First :

Computer processors (CPUs)

- Definition: A processor is the logic circuitry that responds to and processes the basic instructions that drive a computer.

- Another name of processor is central processing unit (CPU)

- We can consider it as the brain of the computer as every action the computer performs passes through the cpu.

- processors are the most significant contributor to computer performance and speed.

- The two leading CPU manufacturers are AMD and Intel
- An image of a cpu :https://assetsio.gnwcdn.com/intel_reveals_11th_gen_desktop_processors_1615895380709.jpg?width=690&quality=70&format=jpg&dpr=2&auto=webp
- There is an intel processor:

- **Main Components of a CPU:**

  - **ALU (Arithmetic Logic Unit)** – Performs arithmetic and logical operations.

  - **CU (Control Unit)** – Directs the operation of the processor by telling the computer's memory, ALU, and input/output devices how to respond to instructions.

  - **Registers** – Small, fast memory locations inside the CPU used to store data temporarily.

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- **Measuring processors:**

- CPUs are measured in the maximum number of instruction cycles they can perform **per second.**

- To measure frequency per second we use **hertz** .Modern CPUs are measured in gigahertz (GHz). One gigahertz is equivalent to **1 billion instructions per second**

-Cores: a single processing unit within the CPU that can execute instructions. More cores allow more tasks to be processed simultaneously.

- CPU speed: is a measure of how many cycles a CPU can execute per second.
Example: a CPU with a clock speed of 3 GHz can process 3 billion cycles per second.

-CPU: Intel Core i5, 3.1 GHz, Quad-core

- **Types of CPUs:**

-Desktop CPUs (e.g., Intel Core, AMD Ryzen). the core element of every computer. It is the decisive factor in the overall speed of your PC and controls all basic computational tasks, such as supplying the graphics card with data.

-Mobile CPUs (used in laptops, smartphones; e.g., Apple M-series, Snapdragon).

-**Server CPUs** (e.g., AMD EPYC, Intel Xeon). has a critical part to play in the performance of a system. All instructions and commands are handled through the processor, which acts as a relay for all incoming and outgoing data

-**Embedded CPUs** (used in IoT devices, appliances).a central processing unit built into an embedded system that controls the system's basic functions. Embedded processors are a type of microprocessor and usually have limited functions. Often, they use minimal power