Background Part 1 (IO Devices, CPU and Memory)

Before we begin our programming journey, it's important to understand some basic hardware concepts. This article will help you review the topics covered in the video, including input and output devices, the Central Processing Unit (CPU), different types of memory, and the role of the Operating System (OS).

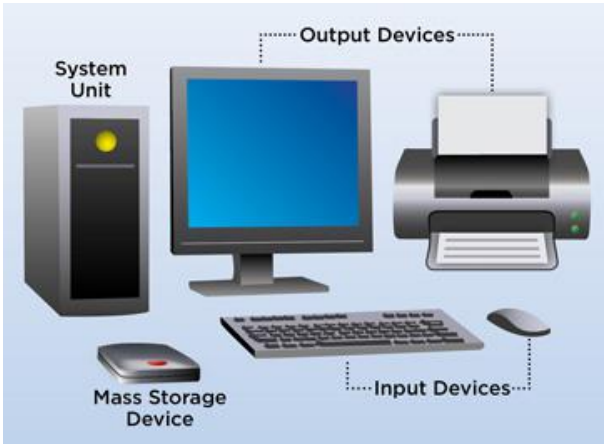
Input and Output Devices

Input Devices: These are tools we use to send information to the computer. Here are some common input devices:

- **Keyboard:** Used to type text and commands into the computer.
- **Mouse:** Allows you to move the cursor and select items on the screen.
- **Touchpad:** Similar to a mouse, used mainly on laptops to move the cursor.
- **Scanner:** Converts physical documents into digital files.
- **Microphone:** Captures audio input for the computer.

Output Devices: These devices display or produce the results from the computer. Common output devices include:

- **Display Screen:** Shows visuals like text, images, and videos.
- **Speakers:** Play sound from the computer.
- **Earphones:** Provide audio output and often include a microphone for input.
- **Printer/Scanner Combo:** Can print documents (output) and scan physical documents (input).



Example of various input and output devices connected to a computer.

CPU and Memory

Central Processing Unit (CPU): The CPU is like the brain of the computer. It performs all the calculations and processes the data you work with. Because the CPU does a lot of work, it can get hot, so it is usually kept cool with a fan.

Types of Memory:

1. **Cache Memory:**
    - Located directly on the CPU chip.
    - Provides quick access to frequently used data.
2. **Main Memory (RAM - Random Access Memory):**
    - Temporary storage for programs and data that are currently in use.
    - Data in RAM is lost when the computer is turned off.
    - When you run a program, it is loaded from the hard disk into RAM for faster access by the CPU.
3. **Secondary Storage (Hard Disk):**
    - Permanent storage for data and programs.
    - Data remains stored even when the computer is turned off.
    - Examples include internal and external hard disks, DVDs, CDs, and USB drives.

Role of the Operating System

Operating System (OS): The OS is essential software that manages all the hardware and other software on your computer. It controls how the CPU, memory, and input/output devices work together. The OS ensures that each program gets the resources it needs to run smoothly.

Examples of Operating Systems:

- Microsoft **Windows** (e.g., Windows 10, Windows 7)
- **Linux** (various distributions like Ubuntu, CentOS)
- **Unix**
- **macOS** (used on Apple devices)