

**Introduction to
Computers & The Internet**

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Lecture 2

Contents

- Computer hardware and software
- Input and output devices
- CPU
- Memory
- Storage
- Motherboard

Computers Have Two Main Parts



1. Computer Hardware
2. Computer Software

What is Computer Hardware?

- Computer Hardware is the physical part of the computer system, the machinery and equipment.
- Parts of the computer "you can see"



What is Computer Software?

- Computer Software are programs that tell the computer what to do.

Examples

- Microsoft Word-word processing program
- Microsoft PowerPoint-presentation program
- Microsoft Excel-work book program used to track, calculate, and analyze numeric data

Software

Instructions that tell hardware what to do; or, A set of instructions written in a language that the computer can understand

Two broad classifications of software:

Operating Systems (also called platform)

Applications

Hardware Components	
Case	Keyboard/mouse
Power switch	Network card
Reset switch	Modem
Hard drive	Sound card
Floppy	Video card
CD/DVD	RAM
Serial ports	Motherboard
Parallel port	Fan
USB port	Cables

1- Computer Input Devices

- Any hardware component that allows you to enter data, programs, commands, and user responses into a computer
- Input Device Examples
 - Keyboard
 - Mouse
 - Scanner
 - Bar code reader
 - Joy stick





Keyboard: This device is used to type information into the computer and contains the numbers 0-9.



Mouse: a small device, which you move across the top of the desk to move the pointer or cursor on the screen.



Image Scanner: an electronic device that generates a digital representation of an image for data input to a computer



Bar Code Reader: bar codes are the vertical zebra striped marks you see on most manufactured retail products . Bar code are read by bar code readers, which are photoelectric scanners that translate the bar code symbols into digital form.



Joy stick: is a small hand- lever that can be moved in any directions to control movement on the screen , it can include buttons to perform some actions , and it can be used for playing games on the computer.

2- Computer Output Devices

- **Computer Devices that output information from the computer.**

Examples

- **Monitor**
- **Printer**
- **Speakers**





Printer: used to make a paper copy of the information into the computer.



Monitor: T.V. like screen used to show pictures and text



Speakers: it is converts the voice signal to voice analog to be heard by the user

3- Processing Unit

Central Processing Unit (CPU)



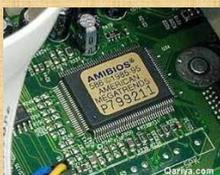
- It's the brains of the computer. Sometimes it is also called the processor or central processor.
- CPU for the computer is similar to a human brain. It is artificial but the CPU is where all the logic is applied. Everything that goes on in your PC at some point goes through your CPU
- central processing unit (CPU), is a highly complex, extensive set of electronic circuitry that executes stored program instructions
- All computers, large and small, must have a CPU.
- The central processing unit consists of two parts: The control unit and the arithmetic/logic unit

4- Memory Unit

RAM – Random Access Memory – (short-term memory) holds data and program instructions that the computer is currently using, is the most common type of memory found in computer and devices.



ROM – Read Only Memory – (usually known by its acronym rom) Is a class of storage media used in computers and other electronic devices. Because data stored in rom can not be modified(at least not very quickly or easily),it's mainly used to distribute firmware(software that is very closely tied to specific hardware, and unlikely require frequent updates)



5- Storage Units:

Internal Unit: (Hard Disk): it is located within the computer .it is the most important storage media in the computer system. It keeps software and programmes. It is composed of several magnetic disks in a single unit. Its capacity reaches to 1 terabyte (1000 Gigabyte).

The Hard disk contains many disks, (its have ability to absorb a large amount of data).Each disk is divided into sectors and each sectors divided into tracks to save data. The data is read by an arm which touches the sectors and tracks.



External Units: (Floppy Disk): it is a small and portable magnetized disk in plastic case. It is 3.5 inches square and has a 1.44MB capacity. It is used to transfer files from one computer to another. It is slower than the hard disk.

It contain only one small disk- its ability to absorb a small amount of data. This disk divided into sectors& cluster(tracks). When inserting a floppy desk into its drive it moves the metal which covers it,to enable the arm to touch the magnetic disk directly.



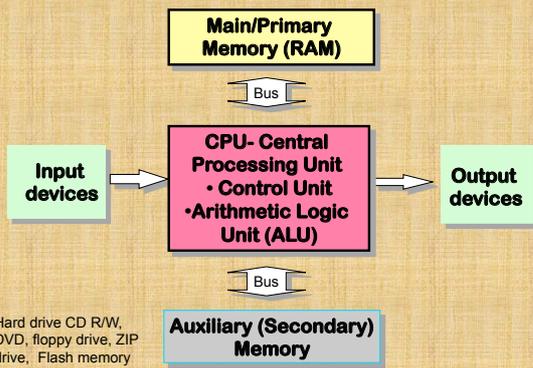
CD-ROM: is an optical disk which uses laser to read information. It can store large amount of data up to 750 megabyte. We can't add data to it unless we use (CD-WRITER) in DVD the amount of data up to 4GB



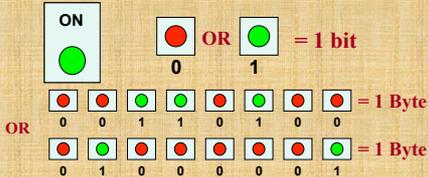
Flash memory: is a compact and easy-to-use devices that are similar in use in your computer hard drive. USB flash drives slip into your pocket.



How these Components Work Together



Storage measurement units:



- **Bit (Binary digit)** – On or off state of electric current; considered as the basic unit of information; represented by 1s and 0s (binary numbers)
- **Byte** – Eight bits grouped together to represent a character (an alphabetical letter, a number, or a punctuation symbol); 256 different combinations

Bytes

8 bits = 1 Byte
1024 Bytes = 1 Kilobyte (KB)
1,048,576 Bytes = 1 Megabyte (MB)
1,043,741,824 Bytes = 1 Gigabyte (GB)
1,099,511,627,776 Bytes = 1 Terabyte (TB)

- **Kilobyte, megabyte, gigabyte, and terabyte are terms that describe large units of data used in measuring data storage**
 - **Example: 20 GB hard drive**

measurements unit

Measurements units for (RAM):
The capacity of ram is measured by the same unit in disk(MB,GB). There is special memory in processor called (**Cash Memory**). This memory helps the processor to increase the speed of processing data. It increase the efficiency of the processor as much as the capacity of the memory. It reaches to (2GB) nowadays.

The measurement in the processor:
The speed of processor is measured by Hertz (Hz). So the processor is characterized by these Units:
MHz - GHz
1MHz = 1000 Hz
1GHz = 1000 Mz

Note :
When the capacity of RAM, Hard disk , and the speed of processor increase , the efficiency of the computer will also increase.

A Look Inside ..Case:

power supply /SMPS

cards

motherboard

CD-ROM drive

floppy drive

hard drive

Case:
It's a box and used to contain all the hardware components

Mother board. Processor.

Memory. Drives.

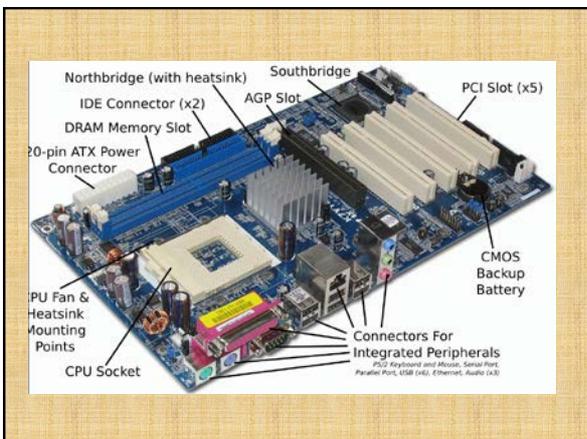
Wires. Hard disk

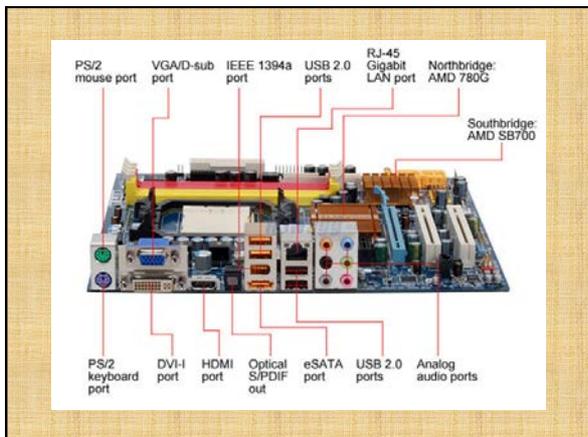
Cd-rom /DVD drive

Power Supply.

System Motherboard

- The motherboard contains the electronic circuitry of the computer.
- Components found on the motherboard include
 - The primary processing chip (CPU)
 - The memory chips
 - Expansion slots for system interface cards
 - Ports for connecting external devices
 - BIOS chips that control system startup
 - The circuitry that enables all of these components to communicate





Distribute the Electronic power: the dynamo is connected to the motherboard as a Source to distribute the power to other units in the case (processor, drivers, cards,...)

Buses: are used to transfer the data from drivers to processor and from processor to memory and vice versa

When the motherboard is modern the efficiency of computer increases also when the speed of exchanging data is high.

Drives: are the hardware which are used to read the content Of desk and CDs or to write the information on it. Each type Of disks has its own drivers. The floppies have a special drive, the Dvd has a special drive, and the hard disk uses a special drive. These drivers are fixed on the PC case.

Hard Disk – Floppy disk

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- **Memory**
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- **Motherboard**

Quiz

- **What is the difference between hardware and software?**
- **Give me 3 input devices**
- **Give me 3 output devices**
- **What does CPU stand for? What does it do?**
- **Memory – what are the two different types?**
