THE FIRST Lecturer

Computer
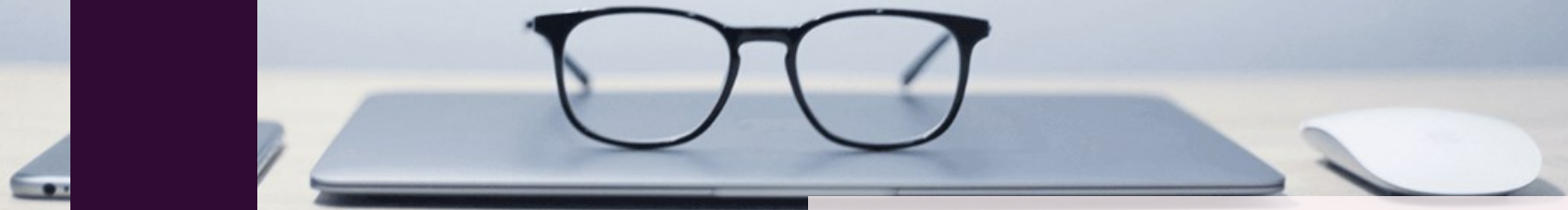
Lecturer: Abdullah Nofal

Introduction to Computer components

1. **Computer**

2. **Generations of Computers**

3. **Functionalities of a computer[2]**

4. Computer Components

5. Central Processing Unit (CPU)

6. Primary Memory

7. Secondary Memory

8. Output devices

9. Softwar

AL MUSTAQBAL UNIVERSITY
جامعة المستقبل

Computer

- A computer

  is an electronic device, operating under the control of instructions stored in its own memory that can accept data (input), process the data according to specified rules, produce information (output), and store the information for future use

| ① Monitor | ③ System unit | ⑤ Speaker | ⑦ Keyboard |
| ② Modem | ④ Mouse | ⑥ Printer | |

Generations of Computers

✧ First generation (**1950-1959**) Vacuum Tubes

✧ second generation (1959-1965) Transistors

✧ Third generation **(1965-1975) Integrated Circuits**

✧ fourth generation **(1975-1985) Microprocessors**

✧ Fifth generation **(1985-Present) Artificial Intelligence**

The history of computer development is often referred to the different generations of computing devices. Each generation of computer is characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful, more efficient and reliable devices.

First generation (1950-1959) Vacuum Tubes

second generation (1959-1965) Transistors

Third generation (1965-1975) Integrated Circuits

fourth generation (1975-1985) Microprocessors

Fifth generation (1985-Present) Artificial Intelligence

Functionalities of a computer[2]

☐ Takes data as input.

☐ Stores the data/instructions in its memory and use them when required.

☐ Processes the data and converts it into useful information.

☐ Generates the output
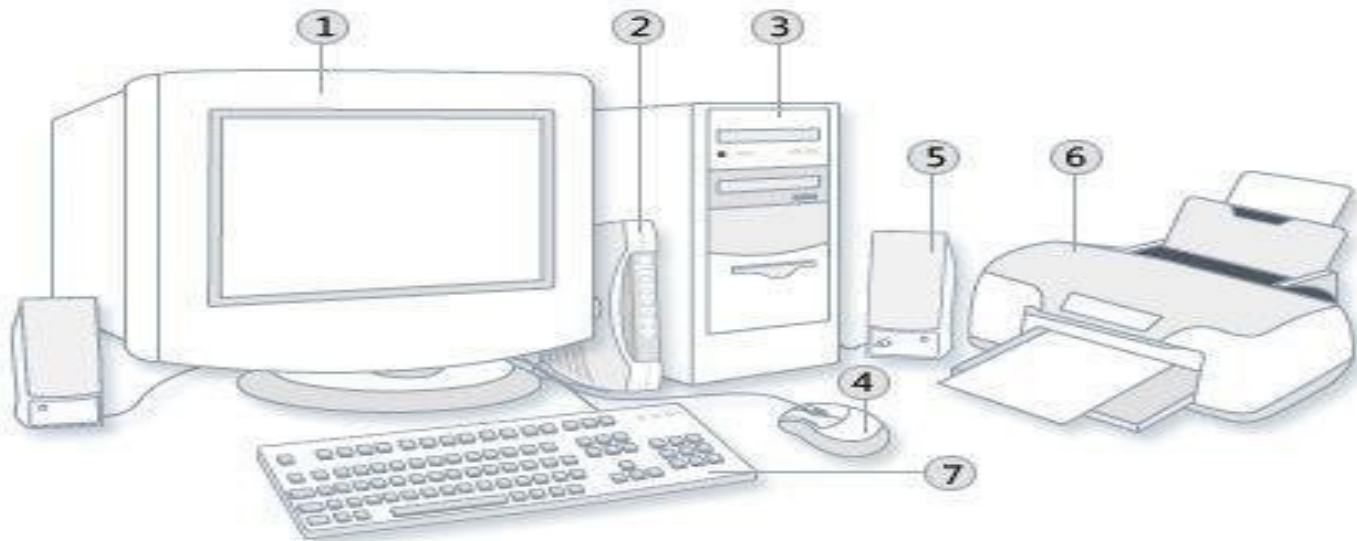
☐ Controls all the above four steps.

Computer Components

✧ Hardware

✧ Computer hardware is the collection of physical elements that constitutes a computer system. Computer hardware refers to the physical partsor components of a computer such as the monitor, mouse, keyboard, computer data storage,hard drive disk (HDD),

✧ system unit (graphic cards, sound cards, memory, motherboard and chips), etc. all of which are physical objects that can be touched

✧ Software

✧ Software is a generic term for organized collections of computer data and instructions, often broken into two major categories: system software that provides the basic non-task-specific functions of the computer, and application software which is used by users to accomplish specific tasks

① Monitor ③ System unit ⑤ Speaker ⑦ Keyboard
② Modem ④ Mouse ⑥ Printer

	System Software	Application Software
	Computer software, or just software is a general term primarily used for digitally stored data such as computer programsand other kinds of information read and	**Application software, also known as an application or an "app", is computer software designed to help the user to**
Example:	1) Microsoft Windows 1) Linux	1) **Opera (Web Browser)** 2) **Microsoft Word (Word Processing)** 3) **Microsoft Excel (Spreadsheet software)**
Interaction:	Generally, users do not interact withsystem software as it works in the background.	**Users always interact with applicationsoftware while doing different activities.**
Dependency:	**System software can run independently of the**	**Application software cannot run without the**

Computer Components

✧ **Input Devices**

✧ **Central Processing Unit (CPU)**

✧ Registers

✧ Primary Memory

✧ **Secondary Memory**

✧ **Output devices**

Computer Components

1- Input Devices

Input device is any peripheral (piece of computer
hardware equipment to provide data and control signals
to an information processing system such asa computer
or other information appliance

Examples of Manual Input Devices

Computer Components

Central Processing Unit (CPU)

A CPU is brain of a computer. It is responsible for all functions and processes. Regarding computing power, the CPU is the most important element of a computer system.

Control Unit   (CU)

Arithmetic Logic Unit (ALU).

Computer Components

Central Processing Unit (CPU)

* **Arithmetic Logic Unit (ALU)**: Executes all arithmetic and logical operations.Arithmetic calculations like as addition, subtraction, multiplication and division. Logical operation like compare numbers, letters, or special characters

* **Control Unit (CU):** controls and co-ordinates computer components.

| Read the code for the next instruction to be executed. |
| Increment the program counter |
| Read whatever data the instruction requires |
| Provide the necessary data to an ALU or register |

Computer Components
Central Processing Unit (CPU)

Primary Memory

1. **RAM**: Random Access Memory (RAM) is a memory scheme within the computer system responsible for storing data on a temporary

2- ROM (Read Only Memory): ROM is a permanent form of storage. ROM stays active regardless of whether power supply to it is turned on or off. ROM devices do not allow data stored on them to be modified.

Central Processing Unit (CPU)

Secondary Memory:-

1. Hard drive (HD): A hard disk is part of a unit, often called a "disk drive," "hard drive," or "hard disk drive," that store and provides relatively quick access to large amounts of data on an electromagnetically charged surface or set of surfaces.

2- Optical Disk: an optical disc drive (ODD) is a disk drive that uses laser light as part of the process of reading or writing data to or from optical discs. Some drives can only read from discs, but recent drives are commonly both readers and recorders, also called burners or writers. Compact discs, DVDs

3-**Flash Disk**

Central Processing Unit (CPU)

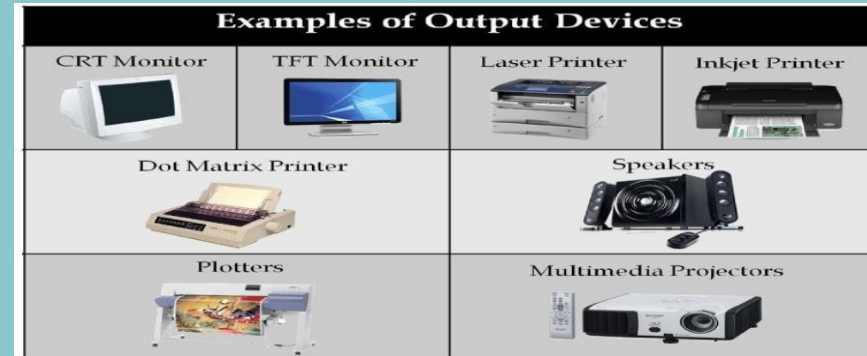Comparison between Main memory (RAM) and Secondary Memory (Hard disk)

RAM	Hard Disk (Hard Drive)
Memory	Storage
Smaller amount (typically 500 MB-6 GB)	Much larger amount (typically 80GB to 1000 GB)
Temporary storage of files and programs	Permanent storage of files and programs
A little like your real desktop - has only your current work on it (which could be ruined by a spill of Coke or coffee!)	Like a file cabinet - has long-term storage of work (it's safe from spills!)
Contents disappear when you turn off power to the computer and when the computer crashes	Contents remain when you turn off the power to the computer (they don't disappear unless you purposely delete them), and when the computer crashes
Consists of chips (microprocessors)	Consists of hard disks (platters)
When you want to use a program, a temporary copy is put into RAM and that's the copy you use	Holds the original copy of the program permanently

Computer Components

Central Processing Unit (CPU)

Output devices

An output device is any piece of computer hardware equipment used to communicate

the results of data processing carried out by an information processing system (such as a computer) which converts the electronically generated information into human- readable form.

Examples of Output Devices: CRT Monitor, TFT Monitor, Laser Printer, Inkjet Printer, Dot Matrix Printer, Speakers, Plotters, Multimedia Projectors

Central Processing Unit (CPU)

Bit byte	BIT byte	0 or 1 8 bit
Kilobyte	KB	1024 bytes
Megabyte	MB	1024 kilobytes
Gigabyte	GB	1024 megabytes
Terabyte	TB	1024 gigabytes

Speed measurement:

CPU SPEED MEASURES	
1 hertz or Hz	1 cycle per second
1 MHz	1 million cycles per second or 1000 Hz
1 GHz	1 billion cycles per second or 1000 MHz

Any Questions?