Computer science

First Stage

Lec1

Introduction to computer science

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Generations of Computer

The modern computer took its shape with the arrival of your time. It had been around the 16th century when the evolution of the computer started. The initial computer faced many changes, obviously for the betterment. It continuously improved itself in terms of speed, accuracy, size, and price to urge the form of the fashionable day computer.

Generations of Computer	Time-Period	Evolving Hardware
First Generation	1940s – 1950s	Vacuum Tube Based
Second Generation	1950s – 1960s	Transistor Based
Third Generation	1960s – 1970s	Integrated Circuit Based
Fourth Generation	1970s – Present	Microprocessor Based
Fifth Generation	Present – Future	Artificial Intelligence Based

Vacuum Tube

Microprocessor
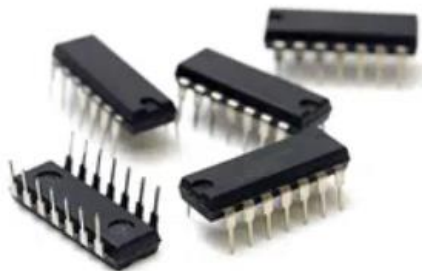
Integrated Circuit

AI-Based Computers

Basic Terms Related to Computers

The basic terms related to generations of computers are listed below.

1. **Vacuum Tube:** Vacuum tubes have the functionality of controlling the flow of electronics in a vacuum. Generally, it is used in switches, amplifiers, radios, televisions, etc.
2. **Transistor:** A transistor helps in controlling the flow of electricity in devices, it works as an amplifier or a switch.
3. **Integrated Circuit (IC):** Integrated circuits are silicon chips that contain their circuit elements like transistors, resistors, etc.
4. **Microprocessors:** Microprocessors are the components that contain the CPU and its circuits and are present in the Integrated Circuit.
5. **Central Processing Unit (CPU):** The CPU is called the brain of the computer. CPU performs processing and operations work.
6. **Magnetic Drum:** Magnetic Drum is like a cylinder that stores data and cylinder.
7. **Magnetic Core:** Magnetic cores are used to store information. These are arrays of small rings.
8. **Machine Language:** Machine Language is the language that a computer accepts (in the form of binary digits). It is also called low-level programming language.

9. **Memory:** Memory is used to store data, information, and program in a computer.
10. **Artificial Intelligence:** Artificial Intelligence deals with creating intelligent machines and behaviors

Computer hardware:

Computer hardware refers to the physical components that make up computer system, such as the case, central processing unit (CPU), monitor, mouse, keyboard, computer data storage, graphics card, sound card, speakers and motherboard.

Software:

is a set of instructions and documentation that tells a computer what to do or how to perform a task. Software includes all different programs on a computer, such as applications and the operating system.

**Applications**: are programs that are designed to perform a specific operation.

operating system: we will be talking about it later.

List of computer hardware:

- Motherboard
- Video card
- Sound card
- Hard drive
- Optical drive
- USB ports
- Power supply

Motherboard:

The motherboard is the main component of a computer. It is a board with integrated circuitry that connects the other parts of the computer including the CPU, Primary Memory, Secondary Memory.
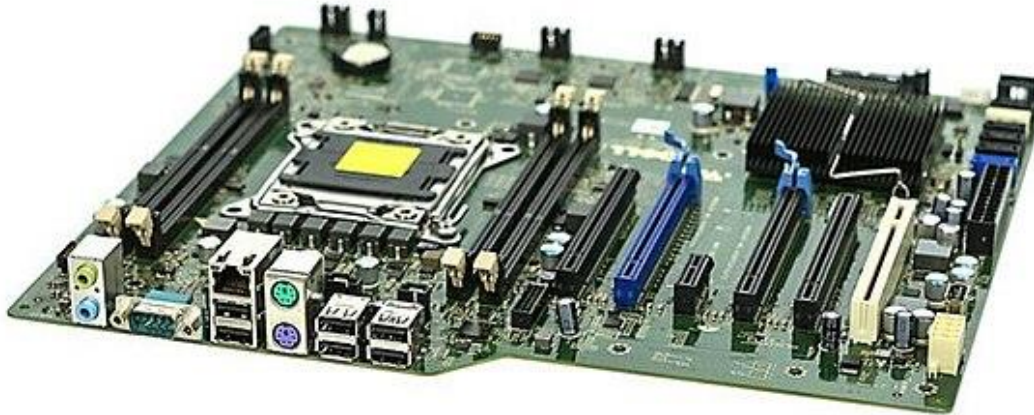
central processing unit (CPU):

is the electronic circuitry within a computer that executes instructions that make up a computer program, or is the computer component that's responsible for interpreting most of the commands from the computers other hardware and software also called a central processor, main processor or just processor.

The CPU is comprised of three main parts:

1- **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**.**

2- **Control Unit (CU):** directs the operation of the processor. It tells the computer's memory, arithmetic logic unit and input and output devices how to respond to the instructions that have been sent to the processor**.**

3- **Registers:** Stores the data that is to be executed next.

Primary Memory:

Random-access memory (RAM): Is the physical hardware inside a computer that temporarily stores data, serving as the computer working memory.

additional RAM allows a computer to work with more information at the same time, which usually has a dramatic effect on total system performance.

Read-only memory (ROM): is a permanent form of storage. ROOM 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.
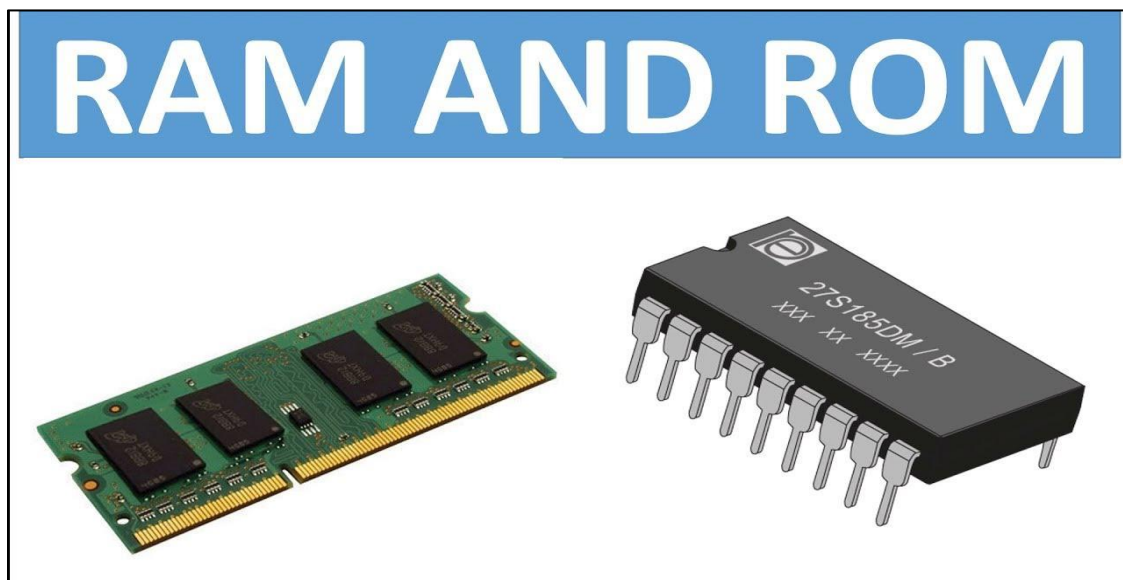
Secondary Memory:

1-   Hard drive

2-   Optical Disk

3-   Flash Disk