.

Today, the Internet spreads across the globe and consists of countless networks and computers, allowing millions of people to share information. Data that travels long distances on the Internet is transferred on huge lines known collectively as the Internet backbone. Many people think the Internet and the World Wide Web are the same thing. They're not! The World Wide Web is what you are browsing right now. It is one of the many features of the Internet. E-mail, FTP, and Instant Messaging are also features of the Internet.

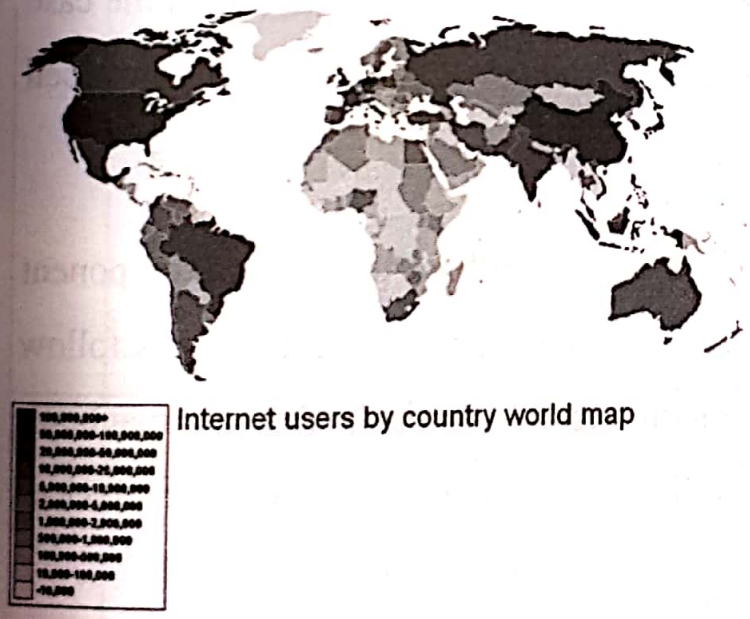
Internet Applications

Today, the Internet is a public, cooperative, and self-sustaining facility accessible to hundreds of millions of people worldwide. Physically, the Internet uses a portion of the total resources of the currently existing public telecommunication networks. Technically, what distinguishes the Internet is its use of a set of protocols called TCP/IP (for Transmission Control Protocol/Internet Protocol). Two recent adaptations of Internet technology, the *intranet* and the *extranet*, also make use of the TCP/IP protocol. For many Internet users, electronic mail (e-mail) has practically replaced the Postal Service for short written transactions. Electronic mail is the most widely used application on the Net. You can also carry on live "conversations" with other computer users, using Internet Relay Chat (IRC).

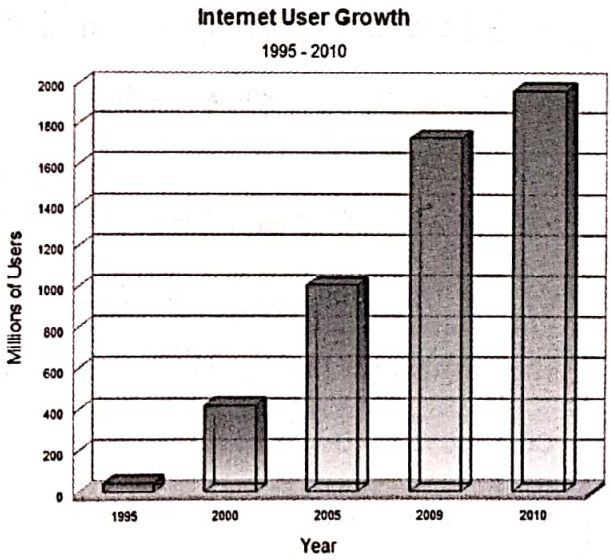
The most widely used part of the Internet is the World Wide Web (often abbreviated "WWW" or called "the Web"). Its outstanding feature is hypertext, a method of instant cross-referencing. In most Web sites, certain words or

phrases appear in text of a different color than the rest; often this text is also underlined. When you select one of these words or phrases, you will be transferred to the site or page that is relevant to this word or phrase. Sometimes there are buttons, images, or portions of images that are "clickable." If you move the pointer over a spot on a Web site and the pointer changes into a hand, this indicates that you can click and be transferred to another site.

Even though the Internet is still a young technology, it's hard to imagine life without it now. Every year, engineers create more devices to integrate with the Internet. This network of networks crisscrosses the globe and even extends into space. But what makes it work?



Internet users by country world map



Internet Components

To understand the Internet, it helps to look at it as a system with two main components. The first of those components is **hardware**. That includes everything from the cables that carry terabits of information every second to the computer sitting in front of you. Other types of hardware that support the

Internet includes routers, servers, cell phone towers, satellites, radios, smartphones and other devices. All these devices together create the network of networks. The Internet is a malleable system -- it changes in little ways as elements join and leave networks around the world. Some of these elements may stay fairly static and make up the backbone of the Internet. Others are more peripheral. These elements are connections. Some are end points -- the computer, smartphone or other device you're using to read this may count as one. We call those end points **clients**.

Machines that store the information we seek on the Internet are **servers**. Other elements are **nodes** which serve as a connecting point along a route of traffic. And then there are the transmission lines which can be physical, as in the case of cables and fiber optics, or they can be useless signals from satellites, cell phone or 4G towers, or radios.

All of this hardware wouldn't create a network without the second component of the Internet: the protocols. **Protocols** are sets of rules that machines follow to complete tasks. Without a common set of protocols that all machines connected to the Internet must follow, communication between devices couldn't happen.

The various machines would be unable to understand one another or even send information in a meaningful way. The protocols provide both the method and a common language for machines to use to transmit data.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. In Internet, users get information from other computers.

T / F 2. Arpanet's design had a side benefit for the US army when there was a destruction.

T / F 3. It is very easy to know exactly how many people around the world are sharing information.

T / F 4. The World Wide Web is the only feature of the Internet.

T / F 5. The Internet is accessible to everybody in the world.

T / F 6. The Postal Service has almost completely replaced electronic mail (e-mail).

T / F 7. WWW stands for World Wide Web.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is the short form of the Internet?

2. What other activity can users do other than sending and receiving information?

3. What is the Internet backbone?

4. Name some of the features of the Internet.

5. What are the two recent adaptations of Internet technology?

6. What are the two main components of the Internet?

3 Find a word from the text to fill the blanks to complete the sentences.

1. By using Internet Relay Chat, you can have ..... speaking with other users of computer.

2. Life is hard to be imagined without ..... .

3. End points are called ..... .

4. Communication between devices can happen when there is a common set of ..... followed by all machines connected to the Internet.

5. The Internet ..... transfers the data traveling long distances on the Net.

4 Refer back to the text and try to find <u>definitions</u> for the following terms.

1. the Internet :
2. the World Wide Web :
3. Hypertext :
4. Hardware
5. Servers :
6. Nodes :

5 Use the words given to complete the following sentences.

<u>combinations * executed* work * resources * equipment * determine * complicated * mounted</u>

1- A complete microcomputer system is composed of a microprocessor, a memory and peripheral .....

2- Most primary memory is costly, and therefore a program, or parts of it, is kept in internal storage while the program is being .....

3- To access information from a cartridge, it is ..... on a disk drive which is equipped with two recording heads, one for each side of the disk.

4- In a matrix printer, the characters are generated by selecting the appropriate ..... of pins in a rectangle.

5- A programmer must define a problem clearly to ..... how to solve the problem.

6- The means by which a computer knows which programs to ..... on is determined by its operating system.

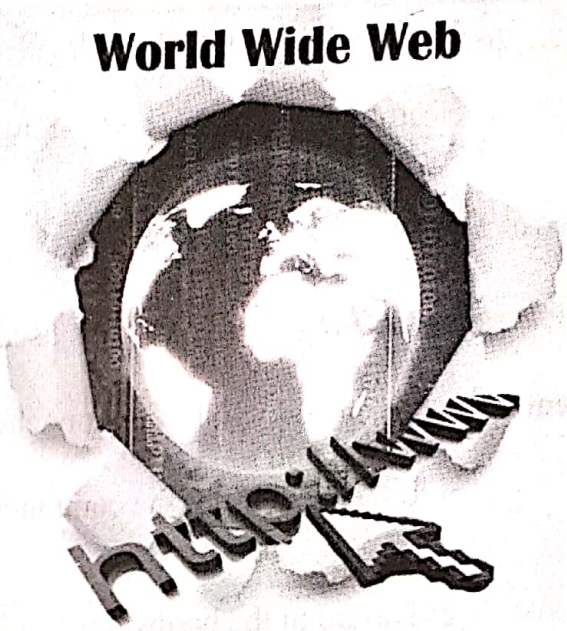
7- Many experimental computers can tackle problems as ..... as a game of chess, or recognizing an unfamiliar object from a description of it.

8- Several computers may share expensive ....., such as hard disks and printers, and they may also be connected via telecommunication links to other local networks.

6 Match the following words in column A with their definitions in column B.

A	B
..... 1- Laser writer	a- One of the components of the CPU, made up of electronic circuitry, performing the actual arithmetic and logical operations asked for by a program.
..... 2- Decimal system	b- An input device which is used to read the information represented by holes in a punched card so as to transmit it to the memory of the computer.
..... 3- Graphics	c- Failure of the hardware.
..... 4- Card reader	d- A number system based on 10 digits: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9.
..... 5- Interactive	e- Line drawings used to illustrate a point or tell a story.
..... 6- Computer breakdown	f- A non-impact printer in which the paper is charged electro statically and attracts dry ink powder to be baked on the paper.
..... 7- Arithmetic Logical Unit (ALU)	g- Being able to communicate with the computer on a question and answer basis.

Unit 13 – Web



World Wide Web

Leading information-exchange service of the Internet is the Web. It was created by Tim Berners-Lee and his colleagues at CERN and introduced to the world in 1991. A part of the Internet contains linked text, image, sound, and video documents. Before the World Wide Web (WWW), information retrieval on the Internet was text-based and required that users know basic UNIX commands. The World Wide Web has gained popularity largely because of its ease of use (point-and-click graphical interface) and multimedia capabilities, as well as its convenient access to other types of Internet services (such as e-mail, Telnet, and Usenet).

Improvements in networking technology, the falling cost of computer hardware and networking equipment, and increased bandwidth have helped the Web to

contain richer content. The Web is the fastest medium for transferring information and has universal reach (crossing geographical and time boundaries). It is also easy to access information from millions of Web sites using search engines (systems that collect and index Web pages, and store searchable lists of these pages). The Web's unified networking protocols make its use seamless, transparent, and portable. As the Web has evolved, it has incorporated complementary new technologies for developing online commerce and video on demand, to name a few.

Web Servers

The "Web" is made up of "Web servers," which are computers that store and disseminate "Web pages" to anyone with an Internet connection. Web pages are interactive documents that contain text, graphics, animations and videos. The pages often contain embedded programs that cause them to function in the same way as software that users install in their computers. As a result, the Web has enabled the concept of a "global server" that provides a source for all applications as well as data.

Hyperlinks and HTML

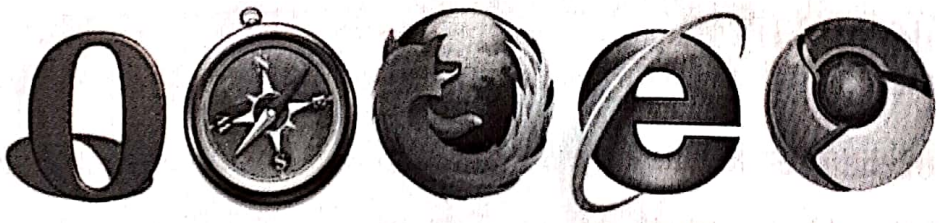
The heart of the Web technology is the hyperlink, which connects each page to each other by address, whether the document is on the same Web site or on a site half way around the world. In the mid-1990s, the novel concept of "click here" (click the hyperlink) caused the Web to explode.

Individual documents are called *Web pages*, and a collection of related documents is called a *Web site*. All Web documents are assigned a unique

Internet address called a Uniform Resource Locator (URL) by which they can be accessed by all Web browsers. A URL (such as http://www.hq.nasa.gov/office/procurement/index.html) identifies the communication protocol used by the site (http), its location [domain name or server (www.hq.nasa.gov)], the path to the server (office/procurement), and the type of document (html). The language used to create and link documents is called Hypertext Markup Language (HTML). Markup is the process of adding information to a document that is not part of the content but identifies the structure or elements. Markup languages are not new. HTML is based on the Standard Generalized Markup Language (SGML).

Web Browsers

Web pages are accessed by the user via a Web browser application such as Internet Explorer (IE), Firefox and Safari. The browser renders the pages on screen, executes embedded scripts and invokes additional software as needed. For example, Flash animations and video are rendered by Flash plug-in software that is tailored to each type of Web browser.



By 1994, there were approximately 500 Web sites, and, by the start of 1995, nearly 10,000. By the turn of the century, there were more than 30 million registered domain names. A decade later, more than a hundred million new domains were added. In 2010, Google claimed it found a trillion unique

addresses (URLs) on the Web as it maneuvered from Web site to Web site to populate its search engine. Accessing a Web document requires typing in the URL (Uniform Resource Locator) address of the home page in your Web browser. The home page contains links to other documents that can be stored on the same server or on a server anywhere in the world.

How to Write a Perfect Professional Email in English

Although emails are often seen as less formal than printed business letters, in the business world you cannot afford to let your language appear to be informal. Email may be faster and more efficient, but your client or business partner will not easily forgive correspondence that is too casual. Not to fear! Read on to discover simple secrets that will add a high level of professionalism to your English emails.

Begin with a greeting

It's important to always open your email with a greeting, such as "Dear Lillian", Depending on the formality of your relationship, you may want to use their family name as opposed to their given name, i.e. "Dear Mrs. Price,". If the relationship is more casual, you can simply say, "Hi Kelly," If you're contacting a company, not an individual, you may write "To Whom It May Concern:"

Thank the recipient

If you are replying to a client's inquiry, you should begin with a line of thanks. For example, if someone has a question about your company, you can say, "Thank you for contacting ABC Company." If someone has replied to one of your emails, be sure to say, "Thank you for your prompt reply." or "Thanks for getting back to me." If you can find any way to thank the reader, then do. It will put him or her at ease, and it will make you appear more courteous.

State your purpose

If, however, you are initiating the email communication, it may be impossible to include a line of thanks. Instead, begin by stating your purpose. For example, "I am writing to enquire about …" or "I am writing in reference to …" It's important to make your purpose clear early on in the email, and then move into the main text of your email. Remember to pay careful attention to grammar, spelling and punctuation, and to avoid run-on sentences by keeping your sentences short and clear.

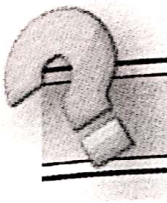
Closing remarks

Before you end your email, it's polite to thank your reader one more time as well as add some courteous closing remarks. You might start with "Thank you for your patience and cooperation." or "Thank you for your consideration." and then follow up with, "If you have any questions or concerns, don't hesitate to let me know." and "I look forward to hearing from you."

End with a closing

The last step is to include an appropriate closing with your name. "Best regards," "Sincerely," and "Thank you," are all professional. It's a good idea to

avoid closings such as "Best wishes," or "Cheers," as these are best used in casual, personal emails. Finally, before you hit the send button, review and spell check your email one more time to make sure it's truly perfect!



EXERCISES

1 Look at the sentences below and decide whether they are <u>True</u> or <u>False</u>. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. The Web Service was introduced to the world in 1991.

T / F 2. Search engines are being used to access information from various Web sites.

T / F 3. The Web has developed online commerce.

T / F 4. Web pages have text and graphics only.

T / F 5. The concept 'click here' made the Web explode.

T / F 6. Web site is the same as Web pages.

T / F 7. Users can access Web pages via Internet Explorer.

T / F 8. It is not good to be too casual with your client or business partner in email.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is the Web?

2. What are the reasons for the popularity of the World Wide Web?

3. What has aided the Web to contain richer content?

4. What are Web Servers?

5. What does URL identify?

6. What is Markup?

7. When should we thank our client?

3 Find a word from the text to fill the blanks to complete the sentences.

1. The fastest medium for transferring information is the .....

2. The interactive ..... are Web pages.

3. The Web, as a global ……., supplies data and a source for all applications.

4. Hyperlink connects …… to one another by address.

5. The …….. page can be stored on any server.

6. If you have any question, don't …….. to let me know.

4 One word in each set is lacking, find it from the passage and add it.

1. Sound, image, …….. and text

2. Transparent, …….. and portable

3. videos, ……., text and graphics

4. The type of document, ……., the communication protocol, and its location.

5 Use the words given to complete the following sentences.

storage * engaged * facilitate * commercial * commands * chain * extension * programmer* email * review

1- The long-term outcome of all the developments is that there will not be a need for specialized programmers, except for the comparatively small number..... on systems design.

2- Computer systems capable of time sharing programs..... real time programming.

3- Cobol is used for ..... purposes, dealing with problems that do not involve a lot of mathematical calculations.

4- It is necessary that a ..... is aware of what a program is supposed to do and what the machine is doing.

5- In train or ..... printers, if the hammer hits a little early or late, the character will appear slightly to the right or left of its proper position.

6- When disks are hooked up to the computer and used as an ..... of internal storage in order to increase the capacity of primary memory, called virtual storage.

7- The basic components of a computer system operate only in response to ..... from the control unit.

8- The internal memory or main ....., control and processing components make up the computer system.

9- The last step we take before we push the send button is to ..... and spell check our email.

6 Match the following words in column A with their definitions in column B.

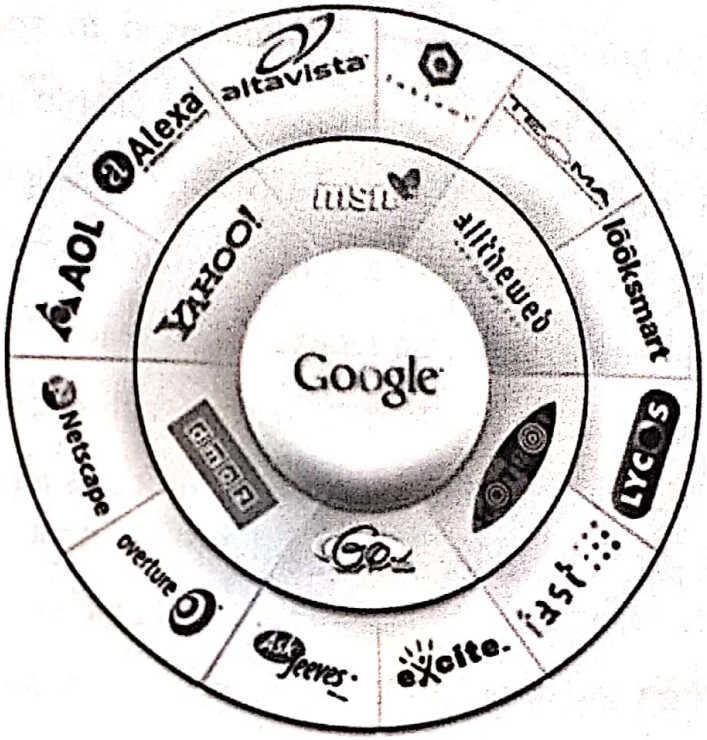
A	B
..... 1- Priority	a- The hole or socket in control panel.
..... 2- Random access	b- A device like a typewriter with keys representing different characters.
..... 3- Plotter	c- An impact printer using pins to print a pattern of dots on paper.
..... 4- Matrix printer	d- A pen-like device used for drawing graphs on paper for visual display of information.
..... 5- Microcomputer	e- A system used in multiprogramming to determine the sequence in which programs are to be processed.
..... 6- Hub	f- It is the time when any part of the memory may be read or accessed equally quickly.
..... 7- Keyboard	g- It is based on an integrated circuit

..... 8- recipient	h- A person who receives something for example a letter, a parcel, or an email.

7 Translate into Persian

Some Internet experts believe the next generation of the Web "*Web 3.0*" will make tasks like your search for movies and food faster and easier. Instead of multiple searches, you might type a complex sentence or two in your Web 3.0 browser, and the Web will do the rest. In our example, you could type "I want to see a funny movie and then eat at a good Mexican restaurant. What are my options?" The Web 3.0 browser will analyze your response, search the Internet for all possible answers, and then organize the results for you. That's not all. Many of these experts believe that the Web 3.0 browser will act like a personal assistant. As you search the Web, the browser learns what you are interested in. The more you use the Web, the more your browser learns about you and the less specific you'll need to be with your questions. Eventually you might be able to ask your browser open questions like "where should I go for lunch?" Your browser would consult its records of what you like and dislike, take into account your current location and then suggest a list of restaurants.

Unit 14 – Search Engines



Why do We Need Search Engines?

The good news about the Internet and its most visible component, the World Wide Web, is that there are hundreds of millions of pages available, waiting to present information on an amazing variety of topics. The bad news about the Internet is that there are hundreds of millions of pages available, most of them titled according to the whim of their author, almost all of them sitting on servers with cryptic names. When you need to know about a particular subject, how do you know which pages to read? If you're like most people, you visit an Internet search engine. A web search engine is designed to search for information on the World Wide Web and FTP servers. The search results are

generally presented in a list of results and are often called hits. The information may consist of web pages, images, information and other types of files.

A program searches documents for specified keywords and returns a list of the documents where the keywords are found. Although search engine is really a general class of programs, the term is often used to specifically describe systems like Google, Alta Vista and Excite that enable users to search for documents on the World Wide Web and USENET newsgroups. Typically, a search engine works by sending out a spider to fetch as many documents as possible. Another program, called an indexer, then reads these documents and creates an index based on the words contained in each document. Each search engine uses a proprietary algorithm to create its indices such that, ideally, only meaningful results are returned for each query.

How Web Search Engines Work

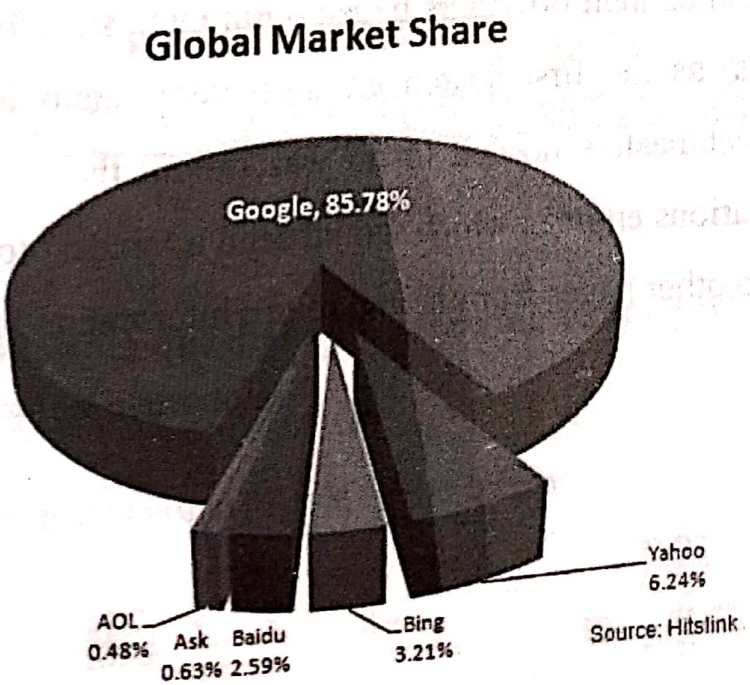
A search engine operates, in the following order:

1. web crawling
2. indexing
3. searching

Web search engines work by storing information about many web pages, which they retrieve from the html itself. These pages are retrieved by a Web crawler (sometimes also known as a spider) an automated Web browser which follows every link on the site. Exclusions can be made by the use of robots. The contents of each page are then analyzed to determine how it should be

indexed (for example, words are extracted from the titles, headings, or special fields called *Meta tags*). Data about web pages are stored in an index database for use in later queries. A query can be a single word. The purpose of an index is to allow information to be found as quickly as possible.

Some search engines, such as Google, store all or part of the source page (referred to as a cache) as well as information about the web pages, whereas others, such as AltaVista, store every word of every page they find. This cached page always holds the actual search text since it is the one that was actually indexed, so it can be very useful when the content of the current page has been updated and the search terms are no longer in it. This problem might be considered to be a mild form of link rot, and Google's handling of it increases usability by satisfying user expectations that the search terms will be on the returned webpage. This satisfies the principle of least astonishment since the user normally expects the search terms to be on the returned pages. Increased search relevance makes these cached pages very useful, even beyond the fact that they may contain data that may no longer be available elsewhere.



Search Engine Optimization

Search engine optimization (SEO) is the process of improving the visibility of a website or a web page in search engines via the "natural" or un-paid ("organic" or "algorithmic") search results. Other forms of search engine marketing (SEM) target paid listings. In general, the earlier (or higher on the page), and more frequently a site appears in the search results list, the more visitors it will receive from the search engine. SEO may target different kinds of search, including image search, local search, video search and industry-specific vertical search engines. This gives a website web presence.

As an Internet marketing strategy, SEO considers how search engines work and what people search for. Optimizing a website may involve editing its content and HTML and associated coding to both increase its relevance to specific keywords and to remove barriers to the indexing activities of search engines. Promoting a site to increase the number of backlinks, or inbound links, is another SEO tactic.

Webmasters and content providers began optimizing sites for search engines in the mid-1990s, as the first search engines were cataloging the early Web. Initially, all webmasters needed to do was submit the address of a page, or URL, to the various engines which would send a "spider" to "crawl" that page, extract links to other pages from it, and return information found on the page to be indexed.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. In order to know which pages to read we should use an internet search engine.

T / F 2. The search results are often called hits.

T / F 3. Google is an example of a search engine.

T / F 4. A search engine acts like a spider.

T / F 5. Cached pages contain data that is available everywhere.

T / F 6. Webmasters submit the address of a page to different engines.

T / F 7. All or part of the source page is stored in a cache.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. How many pages are available in the Internet?

2. Why is a web search engine designed?

3. Which systems help the users to search for documents?

4. What is the job of an indexer?

5. In what order does a search engine operate?

6. Where and why are data about web pages stored?

3 Find a word from the text to fill the blanks to complete the sentences.

1. Web pages are retrieved by a web ……

2. Robots are used to make ……

3. A (n) …… allows information to be found quickly.

4. Search engine optimization may …… different kinds of search.

5. Promoting a …… is another SEO tactic.

4 Here are some incomplete sentences; you can refer to the text to see what requires to be added to them so that they can be completed.

1. The good news about the Internet is .....

2. The bad news about the Internet is .....

3. The search results are presented in .....

4. The contents of each page are analyzed to .....

5 Use the words given to complete the following sentences.

desired * major * pictorial * stacked * perform * order * hammer * contents

1- The CPU determines which operations should be carried out and in what .....

2- The information present in a series of tiny compartments, storage locations, is called the ..... of the memory.

3- In drum printers, if the ..... hits a little early or late, the character will appear slightly above or below the line.

4- Flowcharting should be done for each ..... problem before the writing of a program is attempted.

5- Software packages are a set of programs designed to ..... certain applications which conform to internationally accepted rules.

6- A user can interact with the computer by asking it to perform a ..... task.

7- Multicolor ..... graphics are extremely useful in emphasizing contrast.

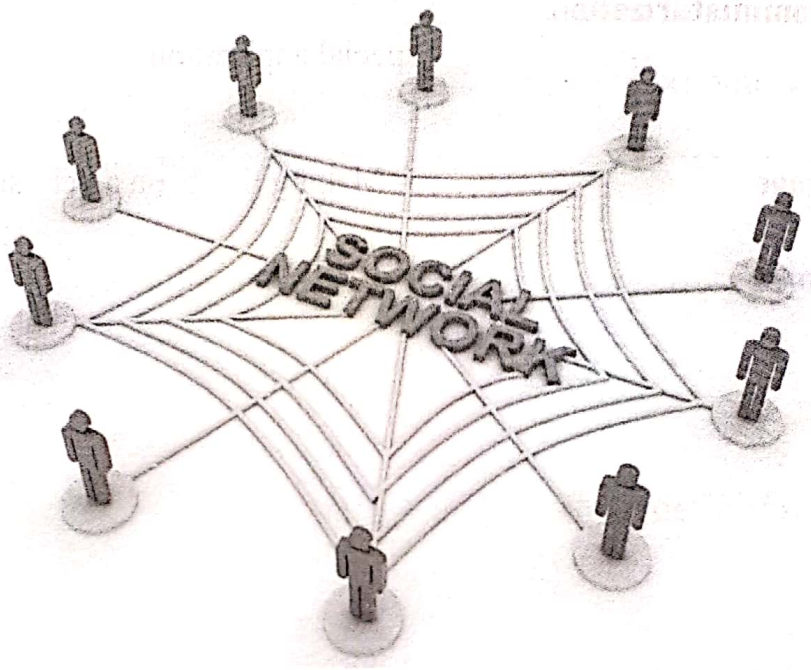
8- When a number of circular platters are ..... one on top of the other, they are called a disk pack

6 Match the following words in column A with their definitions in column B.

A	B
..... 1- Program documentation	a- It is the time when disks are hooked up to the computer and used as an extension of internal storage to increase the capacity of primary memory.
..... 2- Real time application	b- Allowing some users to share the sources of the computer concurrently.
..... 3- Time sharing	c- Applications which require real time processing.

..... 4- Virtual storage	d- Detailed instructions for the use and interpretation of a program.
..... 5- Microminiaturization	e- A generalized program written for a special application.
..... 6- Package	f- Making things on a very small scale.

Unit 15 – Social Networks



Introduction

A social network is a social structure made up of a set of social actors (such as individuals or organizations) and a set of the dyadic ties between these actors. The social network perspective provides a set of methods for analyzing the structure of whole social entities as well as a variety of theories explaining the patterns observed in these structures. The study of these structures uses social network analysis to identify local and global patterns, locate influential entities, and examine network dynamics.

Social networks and the analysis of them is an inherently interdisciplinary academic field which emerged from social psychology, sociology, statistics, and graph theory. Georg Simmel authored early structural theories in sociology emphasizing the dynamics of triads and "web of group affiliations." Jacob

Moreno is credited with developing the first *sociograms* in the 1930s to study interpersonal relationships. These approaches were mathematically formalized in the 1950s and theories and methods of social networks became pervasive in the social and behavioral sciences by the 1980s. Social network analysis is now one of the major paradigms in contemporary sociology, and is also employed in a number of other social and formal sciences. Together with other complex networks, it forms part of the nascent field of network science.

The social network is a theoretical construct useful in the social sciences to study relationships between individuals, groups, organizations, or even entire societies (social units, see differentiation). The term is used to describe a social structure determined by such interactions. The ties through which any given social unit connects represent the convergence of the various social contacts of that unit. This theoretical approach is, necessarily, relational. An axiom of the social network approach to understanding social interaction is that social phenomena should be primarily conceived and investigated through the properties of relations between and within units, instead of the properties of these units themselves. Thus, one common criticism of social network theory is that individual agency is often ignored although this may not be the case in practice (see agent-based modeling). Precisely because many different types of relations, singular or in combination, form these network configurations, network analytics are useful to a broad range of research enterprises. In social science, these fields of study include, but are not limited to anthropology, biology, communication studies, economics, geography, information science, organizational studies, social psychology, sociology, and sociolinguistics.

History

In the late 1890s, both Émile Durkheim and Ferdinand Tönnies foreshadowed the idea of social networks in their theories and research of social groups. Tönnies argued that social groups can exist as personal and direct social ties that either link individuals who share values and belief (Gemeinschaft, German, commonly translated as "community") or impersonal, formal, and instrumental social links (Gesellschaft, German, commonly translated as "society"). Durkheim gave a non-individualistic explanation of social facts, arguing that social phenomena arise when interacting individuals constitute a reality that can no longer be accounted for in terms of the properties of individual actors. Georg Simmel, writing at the turn of the twentieth century, pointed to the nature of networks and the effect of network size on interaction and examined the likelihood of interaction in loosely knit networks rather than groups.

Levels of analysis

In general, social networks are self-organizing, emergent, and complex, such that a globally coherent pattern appears from the local interaction of the elements that make up the system. These patterns become more apparent as network size increases. However, a global network analysis of, for example, all interpersonal relationships in the world is not feasible and is likely to contain so much information as to be uninformative. Practical limitations of computing power, ethics and participant recruitment and payment also limit the scope of a social network analysis. The nuances of a local system may be lost in a large network analysis, hence the quality of information may be more important than its scale for understanding network properties. Thus, social networks are

analyzed at the scale relevant to the researcher's theoretical question. Although levels of analysis are not necessarily mutually exclusive, there are three general levels into which networks may fall: micro-level, meso-level, and macro-level.

Top 6 Most Popular Social Networking Sites | October 2014

Here are the top 6 Most Popular Social Networking Sites as derived from our *eBizMBA Rank* which is a continually updated average of each website's *Alexa* Global Traffic Rank, and U.S.

facebook	Most of us already know that Facebook is the top social network on the web. It's a thriving beast of a social networking site on the web over a billion users. Despite holding the spot on the entire Internet for years now, it has to lead you to wonder just how long and what it might take for Facebook to eventually be brought down to a lower spot on the popular social site list. Time will only tell
	Like Facebook, Twitter has also changed dramatically over the years, becoming a top source for real-time news sharing. For a microblogging site with a 140-character text limit, Twitter sure has made its mark online. It's an ideal platform for mobile users, and Twitter Card integration make it easy to share all sorts of multimedia content in tweets.
Google+	Making its debut in the early summer of 2011, Google+ became the fastest growing social network the web has ever seen. After failing a couple times already with Google Buzz and Google Wave, the search giant finally succeeded at creating something that people are actually excited about using – especially alongside all the other popular Google apps and services.

	Where does everyone go to watch or share video content online? It's obviously YouTube. After Google, YouTube is the second largest search engine. Although owned by Google and now tied right into our Google+ accounts, YouTube can still be recognized as a separate social network all on its own as one that revolves entirely around content like video production, movie-making and music sharing
	Anyone who needs to make professional connections should be on LinkedIn. Known as the social network for your career, LinkedIn is right up there with Facebook, Twitter and Google+. Individuals can promote themselves and their businesses, outline their education and work experience, make connections with other professionals, interact in group discussions, post job ads or apply for jobs.
	Instagram has grown to be one of the most popular social networks for photo sharing that the mobile web has ever seen. It's the ultimate social network for sharing real-time photos and short videos while on the go. The app started by being exclusively limited to the iOS platform, but has since expanded to Android and, Windows Phone also the web. Instagram was bought for a hefty $1 billion in 2012.

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. A social network is a set of the dyadic ties between the actors.

T / F 2. The study of the structures uses social network analysis.

T / F 3. Social networks have emerged from social psychology, sociology, statistics, and graph theory.

T / F 4. Social network analysis is now one of the major paradigms in contemporary sociology.

T / F 5. Many different types of relations are useless to a broad range of research enterprises.

T / F 6. Social networks are self-organizing, emergent, and complex.

T / F 7. The nuances of a local system may not be lost in a large network analysis

T / F 8. There are three general levels into which networks may fall.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is a social network?

2. What has Jacob Moreno done?

3. Nowadays, where is social network analysis employed?

4. What forms part of the nascent field of network science?

5. Can you name one common criticism of social network theory?

6. Is there anything which is more important for understanding network properties?

3 Use the words given to complete the following sentences.

sharing * content * patterns * personal * scale * properties * networking

1. Social networks are analyzed at the ..... relevant to the researcher's theoretical question.

2. Facebook is a thriving beast of a social ..... site on the web over a billions users.

3. Twitter Card integration make it easy to share all sorts of multimedia ..... in tweets.
4. Instagram is the ultimate social network for ..... real-time photos and short videos while on the go.
5. Tönnies argued that social groups can exist as ..... and direct social ties that either link individuals or impersonal, formal, and instrumental social links.
6. Social phenomena should be primarily conceived and investigated through the ..... of relations between and within units, instead of the properties of these units themselves.
7. Social network analysis is used to identify local and global ....., locate influential entities, and examine network dynamics.

4 Refer back to the text and try to find synonyms (words with similar meanings) or antonyms (words with opposite meanings) for the following words.

1. practical:
2. method:
3. exactly:
4. personal:
5. informative:

6. shared with others:

7. position:

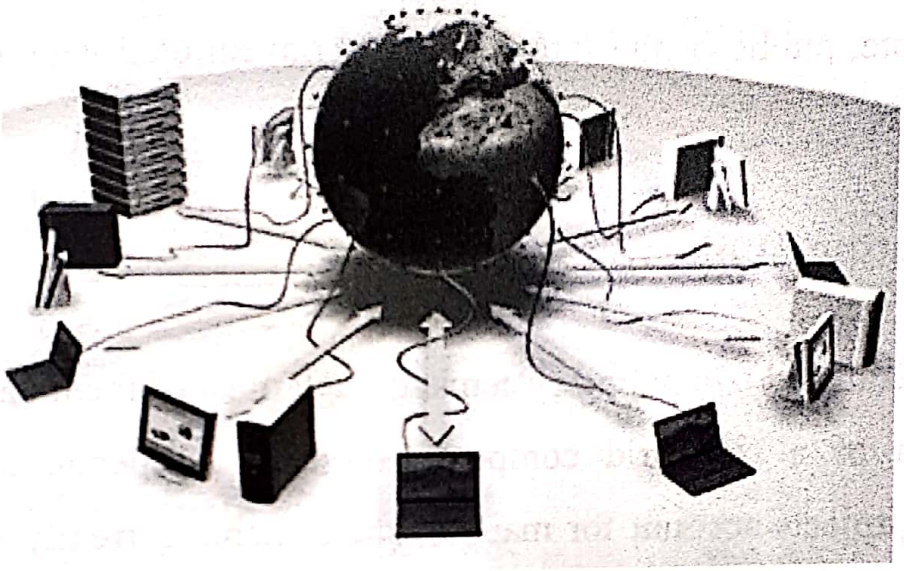
8. amateurs:

9. ask for:

5 Match the following words in column A with the words in column B to make compound words.

A	B
Social…….	relationships
interpersonal…….	ties
network …….	field
global…….	entities
dyadic…….	network
influential…….	patterns
academic…….	sociology
contemporary…….	approach

Unit 16 – Grid & Cloud Computing



Grid Computing

Grid computing is a term referring to the combination of computer resources from multiple administrative domains to reach a common goal. The Grid can be thought of as a distributed system with non-interactive workloads that involve a large number of files. What distinguishes grid computing from conventional high performance computing systems such as cluster computing is that grids tend to be more loosely coupled, heterogeneous, and geographically dispersed. Although a grid can be dedicated to a specialized application, it is more common that a single grid will be used for a variety of different purposes. Grids are often constructed with the aid of general-purpose grid software libraries known as middleware.

Grid size can vary by a considerable amount. Grids are a form of distributed computing whereby a "super virtual computer" is composed of many networked loosely coupled computers acting together to perform very large tasks. Furthermore, "Distributed" or "grid" computing in general is a special type of parallel computing that relies on complete computers (with onboard CPUs, storage, power supplies, network interfaces, etc.) connected to a network (private, public or the Internet) by a conventional network interface, such as Ethernet.

Grid Computing Applications

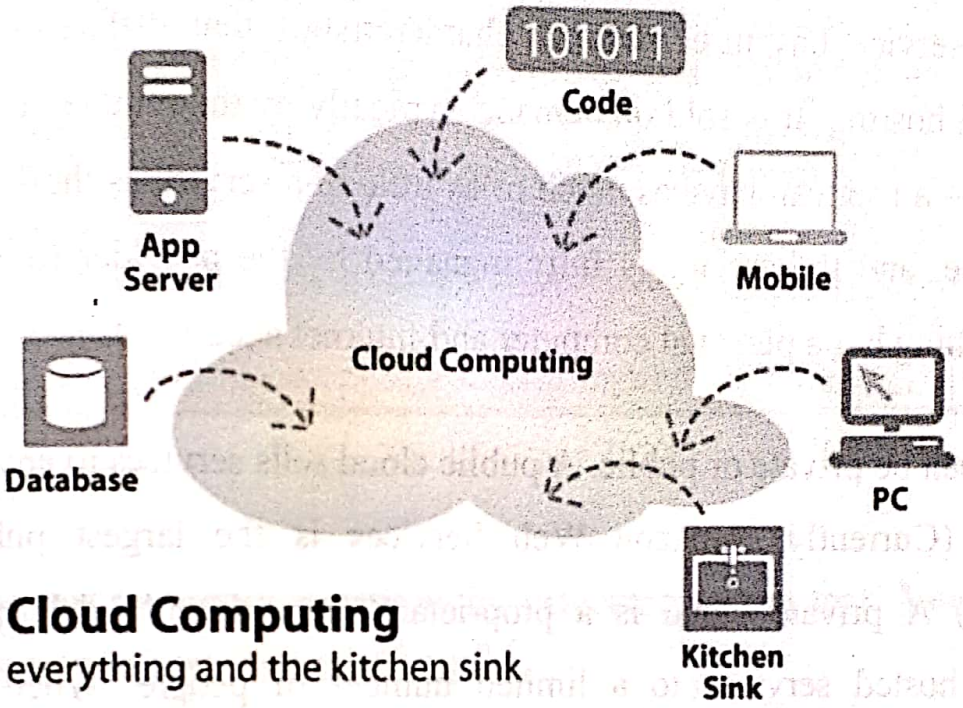
There are several grid computing systems, though most of them only fit part of the definition of a true grid computing system. Academic and research organization projects account for many of the systems currently in operation. These systems take advantage of unused computer processing power. The most accurate term for such a network is a shared computing system.

The Search for Extraterrestrial Intelligence (SETI) project is one of the earliest grid computing systems to gain popular attention. The mission of the SETI project is to analyze data gathered by radio telescopes in search of evidence for intelligent alien communications. There's far too much information for a single computer to analyze effectively. The SETI project created a program called SETI@home, which networks computers together to form a virtual supercomputer instead.

Protein to Protein, The Genome Comparison Project, a research project comparing the protein sequences of more than 3,500 organisms against each other, began on Dec. 20, 2006. By July 21, 2007, the project achieved all its

goals by using a grid computing system.

Cloud Computing



Cloud computing is Internet-based computing, whereby shared servers provide resources, software, and data to computers and other devices on demand, as with the electricity grid. Cloud computing is a natural evolution of the widespread adoption of virtualization, service-oriented architecture and utility computing. Details are abstracted from consumers, who no longer have need for expertise in, or control over, the technology infrastructure "in the cloud" that supports them.

Cloud computing describes a new supplement, consumption, and delivery model for IT services based on the Internet, and it typically involves over-the-Internet provision of dynamically scalable and often virtualized resources. It is a byproduct and consequence of the ease-of-access to remote computing sites

provided by the Internet. This frequently takes the form of web-based tools or applications that users can access and use through a web browser as if it was a program installed locally on their own computer.

A cloud service has three distinct characteristics that differentiate it from traditional hosting. It is sold on demand, typically by the minute or the hour; it is elastic -- a user can have as much or as little of a service as they want at any given time; and the service is fully managed by the provider (the consumer needs nothing but a personal computer and Internet access).

A cloud can be private or public. A public cloud sells services to anyone on the Internet. (Currently, Amazon Web Services is the largest public cloud provider.) A private cloud is a proprietary network or a data center that supplies hosted services to a limited number of people. When a service provider uses public cloud resources to create their private cloud, the result is called a virtual private cloud. Private or public, the goal of cloud computing is to provide easy, scalable access to computing resources and IT services.

EXERCISES

1 Look at the sentences below and decide whether they are <u>True</u> or <u>False</u>. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. A single grid can be used for only one purpose.

T / F 2. General-purpose grid software libraries are called middleware.

T / F 3. Grid size can be different.

T / F 4. A grid computing system cannot be used to achieve our goals.

T / F 5. Cloud computing has no relation with Internet.

T / F 6. Cloud computing is a byproduct of the ease-of-access to remote computing sites in Internet.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is Ethernet?

2. Are grids a form of distributed computing?

3. What is the mission of SETI project?

4. Which program comes to help a computer with far too much information?

5. What is the difference between a public cloud and a private one?

6. What is the goal of cloud computing, in general?

3 Find a word from the text to fill the blanks to complete the sentences.

1. The grid is a distributed ..... which has non-interactive workloads involving many files.

2. Distributed or grid is a particular kind of ..... computing relying on complete computers.
3. A grid computing system can help researchers to do their big ..... and achieve their goals.

4. By cloud computing shared ..... provide resources, software and data to computers and other devices.

5. Cloud computing involves provision of ..... scalable resources over-the-Internet.

4 Refer to the text and complete the features of each of the terms.

Grid computing is:

1. a combination .....

2. a distributed .....

3. more loosely .....

4. used for .....

5. a special .....

Cloud computing is:

1. internet .....

2. a natural .....

3. a description of a new .....

4. a byproduct .....

5. sold on .....

6. private .....

5 Use the words given to complete the following sentences.

developments * logical * routines * comparing * binary * data * bits * applications

1- A manager should have the ability to comprehend technical writings related to the field so as to advise his or her superiors of the most recent ..... in data processing.

2- A linkage editor is a systems program which fetches required systems ..... and links them to the object module.

3- Data base management is structuring and organizing the ..... in order to make them useful and available to more than one special user.

4- Information is stored on a tape in magnetized units called ..... which are similar to the bits in internal memory.

5- The arithmetic logical unit also performs some kinds of logical operations such as ..... or selecting information.

6- In digital computers the CPU can be divided into two functional units called the control unit and the arithmetic..... unit.

7- Microcomputer software is developing rapidly and it now covers a tremendous range of .....

8- Instead of programming computers in complex ..... codes, programming languages have become closer to normal business or scientific language.

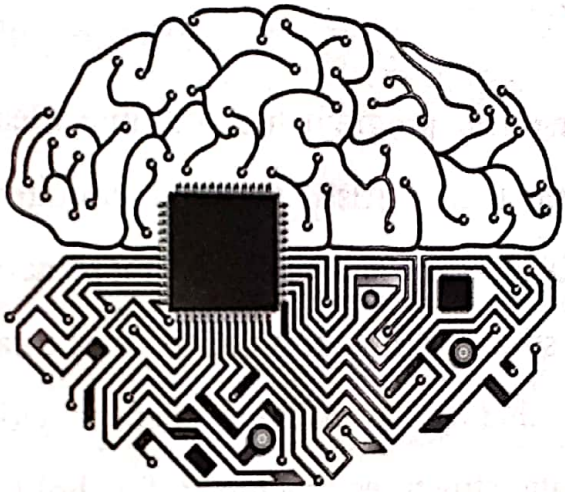
6 Match the following words in column A with their definitions in column B.

A	B
..... 1- Drum	a- Tables showing exponent of the power to which a fixed number must be raised to produce a given number.
..... 2- Block	b- A non-impact printer which operates by projecting small ink droplets and deflecting them electro statically.
..... 3- Contents	c- A high-level programming language used for mathematical and scientific problems.
..... 4- Logarithmic tables	d- An impact printer having a spinning cylinder for each character position in a line.
..... 5- Fortran	e- The information or data kept at a particular storage location in memory.
..... 6- Ink jet printer	f- A physical group of data records being on a tape or a disk.

7 Translate into Persian

There are dozens of active grid computing projects. Many of these projects aren't persistent, which means that once the respective project's goals are met, the system will dissolve. In some cases, a new, related project could take the place of the completed one. As grid computing systems' sophistication increases, we'll see more organizations and corporations create versatile networks. There may even come a day when corporations internetwork with other companies. In that environment, computational problems that seem impossible now may be reduced to a project that lasts a few hours. We'll have to wait and see.

Unit 17 - Artificial Intelligence



Artificial Intelligence

Artificial intelligence (AI) is the intelligence of machines and the branch of computer science that aims to create it. AI textbooks define the field as "the study and design of intelligent agents" where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success. John McCarthy, who coined the term in 1956, defines it as "the science and engineering of making intelligent machines. The *Turing test* is a test of a machine's ability to demonstrate intelligence. A human judge engages in a natural language conversation with one human and one machine, each of which tries to appear human. All participants are separated from one another. If the judge cannot reliably tell the machine from the human, the machine is said to have passed the test.

The foundations of artificial intelligence are divided into representation, problem-solving methods, architecture, and knowledge. To work on a task, a computer must have an internal representation in its memory, for example, the symbolic description of a room for a moving robot, or a set of features describing a person with a disease.

An Intelligent Agent

An intelligent agent person or program has multiple means for representing tasks and dealing with them. Also required architecture or operating framework within which to select and carry out these activities. Often called the executive or control structure, it is best viewed as a total architecture (as in computer architecture), that is, a machine that provides data structures, operations on those data structures, memory for holding data structures, accessing operations for retrieving data structures from memory, a programming language for expressing integrated patterns of conditional operations, and an interpreter for carrying out programs. Any digital computer provides architecture, as does any programming language. Architectures are not all equivalent, and one important scientific question is what architecture is appropriate for a general intelligent agent.

In artificial intelligence, the basic paradigm of intelligent action is that of search through a space of partial solutions (called the problem space) for a goal situation. Each step offers several possibilities, leading to a cascading of possibilities that can be represented as a branching tree.

An intelligent agent will have immense amounts of knowledge. This implies another major problem that of discovering the relevant knowledge as the

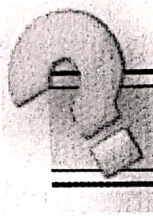
solution attempt progresses. Although this search does not include the combinatorial explosion characteristic of searching the problem space, it can be time consuming and hard. However, the structure of the database holding the knowledge (called the knowledge base) can be carefully tailored to suit the architecture in order to make the search efficient. This knowledge base, with its accompanying problems of encoding and access, constitutes the final ingredient of an intelligent system.

Expert Systems

A class of artificial intelligence programs called *expert systems* attempt to accomplish tasks by acquiring and incorporating the same knowledge that human experts have. Many attempts to apply artificial intelligence to medicine, government, and other socially significant tasks take the form of expert systems. Computer companies use expert systems to assist in configuring components from a parts catalog into a complete system that matches a customer's specifications, a kind of application that has been replicated in other industries tailoring assembled products to customers' needs. Troubleshooting and diagnostic programs are commonplace.

In addition to the subject areas mentioned above, significant work in artificial intelligence has been done on puzzles and reasoning tasks, induction and concept identification, symbolic mathematics, theorem proving in formal logic, natural language understanding and generation, vision, robotics, chemistry, biology, engineering analysis, computer-assisted instruction, and computer-program synthesis and verification, to name only the most prominent. As computers become smaller and less expensive, more and more intelligence is

built into automobiles, appliances, and other machines, as well as computer software, in everyday use.



EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. Intelligent agent is a system that takes actions to lower chances of success.

T / F 2. The machine can pass the test if the judge can't tell the machine from the human.

T / F 3. A computer can work on a task without any descriptions.

T / F 4. Architecture is provided by not only any digital computer but also any programming language.

T / F 5. A space of partial solutions is also called the problem space.

T / F 6. The final ingredient of an intelligent system is the knowledge base.

T / F 7. The smaller the computers, the more the intelligence.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is artificial intelligence?

2. What is McCarthy's definition of intelligent agent?

3. What are the foundations of artificial intelligence?

4. Are all architectures equivalent or not?

5. How do AI programs try to do tasks?

6. Where are expert systems applied?

3 Find a word from the text to fill the blanks to complete the sentences.

1. Textbooks define ..... as 'the study & design of intelligent agents'.

2. In order to show how ..... a machine is The Turing test is used.

3. The basic paradigm of intelligent action, in AI, is ..... via the problem space.

4. Troubleshooting and diagnostic programs are very usual for ..... systems.

4 Use the words given to complete the following sentences.

micros * user * manufacturer * columns * science * irrelevant * printing * converted

1- The kinds of problems that are tackled depend on whether the programmer is working for a computer manufacturer or .....

2- Printers differ in speed, size, and cost, and are designed to meet ..... requirements.

3- Random access devices bypass large quantities of..... data and therefore reduce access time considerably.

4- It is common practice in computer ..... for the words 'computer' and 'processor' to be used interchangeably.

5- Some modern ..... are destined for many new uses from more complex calculators to automobile engine operation and medical diagnostics.

6- The program produced after the source program has been ..... into machine code is referred to as an object program or object module.

7- A graph is better than ..... and pages of printed numbers, and has the advantages of being quicker to produce and easier to understand and file.

8- Systems programs are usually provided by the ..... of the machine.

5 Match the following words in column A with their definitions in column B.

A	B
..... 1- Electrostatic plotter	a- A systems program being an intermediary between the machine and the commercial programs.
..... 2- Hardware	b- Interpreting a source program or a list of instructions into machine language.
..... 3- Platter	c- A device electronically generating patterns of dots in a line across a page to make up a picture.

……. 4- Schema	d- The physical, electronic and electromechanical devices constituting the computer.
……. 5- Compile	e- A circular disk which can be magnetized on both sides.
……. 6- Assembler	f- The complete description of the logical structure of the data.

Unit 18 - Virtual Reality

What is Virtual Reality?

Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment. Virtual reality combines state-of-the-art imaging with computer technology to allow users to experience a simulated environment as reality. Several different technologies are integrated into a virtual reality system, including holography, which uses lasers to create three-dimensional images; liquid crystal displays; high-definition television; and multimedia techniques that combine various types of displays in a single computer terminal.

Virtual Reality also refers to computer-generated, three-dimensional simulations that allow a participant to experience and interact with a setting or situation. In the most intense forms of virtual reality, a participant wears a headset that incorporates high-resolution video displays and audio speakers, immersing the participant in a computer-generated experience. The participant also wears a special glove or body suit studded with sensors that monitor all movement. Data from the participant's movements are then fed into a computer, which modifies the simulation accordingly. Virtual reality systems allow a participant to experience, navigate through, and manipulate a hypothetical area filled with imaginary structures and objects. This area is often referred to as "cyberspace," a term first used by author William Gibson in his 1984 novel, Neuromancer. By the end of the twentieth century, virtual reality not only encapsulated a specific technology, but also signaled a broader set of cultural questions about the place of technology in modern life.

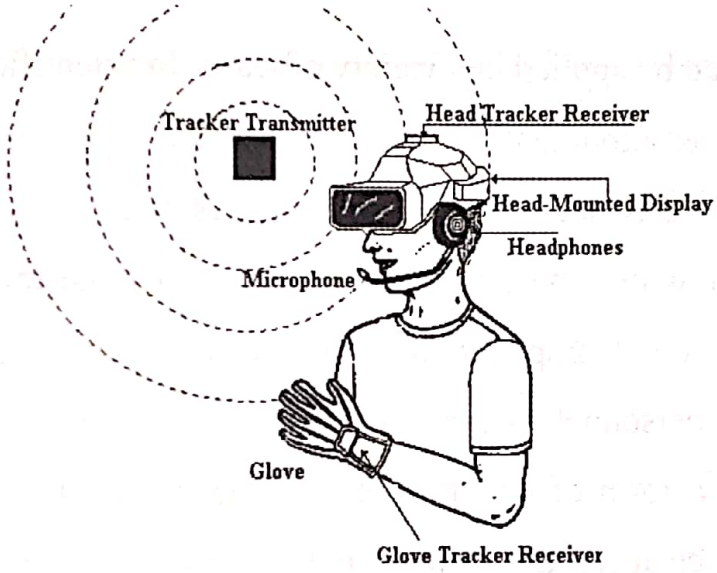
Virtual reality can be divided into:

- The simulation of a real environment for training and education.
- The development of an imagined environment for a game or interactive story.

Virtual Reality Modeling Language

The Virtual Reality Modeling Language (VRML) allows the creator to specify images and the rules for their display and interaction using textual language statements.

Another word the VR is use of computer modeling and simulation to enable a person to interact with an artificial three-dimensional visual or other sensory environment. A computer-generated environment simulates reality by means of interactive devices that send and receive information and are worn as goggles, headsets, gloves, or body suits. The illusion of being in the created environment is accomplished by motion sensors that pick up the user's movements and adjust his or her view accordingly, usually in real time.



Virtual Reality Devices

Virtual reality relies on a variety of specialized input and output devices to achieve this sense of natural interaction. The most important of the input devices used in a virtual environment, a tracker is capable of reporting its location in space and its orientation. Tracking devices can be optical, magnetic, or acoustic. A tracker is sometimes combined with a traditional computer input device, such as a mouse or a joystick.

An attempt to provide a truly natural input device, the data glove is outfitted with sensors that can read the angle of each of the finger joints in the hand.

Wearing such a glove, users can interact with the virtual world through hand gestures, such as pointing or making a fist. The real-world visual experience is approximated in virtual environments by using stereoscopic displays. Two views of the simulated world are generated, one for each eye, and a stereoscopic display device is used to show the correct view to each eye.

Applications

Virtual reality can be applied in a variety of ways. In scientific and engineering research, virtual environments are used to visually explore whatever physical world phenomenon is under study. Training personnel for work in dangerous environments or with expensive equipment is best done through simulation. Airplane pilots, for example, train in flight simulators. Virtual reality can enable medical personnel to practice new surgical procedures on simulated individuals. As a form of entertainment, virtual reality is a highly engaging way to experience imaginary worlds and to play games. Virtual reality also provides a way to experiment with prototype designs for new products.In some virtual worlds no interaction is allowed apart from a person's movement (the world is visualized but little else). In more complex worlds each object can have its own behavior. Thus, doors may be opened, a phone can be used to have a conversation with another person, or a virtual computer can be used to send real electronic mail. Virtual worlds that contain complex object behaviors are time-consuming to develop but are becoming more commonplace. Of course, there is nothing to stop a virtual world redefining the laws of physical reality so that objects can, for instance, 'fall' upwards when they are dropped!

EXERCISES

1 Look at the sentences below and decide whether they are True or False. You should refer to the text for getting the required information and if the sentences are false make the necessary changes in order that the false sentences become true.

T / F 1. We use software to create virtual reality.

T / F 2. The movements a participant makes are entered into a computer as data.

T / F 3. Virtual reality is not useful in education.

T / F 4. Interactive devices are very important in the VR.

T / F 5. The VR only uses input devices for a natural interaction.

T / F 6. The data glove is an output device.

T / F 7. Virtual reality can enable medical personnel to train in flight simulators.

2 Answer the following questions by referring to the text. Your answers should be in complete sentences.

1. What is virtual reality?

2. Is the environment simulated by computer technology real or artificial?

3. What technologies are included in a virtual reality system?

4. Give examples of input devices used in the VR?

5. Does virtual reality have limited uses?

6. When is it time-consuming in Virtual worlds?

3 Find a word from the text to fill the blanks to complete the sentences.

1. In ..... virtual worlds, every object has its own behavior in movements.

2. Working in dangerous environments, practicing new surgical procedures, experiencing imaginary worlds & playing games are ..... in which virtual reality can be applied.

3. Hand gestures are used for having interaction with the virtual world, while users wear the ..... glove.

4. Training & education, and games or interactive stories are the ..... into which VR can be divided.

5. 'Neuromancer' is the move where the word '……' was used for the first time.

4 Let's write some features of VR.

It is ……

1. an artificial …….. .
2. created with …….. .
3. accepted as a …… environment.
4. a three- …….. simulation.

5 Return to the text and try to find some more environments where VR is used:

1. ……

2. ……

3. ……

6 Use the words given to complete the following sentences.

trainings * condense * principle * condition * tedious * advancement * originality * distinguish

1- Dust and dirt cause the recording ..... of disks to deteriorate.

2- A knowledgeable programmer can ..... between COBOL and Basic statements.

3- A programmer can operate a computer if he has the proper .....

4- Although a computer can replace people in dull, routine tasks, it has no .....

5- Being fast, microfilm can also ..... large stacks of paper down into small amounts.

6- Since binary system is very ..... for human beings, it can increase the possibility of committing errors.

7- The computer transmits information through the ..... of connected or broken electrical circuits.

8- Man's creativity together with the ..... in chip technology has caused today's microcomputers to be almost as powerful as yesterday's minis.

7 Match the following words in column A with their definitions in column B.

A	B
..... 1- Single purpose	a- A non-impact printer using a particular chemically treated paper on which the characters are exposed by such means as a laser.
..... 2- Sequential device	b- A sheet of plastic with all of the flowcharting symbols cut into it.
..... 3- Template	c- Being used for only one purpose.
..... 4- Real time processing	d- Organized groups of data.
..... 5- Thermal printer	e- A device permitting information to be written onto or read off some storage medium in a fixed sequence.
..... 6- Sets of data	f- It is processing data after they are generated and using them go update the relevant files.

8 Translate into Persian

Users travel within a simulated world by moving toward where they want to be, and interact with things in that world by grasping and manipulating simulated objects. In the most successful virtual environments, users feel that they are truly present in the simulated world and that their experience in the virtual world matches what they would experience in the environment being simulated. This sensation is referred to as engagement, immersion, or presence, and it is this quality that distinguishes virtual reality from other forms of human-computer interaction.

Abbreviations

AGP: Accelerated Graphics Port.

API: Application Programming Interface.

ASCII: American Standard Code for Information Interchange.

BIOS: Basic Input / Output System.

DBMS: Database Management System

GSM: Global System for Mobile Communications.

GUI: Graphical User Interface

HTML: Hypertext Markup Language.

IDE: Integrated Drive Electronics.

IEEE: Institute of Electrical Electronic Engineers.

IP: Internet Protocol

IRC: Internet Relay Chat.

ISP: Internet Service Provider.

IT: Information Technology.

LAN: Local Area Network.

MAN: Metropolitan Area Network.

PCL: Process Control Language.

PDA: Personal Digital Assistant.

QoS: Quality of Service.

ROM: Read Only Memory.

SATA: Serial Advanced Technology Attachment.

SEM: Search Engine Marketing

SEO: Search Engine Optimization

SGML: Standard Generalized Markup Language.

SQL: Structured Query Language.

URL: Uniform Resource Locater.

USB: Universal Serial Bus.

VRML: Virtual Reality Modeling Language.

WAN: Wide Area Network.

WI-FI: Wireless Fidelity.

WiMAX: Worldwide Interoperability for Microwave Access.

XML: Extensible Markup Language.

Glossary – Unit Based

Unit 1

absence	نبود، فقدان
accomplish	انجام دادن، کامل کردن
antonym	متضاد
arithmetic	ریاضی ، محاسبات
binary system	سیستم دودوئی
calculating	محاسبه کردن
calculator	ماشین حساب
capable	قادر، توانا
categorize	طبقه بندی کردن
central	مرکزی
circuit	مدار
combination	ترکیب
complexity	پیچیدگی
component	جزء سازنده، قطعه
computer	ماشین الکترونیکی، کامپیوتر ، رایانه
concurrently	همروند، یکجا
conduit	مسیر، مجرا
consecutive	متوالی
continuously	بطور مداوم، مستمر
correspond	مطابق بودن
decodes	کد برداری، رمز گشایی
develop	توسعه دادن، گسترش یافتن
device	وسیله، ابزار، دستگاه
discrete	گسسته، جدا
distinction	تمایز، تفاوت
distinguished	متمایز ، متفاوت
engineering	مهندسی
especially	مخصوصا
evaluation	ارزیابی کردن
execute	اجرا کردن
grid computing	محاسبات گرید
hardware	سخت افزار
incorporating	بهم پیوستن ، متشکل از
instruction	دستور
interior	درونی، داخلی
intermediate	طبقه میانی
linking	بهم پیوستن، متصل کردن

situation	وضعیت
solution	راه حل
sophisticated	در سطح بالا ، پیچیده
synchronized	همگام شده، هماهنگ
synonym	هم خانواده، هم معنی، مترادف
temporarily	بطور موقت
terminal	ترمینال، پایانه
utilize	مورد استفاده قرار دادن
varying	مختلف
workstation	ایستگاه کاری

Unit 2

access	دستیابی، دسترسی
attached	ضمیمه، متصل
board	صفحه مدار
brain	مغز
bridge	پل
bus	گذرگاه
chassis	شاسی
communication	ارتباطات
concept	مفهوم
logical operations	محاسبات / عملیات منطقی
mainframe	کامپیوترهای بزرگ که همزمان به چندین کاربر سرویس می دهند
mass	تعداد زیاد، توده
minicomputer	کامپیوتر کوچک
multiuser	چند کاربره
network	شبکه
operations	عملیات ، محاسبات
oscillator	نوسانگر
parallel-processing	پردازش موازی
pattern	الگو
performing	اجرا کردن
permanently	بطور همیشگی، دائما
process	پردازش، فرآیند
quantity	کمیت
registers	ثبات های پردازنده
relationship	ارتباط، رابطه
retain	نگه داشتن
serving	سرویس دادن
simulation	شبیه سازی

random	تصادفی
rectangular	مستطیلی
removable	قابل انتقال/ حذف
resident	مستقر
screen	صفحه
software	نرم افزار
substance	جسم، ماده
untouchable	غیر قابل لمس

Unit 3

anti-static	ضد الکتریسیته ساکن
appropriate	مناسب
audio	شنیداری، صوتی
connector	متصل کننده، رابط
discharge	دشارژ، خالی کردن
firmly	بطور محکم
gently	با ملایمت، به آرامی
host	میزبان
interface	واسط، رابط
jumper	وصل کننده، اتصال ساز
lever	دسته، اهرم
connect	اتصال دادن، وصل کردن
desired	مطلوب
disc	دیسک، صفحه
display	نمایش دادن
drive	گرداننده
expansion	گسترش
firmware	میان افزار، نرم افزار دائمی
heat sink	فروبرنده حرارت
integrated	جامع، مجتمع
media	رسانه ها، وسیله ها
mediate	وساطت کردن
memory	حافظه
motherboard	برد اصلی
multitude	گروه بسیار، کثیر
object	شی
operating system	سیستم عامل
optical	نوری
peripherals	دستگاهای جانبی
pointing	اشاره گر
port	پورت، درگاه

describe	شرح دادن، توصیف کردن
detach	جدا کردن
disaster	فاجعه
disconnect	منفصل کردن، قطع کردن
dismount	پیاده کردن
enterprise	گسترده
expensive	گران، پرخرج
extraordinarily	بطورفوق العاده
format	قالب بندی کردن
indirectly	بطور غیرمستقیم
information	اطلاعات
interaction	تعامل
jukebox	گرامافون
magnetic tape	نوار مغناطیسی
magnitude	مقدار، اندازه
measure	اندازه گیری کردن
medium	رسانه، وسیله
metadata	اطلاعات درباره داده ها، فرا داده
mount	سوار کردن
non-volatile	غیر فرار
offline	آفلاین، برون خطی
necessary	لازم، ضروری
pin	پین، گیره
quite	کاملا
screw	پیچ
secure	محکم کردن، ایمن کردن
settings	تنظیمات
simple	ساده، آسان
slot	شیار
strap	بند، نوار
strip	تهی کردن خالی کردن
towards	بسوی، بطرف
unpacking	باز کردن، گشودن
wrist	مچ دست

Unit 4

abstraction	تجرید، انتزاع
accessible	قابل دسترسی
auxiliary	کمکی
bootstrap	خودراه انداز
consequently	در نتیجه
demand	درخواست، نیاز

application	کاربردی
built-in	توکار، غیرقابل انتقال
capability	توانایی، ظرفیت
carry out	انجام دادن
conduct	هدایت / اداره کردن
configuration	پیکربندی
consist	شامل شدن
consistent	ثابت
console	کنسول
coordination	هماهنگی
details	جزئیات
efficient	موثر، کارا
elaborate	ماهر، استاد
enforce	مجبور کردن
environment	محیط
finite	محدود
function	عملکرد
generally	به طور کلی، عموما
hand-held	قابل حمل، دستی
handle	اداره کردن
initiate	راه انداختن
invoke	احضار کردن
predominant	غالب، عمده
primary storage	حافظه اولیه، حافظه اصلی
provide	فراهم کردن
punched cards	کارت های پانچ شده
purpose	منظور
recovery	بازیافت
remote	از راه دور
retrieve	بازیابی کردن
secondary storage	حافظه ثانویه / فرعی
source	منبع، مبدا
swap	عوض کردن، جانشین کردن
tertiary	سومین، قسمت سوم
transfer	انتقال دادن
unaffected	بی تاثیر
via	بوسیله، از طریق

Unit 5

access	دسترسی داشتن
accountant	حسابدار
allocate	تخصیص دادن

various	مختلف، گوناگون
web server	سرویس دهنده / سرور وب

Unit 6

alliance	پیوستگی، اتحاد
assistance	دستیاری، کمک
burden	بار مسئولیت
collaboratively	به طور مشترک / جمعی
competitor	رقیب
contemporary	معاصر
copy left	قانون مقابل کپی رایت
core	هسته
decade	دهه
deflect	منحرف کردن
development	توسعه، پیشرفت
dismissed	به حساب نیاوردن، منفصل کردن
distribution	توزیع
economy	اقتصاد
ecosystem	اکوسیستم

management	مدیریت
multi-tasking	چند وظیفه ای
password	کلمه عبور
permit	اجازه دادن
policy	سیاست، روش
protection	حفاظت، محافظت
recognize	تشخیص دادن
regardless of	صرف نظر از
relatively	نسبتا
relieve	رها کردن، آسوده کردن
request	درخواست کردن
resource	منبع
responsible	مسئول
routine	روتین، امر عادی
scheme	برنامه، نقشه
security	امنیت
share	به اشتراک گذاشتن
simultaneously	همزمان
time slicing	تقسیم بندی زمانی
unauthorized	غیرمجاز
underlying	درزیرقرارگرفته
upgrade	پیشرفت کردن، ارتقا دادن

pundit	دانشمند
purchase	خریداری کردن
reciprocity	عمل متقابل
release	رها کردن
research	تحقیق
smart phones	گوشیهای هوشمند
solely	به تنهایی
spreading	گسترش
stack	پشته
tablet	تبلت
task	وظیفه، کار
throughout	سراسر، درطول
unaware	بی اطلاع
unheralded	پیش بینی نشده
vendor	فروشنده
virus	ویروس

Unit 7

abstract	چکیده
accredited	معتبر
advertisements	تبلیغات، اگهی
effort	تلاش
evolved	نمو کردن، ظاهر شدن
fundamentals	اصول
individual	شخص، فرد
industry	صنعت
innovation	اختراع، نوآوری
kernel	شالوده، هسته اصلی
knowledge	دانش
licenses	گواهی نامه
live	زنده
middleware	میان افزار
mission-critical	فاکتور اصلی و اساسی
net books	لپ تاپ های بسیار کوچک با حافظه کم
ongoing	مداوم
open source	متن باز
originally	در ابتدا
participate	شرکت کردن
partition	قسمت بندی کردن
potential	عامل بالقوه
primary	عمده، اصلی
principle	اصول و قاعده

algorithm	الگوریتم
analyst	تحلیل گر
approach	راهکار، رهیافت
approximate	تقریبی
assembly language	زبان اسمبلی
boundary	مرز
broadly	وسیع، پهناور
certain	معین، خاص
certification	گواهینامه
coding	برنامه نویسی، کدگذاری
commercial	تجاری
compatible	سازگار
compiler	کامپایلر
consequence	دست آورد، نتیجه
craft	حرفه
critical	حساس و مهم
debate	مباحثه
debugging	اشکال زدایی
discipline	نظم
distinct	مشخص، مجزا
embedded	جاسازی شده
engineering	مهندسی
estimate	تخمین زدن
evolvable	قابل تغییر / تکمیل
exhibit	ارائه دادن، نشان دادن
expertise	تخصص، مهارت
fault	اشتباه، نقص
formal logic	منطق صوری
governmentally	از طرف دولت
high-level language	زبان سطح بالا
illegal	غیر قانونی
inexpensive	ارزان
institution	موسسه
interpretation	تفسیر
interpreter	مفسر، مترجم
invent	اختراع کردن
just-in-time	درست بموقع
low-level	سطح پایین
maintaining	نگه داری کردن
measured	شمرده / اندازه گیری شده
mental	ذهنی
particular	مخصوص
phase	مرحله
preference	مزیت

adaptation	تطبیق، مطابقت
affordable	ارزان، قابل تهیه
complex	پیچیده
concerned	مربوط
conform	وفق دادن، مطابقت کردن
conquer	غلبه کردن، حل کردن
correction	تصحیح، اصلاح
crisis	بحران
divide	تقسیم کردن
frequently	به دفعات، مکرر
integrate	جمع / ادغام کردن
life-critical	حیاتی
life-cycle	چرخه حیات
manufacture	بعمل آوردن، ساختن
modify	تغییر دادن، اصلاح کردن
notation	نشان گذاری، یادداشت برداری
origin	منبع، مبدا
proliferate	زیاد شدن
provoke	برانگیختن، تحریک کردن
re-engineering	مهندسی مجدد
static	ایستا، بدون تغییر
profession	حرفه، شغل
programming	برنامه نویسی
prone	متمایل، مستعد
punched card	کارت پانچ
regulated	کنترل شده
script	اسکریپت
self-governed	خود مختار، مستقل
significant	قابل توجه، مهم
source code	کد مبدا
specialized	تخصصی
spectrum	طیف
strict	سختگیر
subject	موضوع
suitability	مناسب بودن، در خور بودن
transform	تبدیل کردن، تغییر شکل دادن
troubleshooting	اشکال زدایی، عیب یابی

Unit 8

acceptance	قبولی

systematic	نظام مند
tracking	پیگردی، رد گیری
version	نگارش، نسخه
waterfall	آبشاری

Unit 9

albeit	اگرچه
analyze	تجزیه و تحلیل کردن
architecture	معماری
benefit	سود
bibliographic	مربوط به فهرست کتاب، کتابنامه ای
classify	طبقه بندی / دسته بندی کردن
coherent	منسجم
conceptual	مفهومی
conveniently	براحتی
crawler	خزنده
database	پایگاه داده
demographic	وابسته به آمارگیری نفوس، جمعیتی
distributed	توزیع شده
download	دانلود کردن
end-user	کاربر نهایی
enterprise	گسترده و در سطح سازمانی
equivalent	برابر، مساوی
essentially	در اصل، اساسا
external	خارجی
facility	امکان، وسیله
financial	مالی
hypermedia	ابر رسانه
indirection	غیر مستقیم، بدون جهت
internal	داخلی
inventory	فهرست وار، فهرست
load	بارگزاری کردن
operational	عملیاتی
organized	سازمان یافته
promotion	ارتقا، توسعه، پیشروی
query	پرس و جو
reclassify	باز طبقه بندی کردن
relational	رابطه ای
retrieve	بازیابی کردن

fire wire	ارتباط سیمی کارا
global	جهانی
interconnected	بهم متصل شدن
local	محلی
mesh	توری
metropolitan	وابسته به پایتخت، کلانشهری
private	شخصی، خصوصی
ring	حلقه ای
router	مسیریاب، راهبر
scope	محدوده، میدان
secure	امن
server	سرویس دهنده
share	به اشتراک گذاردن
star	ستاره ای
switch	سوئیچ، کلید
topology	توپولوژی، جا نمایی
tower	برج
traffic	ترافیک، عبور و مرور
virtual	مجازی
visual	بصری
wide	وسیع

statistical	اماری
subscription	اشتراک
trade-off	ایجاد تعادل، مبادله
transaction	تراکنش، تغییر
uncomplicated	ساده، روشن
undergo	متحمل شدن
warehouse	انبار، مخزن

Unit 10

authentication	اهراز هویت ، تصدیق
bridge	پل
bus	گذرگاه
characteristics	خصوصیت، ویژیگیها
classify	طبقه بندی کردن
client	کلاینت، سرویس گیرنده
combination	ترکیب
connect	وصل / متصل کردن
disparate	مختلف، متفاوت
encryption	رمز کردن
facilitate	تسهیل کردن

wireless	بی سیم

Unit 11

access point	نقطه دستیابی
ad hoc	کاربرد موردی، موقتی
alternative	جایگزین، دیگر
arguably	قابل بحث، مستدل
associate	وابسته کردن، ارتباط دادن
bandwidth	پهنای باند
compelling	جالب توجه، در خور تحسین
complexity	پیچیدگی
decentralized	نامتمرکز، غیر متمرکز
electromagnetic	الکترو مغناطیسی
improve	پیشرفت دادن، بهبود بخشیدن
infrastructure	زیرساخت، زیربنا
multimedia	چند رسانه ای
participant	شریک
preexisting	از قبل وجود داشتن
real-time	زمان واقعی، بی درنگ
region	ناحیه
remote	از راه دور
robust	قابل اعتماد، اتکا پذیر ، قوی
streaming	جریانی، سیال
waves	امواج
wireless	تلگراف بی سیم

Unit 12

agency	نماینده
backbone	ستون فقرات
conceived	فهمیدن، درک کردن
conversation	گفتگو، مکالمه
cooperative	شراکتی
countless	بیشمار
cross-referencing	ارجاع به مستندی مربوط، ارجاع متقابل
disaster	فاجعه
distinguish	تمیز دادن، تشخیص دادن
extranet	شبکه خارجی،

business letter	نامه تجاری
casual	غیر رسمی
cheers	شاد، خوش باشید
client	مشتری، موکل
closing remarks	نظرات، اظهارات پایانی
concern	مربوط بودن
consideration	توجه، ملاحظه
contact	در تماس بودن
cooperation	همکاری
correspondence	مکاتبه، نامه نگاری
courteous	مودب، با ادب
convenient	راحت، مناسب
dislike	دوست نداشتن
disseminate	ارسال کردن، توضیع کردن
domain	دامنه، حوزه
email	نامه الکترونیکی
enquire	پرسش کردن
eventually	سرانجام، عاقبت
expert	کارشناس
explode	منفجرشدن
generation	نسل
internet	شبکه جهانی
intranet	شبکه داخلی، اینترانت
malleable	قابل انعطاف، سازگار
meaningful	پرمعنی، معنی دار
peripheral	جانبی
permission	مجوز، اجازه
portion	بخش، قسمت
protocol	پروتکل، قرار داد
public	عمومی
satellite	ماهواره
self-sustaining	متکی به خود
signal	سیگنال
worldwide	در سطح جهانی، جهانی

Unit 13

approximately	تقریبا
best wishes	با بهترین آرزوها
browser	مرورگر

uniform	یکسان
unique	منحصربفرد
unix	سیستم عامل یونیکس
web page	صفحه وب
web servers	سرویس دهنده وب
web site	وب سایت
world wide web	شبکه گسترده جهانی

Unit 14

astonishment	شگفتی
barrier	مانع، سد
beyond	دورتر، بیش از
catalog	فهرست کردن
fetch	واکشی
indexer	تولید کننده شاخص
keyword	کلمه کلیدی
natural	طبیعی
optimization	بهینه سازی
presence	حضور، وجود
proprietary	اختصاصی
geographical	جغرافیایی
greeting	سلام و احوالپرسی
hesitate	تامل کردن
hyperlink	ابر لینک
hypertext	ابر متن
in reference to	عطف به، بازگشت به
inquiry	پرسش
look forward to	چشم به راه بودن
maneuver	مانور دادن
online	آنلاین، برخط
patience	حوصله، صبر
plug-in	متصل شده در
portable	قابل حمل
professional	حرفه ای
punctuation	علامت گذاری
render	تحویل دادن، منتقل کردن
sentence	جمله
sincerely	صمیمانه، ارادتمند
spelling	املا
tailored	در خور، مناسب
transparent	شفاف

debut	پیش نمایی
derived from	مشتق شده از
dyadic	دوتایی
dynamics	پویایی
economics	اقتصاد
emergent	در شرف تکوین
enterprise	کار، فعالیت
entity	ماهیت، تمامیت
ethics	اخلاقیات
exclusive	انحصاری، اختصاصی
feasible	مناسب، ممکن
field	زمینه
foreshadow	از پیش خبر دادن
geography	جغرافیا
global	جهانی
graph	نمودار، منحنی
hefty	مبلغ هنگفت
ideal	ایده ال
influential	موثر
instrumental	مفید، موثر
integration	ادغام، ترکیب
relevance	رابطه
search engine	موتور جستجو
spider	عنکبوت
tag	برچسب، علامت
un-paid	پرداخت نشده
webmaster	مسئول توسعه و نگهداری سایت

Unit 15

affiliation	وابستگی، رابطه
alongside	همراه با
anthropology	مردم شناسی
axiom	اصل بدیهی
beast	چیز ناپسند
biology	زیست شناسی
coherent	منسجم
configuration	پیکربندی، نمایه
constitute	تشکیل دادن
contain	دارا بودن
continually	بطور پیوسته، همواره
convergence	همگرایی، تقارب

interaction	تعامل
interdisciplinary	میان رشته ای
interpersonal	میان فردی
knit	همبسته
likelihood	احتمال
macro	بزرگ
meso	متوسط
micro	کوچک
nascent	شکوفا، در حال تکوین
nuance	فحوا، ریزه کاری
on the go	خیلی گرفتار
outline	خلاصه کردن
paradigm	نمونه، الگو
pattern	الگو، طرح
perspective	چشم انداز
pervasive	فراگیر
property	ویژگی، مشخصه
psychology	روانشناسی
recruitment	تقویت، بکار گیری
revolve	گشتن، چرخیدن
scale	مقیاس، معیار
scope	گستره، محدوده
social actors	فعالان اجتماعی
social network	شبکه اجتماعی
sociogram	نگاشت اجتماعی
sociolinguistics	جامعه شناسی زبان
sociology	جامعه شناسی
spot	مکان، محل
statistics	آمار
structure	ساختار
term	واژه، اصطلاح
thriving	در حال شکوفایی / رشد
ties	روابط
triads	سه گانه
tweet	توئیت (لغت مربوط به توئیتر)
uninformative	نا آموزنده

Unit 16

accurate	صحیح، درست
administrative	اجرایی

provision	فراهم کردن / سازی
service-oriented	سرویس گرا
sophistication	کمال، دلفریبی، پیچیدگی
supplement	مکمل
tend	گرایش داشتن
traditional	سنتی
utility computing	محاسبات کاربردپذیر/کمکی
versatile	تطبیق پذیر، چند کاره
virtualization	مجازی سازی
whereby	که بموجب آن
widespread	همه جانبه
workload	حجم / بار کاری

Unit 17

accompanying	همراه
accomplish	انجام دادن، به انجام رساندن
acquiring	دسترسی یافتن، بدست آوردن
agent	عامل
adoption	پذیرش
alien	خارجی
byproduct	محصول ثانویه
cluster	کلاستر، خوشه
computing	محاسبات
considerable	قابل توجه
consumption	مصرف
dissolve	منحل کردن
dozen	۱۲ عدد، دوجین
elastic	قابل ارتجاع
ethernet	اترنت
evidence	مدرک، شاهد
evolution	سیر تکاملی
extraterrestrial	ماورای کره زمین
grid computing	محاسبات گرید
heterogeneous	ناهمگن، ناهمگون
hosting	میزبانی
intelligence	هوش
loosely coupled	پیوند ضعیف
non-interactive	غیر تعاملی
on demand	بنا به تقاضا و نیاز، در صورت نیاز

appliance	دستگاه، تجهیزات
artificial	مصنوعی
combinatorial	ترکیبی
commonplace	معمولی، پیش پا افتاده
constitute	تشکیل دادن
dealing with	مربوط بودن به، در ارتباط با
demonstrate	نمایش دادن، شرح دادن
encoding	کدگذاری
engages	درگیر شدن
expert system	سیستم خبره
express	بیان کردن
framework	چارچوب
immense	بی اندازه، فراوان
incorporating	یکی کردن، بهم پیوستن
ingredient	اجزا
judge	قاضی
paradigm	شیوه، روش
prominent	شاخص، برجسته
relevant	مربوط، وابسته
replicate	تکرار کردن
symbolic	نمادین
synthesis	استنتاج، ترکیب
verification	تایید، اثبات

Unit 18

accordingly	از اینرو، بر طبق آن
acoustic	صوتی
belief	باور
cultural	فرهنگی، تربیتی
cyberspace	فضای سایبر / مجازی
entertainment	سرگرمی
experience	تجربه کردن، تجربه
gestures	اشاره، حرکت
glove	دستکش
grasping	درک کردن، فهمیدن
holography	ایجاد تصویر لیزری / سه بعدی
hypothetical	فرضی
illusion	تصور
imaging	تصور کردن

immersing	غوطه ور کردن
incorporate	امیختن ، ترکیب کردن
intense	قوی
joystick	دسته فرمان
manipulate	دستکاری کردن
navigate	هدایت کردن
orientation	موقعیت، جهت
phenomenon	پدیده
pilot	پیلوت، خلبان
prototype	نمونه اولیه
reality	واقعیت، حقیقت
sensation	احساس، حس
simulated	شبیه سازی شده
stereoscopic	برجسته بینی
suspend	تعلیق دادن، به تعویق انداختن
three-dimensional	سه بعدی
tracker	دنبال کننده
truly	صادقانه، واقعا
variety	متنوع
wear	پوشیدن

Glossary-Alphabetic

absence	نبود، فقدان	adoption	پذیرش
abstract	چکیده	advertisements	تبلیغات، اگهی
abstraction	تجرید، انتزاع	affiliation	وابستگی، رابطه
acceptance	قبولی	affordable	ارزان، قابل تهیه
access	دستیابی، دسترسی	agency	نماینده
access point	نقطه دستیابی	agent	عامل
accessible	قابل دسترسی	albeit	اگرچه
accompanying	همراه	algorithm	الگوریتم
accomplish	انجام دادن، کامل کردن	alien	خارجی
accomplish	انجام دادن، به انجام رساندن	alliance	پیوستگی، اتحاد
accordingly	از اینرو، بر طبق آن	allocate	تخصیص دادن
accountant	حسابدار	alongside	همراه با
accredited	معتبر	alternative	جایگزین، دیگر
accurate	صحیح، درست	analyst	تحلیل گر
acoustic	صوتی	analyze	تجزیه و تحلیل کردن
acquiring	دسترسی یافتن، بدست آوردن	anthropology	مردم شناسی
ad hoc	کاربرد موردی، موقتی	anti-static	ضد الکتریسیته ساکن
adaptation	تطبیق، مطابقت	antonym	متضاد
administrative	اجرایی	appliance	دستگاه، تجهیزات

application	کاربردی	beast	چیز ناپسند
approach	راهکار، رهیافت	belief	باور
appropriate	مناسب	benefit	سود
approximate	تقریبی	best wishes	با بهترین آرزوها
approximately	تقریبا	beyond	دورتر، بیش از
architecture	معماری	bibliographic	مربوط به فهرست کتاب، کتابنامه ا
arguably	قابل بحث، مستدل	binary system	سیستم دودوئی
arithmetic	ریاضی ، محاسبات	biology	زیست شناسی
artificial	مصنوعی	board	صفحه مدار
assembly language	زبان اسمبلی	bootstrap	خودراه انداز
assistance	دستیاری، کمک	boundary	مرز
associate	وابسته کردن، ارتباط دادن	brain	مغز
astonishment	شگفتی	bridge	پل
attached	ضمیمه، متصل	bridge	پل
audio	شنیداری، صوتی	broadly	وسیع، پهناور
authentication	اهراز هویت ، تصدیق	browser	مرورگر
auxiliary	کمکی	built-in	توکار، غیرقابل انتقال
axiom	اصل بدیهی	burden	بار مسئولیت
backbone	ستون فقرات	bus	گذرگاه
bandwidth	پهنای باند	business letter	نامه تجاری
barrier	مانع، سد	byproduct	محصول ثانویه
		calculating	محاسبه کردن

calculator	ماشین حساب
capability	توانایی، ظرفیت
capable	قادر، توانا
carry out	انجام دادن
casual	غیر رسمی
catalog	فهرست کردن
categorize	طبقه بندی کردن
central	مرکزی
certain	معین، خاص
certification	گواهینامه
characteristics	خصوصیت، ویژگیها
chassis	شاسی
cheers	شاد، خوش باشید
circuit	مدار
classify	طبقه بندی کردن
client	کلاینت، سرویس گیرنده
client	مشتری، موکل
closing remarks	نظرات، اظهارات پایانی
cluster	کلاستر، خوشه
coding	برنامه نویسی، کدگذاری
coherent	منسجم

coherent	منسجم
collaboratively	به طور مشترک / جمعی
combination	ترکیب
combinatorial	ترکیبی
commercial	تجاری
commonplace	معمولی، پیش پا افتاده
communication	ارتباطات، ارتباطی
compatible	سازگار
compelling	جالب توجه، در خور تحسین
competitor	رقیب
compiler	کامپایلر
complex	پیچیده
complexity	پیچیدگی
complexity	پیچیدگی
component	جزء سازنده، قطعه
computer	ماشین الکترونیکی، کامپیوتر ،
computing	محاسبات
conceived	فهمیدن، درک کردن
concept	مفهوم
conceptual	مفهومی
concern	مربوط بودن

distribution	توزیع	end-user	کاربر نهایی
divide	تقسیم کردن	enforce	مجبور کردن
domain	دامنه، حوزه	engages	درگیر شدن
download	دانلود کردن	engineering	مهندسی
dozen	۱۲ عدد، دوجین	engineering	مهندسی
drive	گرداننده	enquire	پرسش کردن
dyadic	دوتایی	enterprise	گسترده
dynamics	پویایی	enterprise	گسترده و در سطح سازمانی
economics	اقتصاد	enterprise	کار، فعالیت
economy	اقتصاد	entertainment	سرگرمی
ecosystem	اکوسیستم	entity	ماهیت، تمامیت
efficient	موثر، کارا	environment	محیط
effort	تلاش	equivalent	برابر، مساوی
elaborate	ماهر، استاد	especially	مخصوصا
elastic	قابل ارتجاع	essentially	در اصل، اساسا
electromagnetic	الکترو مغناطیسی	estimate	تخمین زدن
email	نامه الکترونیکی	ethernet	اترنت
embedded	جاسازی شده	ethics	اخلاقیات
emergent	در شرف تکوین	evaluation	ارزیابی کردن
encoding	کدگذاری	eventually	سرانجام، عاقبت
encryption	رمز کردن، به رمز درآوردن	evidence	مدرک، شاهد

evolution	سیر تکاملی	feasible
evolvable	قابل تغییر / تکمیل	fetch
evolved	نمو کردن، ظاهر شدن	field
exclusive	انحصاری، اختصاصی	financial
execute	اجرا کردن	finite
exhibit	ارائه دادن، نشان دادن	fire wire
expansion	گسترش	firmly
expensive	گران، پرخرج	firmware
experience	تجربه کردن، تجربه	foreshadow
expert	کارشناس	formal logic
expert system	سیستم خبره	format
expertise	تخصص، مهارت	framework
explode	منفجرشدن	frequently
express	بیان کردن	function
external	خارجی	fundamentals
extranet	شبکه خارجی، اکسترانت	generally
extraordinarily	بطورفوق العاده	generation
extraterrestrial	ماورای کره زمین	gently
facilitate	تسهیل کردن	geographical
facility	امکان، وسیله	geography
fault	اشتباه، نقص	gestures

مناسب، ممکن

واکشی

زمینه

مالی

محدود

ارتباط سیمی کارا

بطور محکم

میان افزار، نرم افزار دائمی

از پیش خبر دادن

منطق صوری

قالب بندی کردن

چارچوب

به دفعات، مکرر

عملکرد

اصول

به طور کلی، عموما

نسل

با ملایمت، به آرامی

جغرافیایی

جغرافیا

اشاره، حرکت

global	جهانی	hypertext	ابر متن
glove	دستکش	hypothetical	فرضی
governmentally	از طرف دولت	ideal	ایده ال
graph	نمودار، منحنی	illegal	غیر قانونی
grasping	درک کردن، فهمیدن	illusion	تصور
greeting	سلام و احوالپرسی	imaging	تصور کردن
grid computing	محاسبات گرید	immense	بی اندازه، فراوان
hand-held	قابل حمل، دستی	immersing	غوطه ور کردن
handle	اداره کردن	improve	پیشرفت دادن، بهبود بخشیدن
hardware	سخت افزار	in reference to	عطف به، بازگشت به
heat sink	فروبرنده حرارت	incorporate	امیختن ، ترکیب کردن
hefty	مبلغ هنگفت	incorporating	یکی کردن، بهم پیوستن
hesitate	تامل کردن	indexer	تولید کننده شاخص
heterogeneous	ناهمگن، ناهمگون	indirection	غیر مستقیم، بدون جهت
high-level languag	زبان سطح بالا	indirectly	بطور غیرمستقیم
holography	ایجاد تصویر لیزری / سه بعدی	individual	شخص، فرد
host	میزبان	industry	صنعت
hosting	میزبانی	inexpensive	ارزان
huge	عظیم، بزرگ	influential	موثر
hyperlink	ابر لینک	information	اطلاعات
hypermedia	ابر رسانه	infrastructure	زیرساخت، زیربنا

ingredient	اجزا	interpretation	تفسیر
initiate	راه انداختن	interpreter	مفسر، مترجم
innovation	اختراع، نوآوری	intranet	شبکه داخلی، اینترانت
inquiry	پرسش	invent	اختراع کردن
institution	موسسه	inventory	فهرست وار، فهرست
instruction	دستور	invoke	احضار کردن
instrumental	مفید، موثر	joystick	دسته فرمان
integrate	جمع / ادغام کردن	judge	قاضی
integrated	جامع، مجتمع	jukebox	گرامافون
integration	ادغام، ترکیب	jumper	وصل کننده، اتصال ساز
intelligence	هوش	just-in-time	درست بموقع
intense	قوی	kernel	شالوده، هسته اصلی
interaction	تعامل	keyword	کلمه کلیدی
interconnected	بهم متصل شدن	knit	همبسته
interdisciplinary	میان رشته ای	knowledge	دانش
interface	واسط، رابط	lever	دسته، اهرم
interior	درونی، داخلی	licenses	گواهی نامه
intermediate	طبقه میانی	life-critical	حیاتی
internal	داخلی	life-cycle	چرخه حیات
internet	شبکه جهانی	likelihood	احتمال
interpersonal	میان فردی	linking	بهم پیوستن، متصل کردن

live	زنده	measured	شمرده / اندازه گیری شده
load	بارگزاری کردن	media	رسانه ها، وسیله ها
local	محلی	mediate	وساطت کردن
logical operations	محاسبات / عملیات منطقی	medium	رسانه، وسیله
look forward to	چشم به راه بودن	memory	حافظه
loosely coupled	پیوند ضعیف	mental	ذهنی
low-level	سطح پایین	mesh	توری
macro	بزرگ	meso	متوسط
magnetic tape	نوار مغناطیسی	metadata	اطلاعات درباره داده ها، فرا داد
magnitude	مقدار، اندازه	metropolitan	وابسته به پایتخت، کلانشهری
mainframe	کامپیوترهای بزرگ که همزما کاربر سرویس می دهند	micro	کوچک
		middleware	میان افزار
maintaining	نگه داری کردن	minicomputer	کامپیوتر کوچک
malleable	قابل انعطاف، سازگار	mission-critical	فاکتور اصلی و اساسی
management	مدیریت	modify	تغییر دادن، اصلاح کردن
maneuver	مانور دادن	motherboard	برد اصلی
manipulate	دستکاری کردن	mount	سوار کردن
manufacture	بعمل آوردن، ساختن	multimedia	چند رسانه ای
mass	تعداد زیاد، توده	multi-tasking	چند وظیفه ای
meaningful	پرمعنی، معنی دار	multitude	گروه بسیار، کثیر
measure	اندازه گیری کردن	multiuser	چند کاربره

nascent	شکوفا، در حال تکوین	optimization	بهینه سازی
natural	طبیعی	organized	سازمان یافته
navigate	هدایت کردن	orientation	موقعیت، جهت
necessary	لازم، ضروری	origin	منبع، مبدا
net books	لپ تاپ های بسیار کوچک	originally	در ابتدا
	با حافظه کم	oscillator	نوسانگر
network	شبکه	outline	خلاصه کردن
non-interactive	غیر تعاملی	paradigm	نمونه، الگو
non-volatile	غیر فرار	paradigm	شیوه، روش
notation	نشان گذاری، یادداشت برداری	parallel-processing	پردازش موازی
nuance	فحوا، ریزه کاری	participant	شریک
object	شی	participate	شرکت کردن
offline	آفلاین، برون خطی	particular	مخصوص
on demand	بنا به تقاضا و نیاز، در صورت ز	partition	قسمت بندی کردن
on the go	خیلی گرفتار	password	کلمه عبور
ongoing	مداوم	patience	حوصله، صبر
online	آنلاین، برخط	pattern	الگو
open source	متن باز	pattern	الگو، طرح
operating system	سیستم عامل	performing	اجرا کردن
operational	عملیاتی	peripheral	جانبی
operations	عملیات ، محاسبات	peripherals	دستگاهای جانبی
optical	نوری		

permanently	بطور همیشگی، دائما	primary storage	حافظه اولیه، حافظه اصلی
permission	مجوز، اجازه	principle	اصول و قاعده
permit	اجازه دادن	private	شخصی، خصوصی
perspective	چشم انداز	process	پردازش، فرآیند
pervasive	فراگیر	profession	حرفه، شغل
phase	مرحله	professional	حرفه ای
phenomenon	پدیده	programming	برنامه نویسی
pilot	پیلوت، خلبان	proliferate	زیاد شدن
pin	پین، گیره	prominent	شاخص، برجسته
plug-in	متصل شده در	promotion	ارتقا، توسعه، پیشروی
pointing	اشاره گر	prone	متمایل، مستعد
policy	سیاست، روش	property	ویژگی، مشخصه
port	پورت، درگاه	proprietary	اختصاصی
portable	قابل حمل	protection	حفاظت، محافظت
portion	بخش، قسمت	protocol	پروتکل، قرار داد
potential	عامل بالقوه	prototype	نمونه اولیه
predominant	غالب، عمده	provide	فراهم کردن
preexisting	از قبل وجود داشتن	provision	فراهم کردن / سازی
preference	مزیت	provoke	برانگیختن، تحریک کردن
presence	حضور، وجود	psychology	روانشناسی
primary	عمده، اصلی	public	عمومی

punched card	کارت پانچ	registers	ثبات های پردازنده
punched cards	کارت های پانچ شده	regulated	کنترل شده
punctuation	علامت گذاری	relational	رابطه ای
pundit	دانشمند	relationship	ارتباط، رابطه
purchase	خریداری کردن	relatively	نسبتا
purpose	منظور	release	رها کردن
quantity	کمیت	relevance	رابطه
query	پرس و جو	relevant	مربوط، وابسته
quite	کاملا	relieve	رها کردن، آسوده کردن
random	تصادفی	remote	از راه دور
reality	واقعیت، حقیقت	remote	از راه دور
real-time	زمان واقعی، بی درنگ	removable	قابل انتقال/ حذف
reciprocity	عمل متقابل	render	تحویل دادن، منتقل کردن
reclassify	باز طبقه بندی کردن	replicate	تکرار کردن
recognize	تشخیص دادن	request	درخواست کردن
recovery	بازیافت	research	تحقیق
recruitment	تقویت، بکار گیری	resident	مستقر
rectangular	مستطیلی	resource	منبع
re-engineering	مهندسی مجدد	responsible	مسئول
regardless of	صرف نظر از	retain	نگه داشتن
region	ناحیه	retrieve	بازیابی کردن

sentence	جمله	بازیابی کردن
server	سرویس دهنده	گشتن، چرخیدن
service-oriented	سرویس گرا	حلقه ای
serving	سرویس دادن	قابل اعتماد، اتکا پذیر ، قوی
settings	تنظیمات	مسیریاب، راهبر
share	به اشتراک گذاشتن	روتین، امر عادی
signal	سیگنال	ماهواره
significant	قابل توجه، مهم	مقیاس، معیار
simple	ساده، آسان	برنامه، نقشه
simulated	شبیه سازی شده	محدوده، میدان
simulation	شبیه سازی	گستره، محدوده
simultaneously	همزمان	صفحه
sincerely	صمیمانه، ارادتمند	پیچ
situation	وضعیت	اسکریپت
slot	شیار	موتور جستجو
smart phones	گوشیهای هوشمند	حافظه ثانویه / فرعی
social actors	فعالان اجتماعی	محکم کردن، ایمن کردن
social network	شبکه اجتماعی	امنیت
sociogram	نگاشت اجتماعی	خود مختار، مستقل
sociolinguistics	جامعه شناسی زبان	متکی به خود
sociology	جامعه شناسی	احساس، حس

software	نرم افزار	*strict*	سختگیر
solely	به تنهایی	*strip*	تهی کردن خالی کردن
solution	راه حل	*structure*	ساختار
sophisticated	در سطح بالا ، پیچیده	*subject*	موضوع
sophistication	کمال، دلفریبی، پیچیدگی	*subscription*	اشتراک
source	منبع، مبدا	*substance*	جسم، ماده
source code	کد مبدا	*suitability*	مناسب بودن، در خور بودن
specialized	تخصصی	*supplement*	مکمل
spectrum	طیف	*suspend*	تعلیق دادن، به تعویق انداختن
spelling	املا	*swap*	عوض کردن، جانشین کردن
spider	عنکبوت	*switch*	سوئیچ، کلید
spot	مکان، محل	*symbolic*	نمادین
spreading	گسترش	*synchronized*	همگام شده، هماهنگ
stack	پشته	*synonym*	هم خانواده، هم معنی، مترادف
star	ستاره ای	*synthesis*	استنتاج، ترکیب
static	ایستا، بدون تغییر	*systematic*	نظام مند
statistical	اماری	*tablet*	تبلت
statistics	آمار	*tag*	برچسب، علامت
stereoscopic	برجسته بینی	*tailored*	در خور، مناسب
strap	بند، نوار	*task*	وظیفه، کار
streaming	جریانی، سیال	*temporarily*	بطور موقت

tend	گرایش داشتن	triads	سه گانه
term	واژه، اصطلاح	troubleshooting	اشکال زدایی، عیب یابی
terminal	ترمینال، پایانه	truly	صادقانه، واقعا
tertiary	سومین، قسمت سوم	tweet	توئیت (لغت مربوط به توئیتر)
three-dimensional	سه بعدی	unaffected	بی تاثیر
thriving	در حال شکوفایی / رشد	unauthorized	غیرمجاز
throughout	سراسر، درطول	unaware	بی اطلاع
ties	روابط	uncomplicated	ساده، روشن
time slicing	تقسیم بندی زمانی	undergo	متحمل شدن
topology	توپولوژی، جا نمایی	underlying	درزیرقرارگرفته
towards	بسوی، بطرف	unheralded	پیش بینی نشده
tower	برج	uniform	یکسان
tracker	دنبال کننده	uninformative	نا آموزنده
tracking	پیگردی، رد گیری	unique	منحصربفرد
trade-off	ایجاد تعادل، مبادله	unix	سیستم عامل یونیکس
traditional	سنتی	unpacking	باز کردن، گشودن
traffic	ترافیک، عبور و مرور	un-paid	پرداخت نشده
transaction	تراکنش، تغییر	untouchable	غیر قابل لمس
transfer	انتقال دادن	upgrade	پیشرفت کردن، ارتقا دادن
transform	تبدیل کردن، تغییر شکل دادن	utility computing	محاسبات کاربردپذیر/کمکی
transparent	شفاف	utilize	مورد استفاده قرار دادن

variety	متنوع
various	مختلف، گوناگون
varying	مختلف
vendor	فروشنده
verification	تایید، اثبات
versatile	تطبیق پذیر، چند کاره
version	نگارش، نسخه
via	بوسیله، از طریق
virtual	مجازی
virtualization	مجازی سازی
virus	ویروس
visual	بصری
warehouse	انبار، مخزن
waterfall	آبشاری
waves	امواج
wear	پوشیدن
web page	صفحه وب
web server	سرویس دهنده / سرور وب
web servers	سرویس دهنده وب
web site	وب سایت
webmaster	مسئول توسعه و نگهداری سایت
whereby	که بموجب آن
wide	وسیع
widespread	همه جانبه
wireless	بی سیم
workload	حجم / بار کاری
workstation	ایستگاه کاری
world wide web	شبکه گسترده جهانی
worldwide	در سطح جهانی، جهانی
wrist	مچ دست