



Ministry of Higher Education and Scientific Research  
University of Babylon  
College of Materials Engineering



# Computer Hardware Components

## Lecture 3

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# Lecture Topics

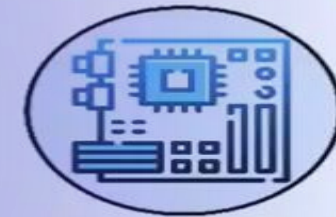
- Introduction .
- Understanding the central processing unit (CPU).
- Understanding internal storage devices.
- Introducing the student to computer ports and their types.
- Activities and Tasks .
- Conclusion



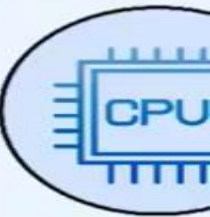
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# Introduction

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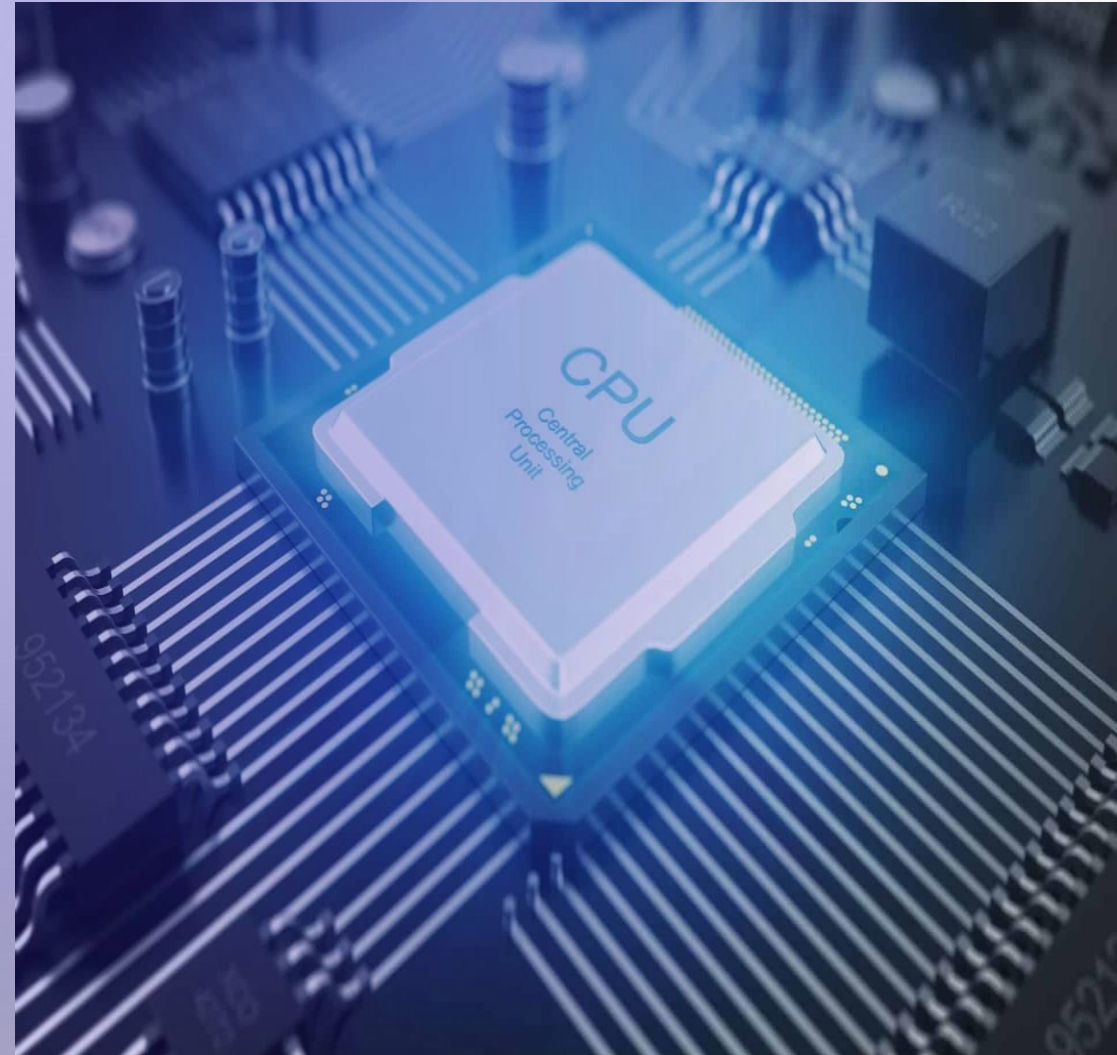
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## 4- CENTRAL PROCESSING UNIT (CPU)

The processor is the most important component inside the computer. It consists of a silicon chip encased and mounted on the motherboard via a mounting socket to receive and process data, then send the results for output or storage. Therefore, it is responsible for executing all arithmetic and logical operations and controlling the flow of data.



The central processing unit (CPU) is the brain of the computer and consists primarily of three main parts:

### 1 **Arithmetic Logic Unit (ALU)**

- Performs arithmetic operations: addition, subtraction, multiplication, and division.
- Performs logical operations: comparison (greater than, less than, equal to).
- Deals with binary numbers and data (0 and 1).

### 2 **Control Unit (CU)**

Controls and organizes the computer's processes.

Directs data between memory and input/output units.

Interprets program instructions and determines when and how to execute them.

### 3 **Registers**

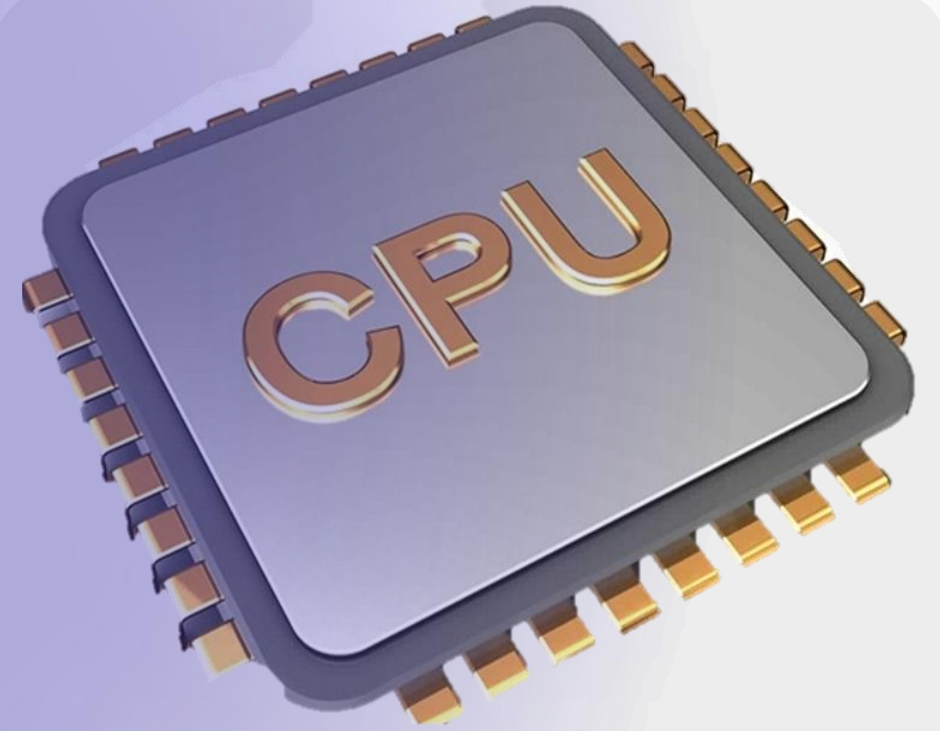
Very fast, small memory units within the processor.

Storage temporary data and instructions during execution.

They significantly increase processing speed.

# Functions of the Central Processing Unit (CPU)

- Executing program instructions.
- Controlling input and output operations.
- Processing data at high speed.
- Coordinating the interaction of all computer components.



# Activity 1

If the processor speed is high and the RAM size is small, what happens?



# 5- STORAGE DEVICES

These are units used to store data and information inside or outside the computer, such as: files, pictures, videos, programs, and the operating system, with the possibility of retrieving them later.



## Storage devices

# Types of Storage Devices

## 1 Internal Storage

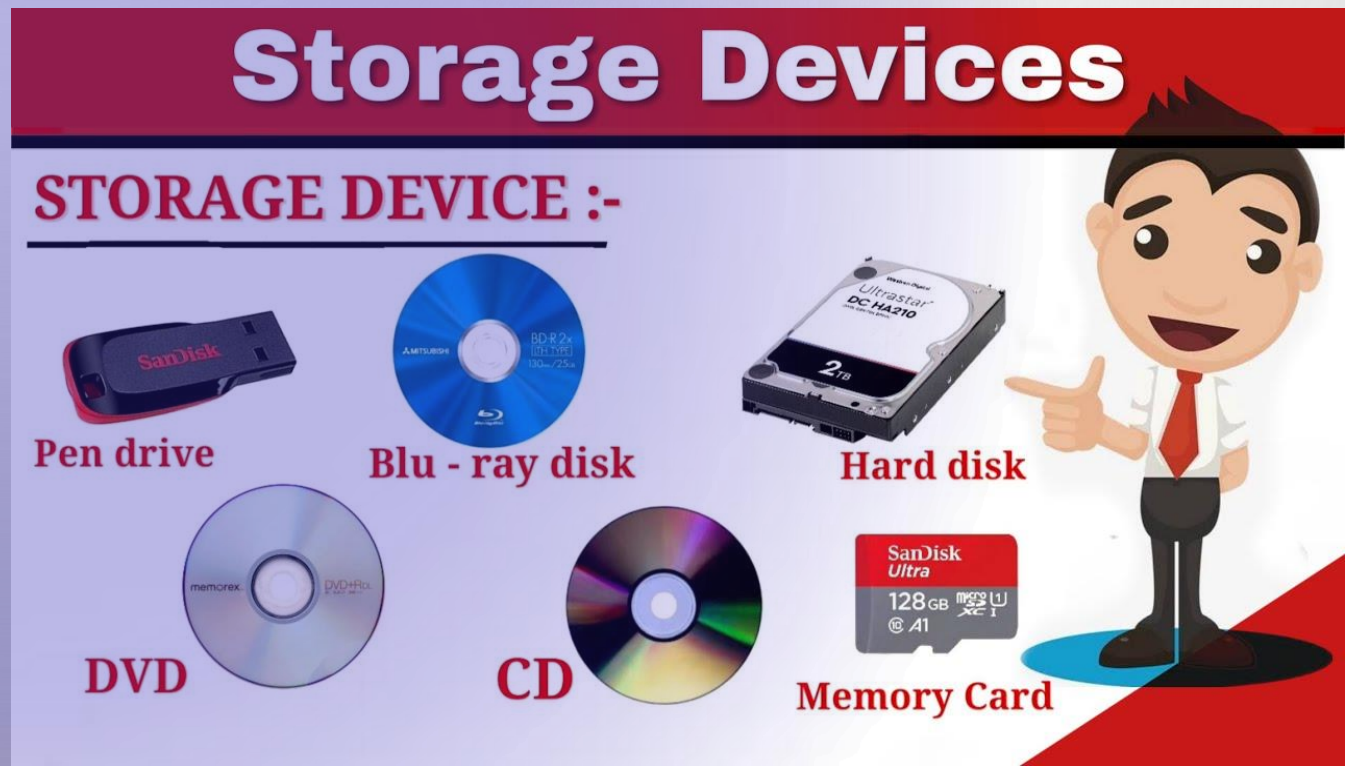
- HDD (Hard Disk Drive): Large capacity, relatively slower.
- SSD (Solid State Drive): Much faster, more durable, more expensive.

## 2 External Storage

- USB Flash Drive .
- External Hard Drives .
- Memory Cards .

## 3 Optical Storage

- CD .
- DVD .
- Blu-ray .



## **Activity 2**

What is the difference  
between a CD and a DVD?

# What Does The Word CD Mean ?

CD stands for Compact Disc. It is a digital optical disc data storage format used to store and play audio, video, and data , Compact discs (CDs) vary based on their ability to store data and their writability, most notably: CD-ROM (read-only), CD-R (recordable once), and CD-RW (rewritable and erasable).



**CD-ROM**



**CD-R**



**CD-RW**

# Explanation of CD Types

## 1. CD-ROM (Compact Disc Read-Only Memory)

- **Description:** These discs are "pressed" at the factory with data already on them. You can only read the information; you cannot add, change, or delete anything.
- **Usage:** Used for distributing commercial software, video games, and operating systems like Windows , (Like a printed book) .
- **Capacity:** 700 MB (Megabytes)

## 2. CD-R (Compact Disc Recordable)

- **Description:** These are blank discs that allow you to "burn" (write) data onto them using a CD burner. Once the data is written, it becomes permanent and cannot be erased.
- **Usage:** Great for creating personal music CDs or backing up important photos and documents.
- **Capacity:** 700 MB (or 80 minutes of audio , Once you fill the 700 MB, you cannot add more or erase) .

## 3. CD-RW (Compact Disc Rewritable)

- **Description:** This type allows you to write data, erase it completely, and then write new data again. You can repeat this process hundreds of times (up to 1,000 times).
- **Usage:** Best for temporary data storage or moving files between computers, similar to a small USB flash drive.
- **Capacity:** 700 MB (You can use the 700 MB, erase it, and use it again ) .

# What Does The Word DVD Mean ?

DVDs (short for Digital Versatile Disc) are 12cm digital optical storage media, launched in 1996, designed for high-quality video and data storage with capacities typically ranging from [number] gigabytes . They use lasers to read data and surpass compact discs (CDs) in their large storage capacity.



# The difference between CD and DVD

**Storage capacity:** DVDs can hold approximately seven times the data of CDs.

**Use:** CDs are primarily designed for audio and small files, while DVDs are ideal for movies and larger files.

**Technology:** DVDs use multiple recording layers and have a higher data density than CDs.

**Compatibility:** DVDs cannot be read in older CD players, while DVD players can read CDs.

**Speed:** DVDs offer significantly faster data transfer speeds than CDs.



# The Importance of Storage Devices

- Storing data permanently or temporarily.
- Transferring data between devices.
- Making backups.
- Running computer systems and programs.



Note



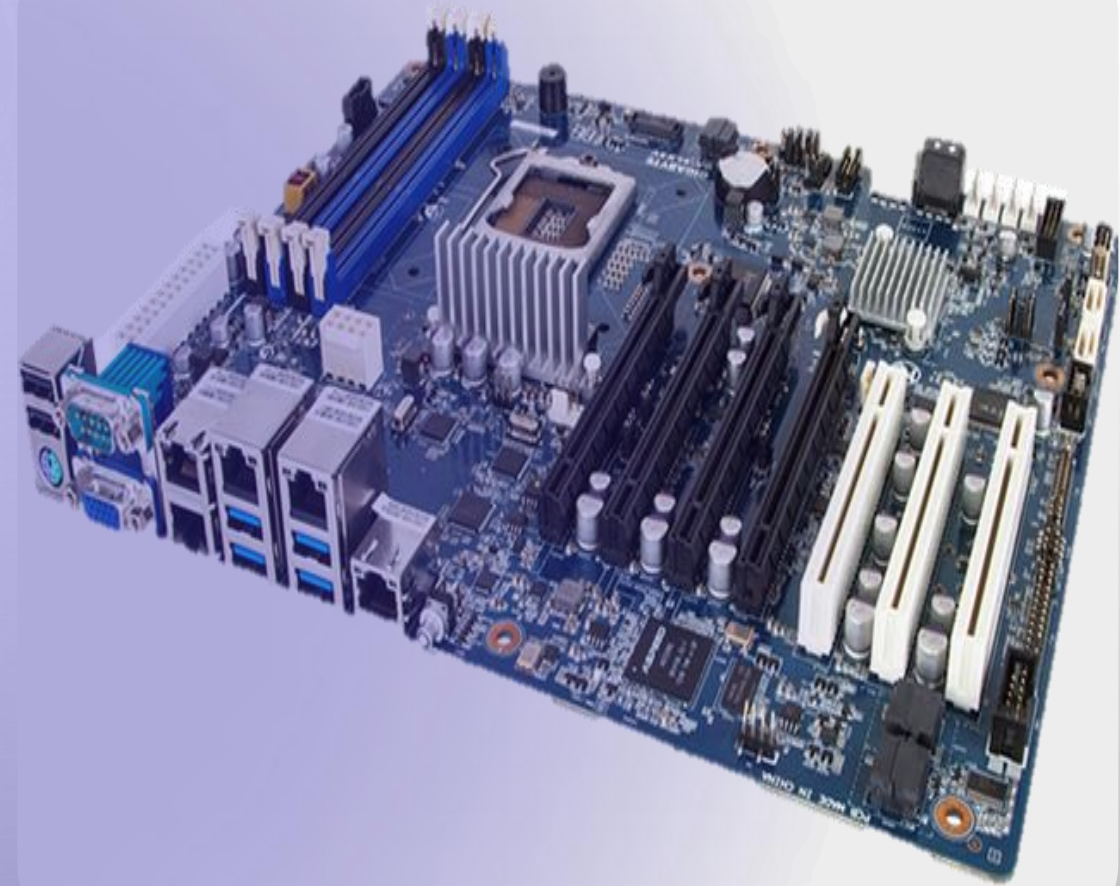
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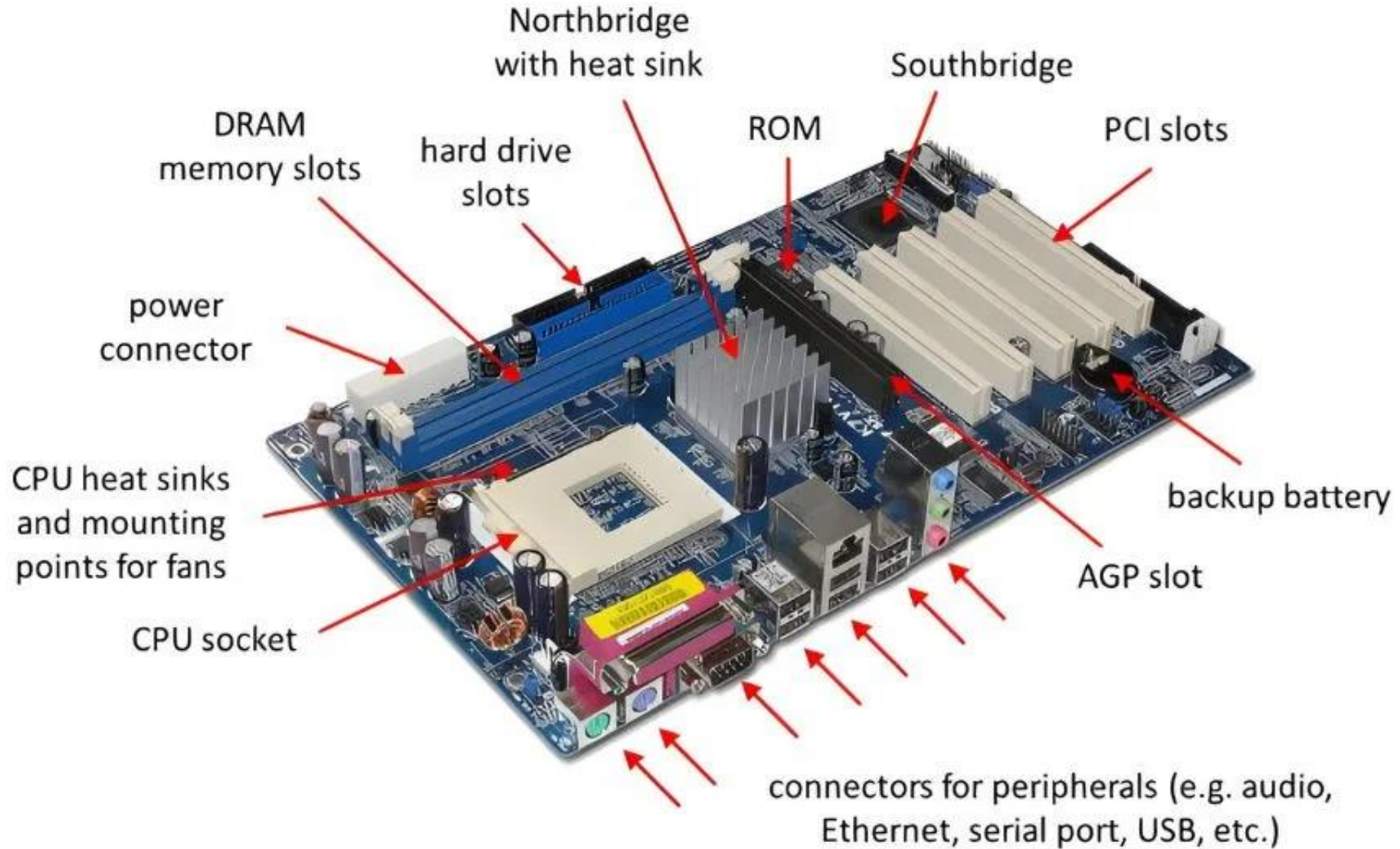
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# Motherboard

The motherboard is the main board and backbone of a computer, connecting all the components (processor, memory, graphics card, storage) to work together seamlessly. It acts as the nervous system, transmitting data and distributing power to the components, and determining the computer's capabilities and compatibility with modern hardware.



# Motherboard



# Motherboard Components and Functions

- CPU Socket: The designated slot for installing and securing the processor.
- RAM Slots: Locations for installing the system's RAM.
- PCIe Slots: For installing graphics cards, sound cards, or network cards.
- Storage Connectors : For connecting hard drives (HDD/SSD).
- Rear Panel (I/O Ports): Ports for connecting the monitor, mouse, keyboard, and USB.
- Chipset: Manages data between the processor and other components.

# Computer Ports

These are openings or interfaces found in a computer that are used to connect external devices to the computer in order to transfer data or power.



# Types of computer ports :

- ◆ **USB Port** : For connecting flash drives, keyboards, mice, and printers .
- ◆ **HDMI Port** : For connecting a monitor or projector .
- ◆ **Ethernet (LAN) Port** : For connecting to the internet .
- ◆ **Audio Port** : For connecting headphones or a microphone .
- ◆ **VGA/DisplayPort** : For connecting monitors .



# Activity 3

- 1- What are the components of a CPU?
- 2- What difference between CD and DVD ?
- 3- What Types of Computer Ports?



# CONCLUSION OF LECTURE THREE

In this lecture, we discussed the remaining hardware components (CPU, STORAGE DEVICES) in addition to explaining the operating system and its importance.



# SOURCES

- Computer Basics by Al-Khader Ali Al-Khader
- Technology in Action by Alan Evans, Kendall Martin, Mary Anne Poatsy.



Thank you

