Lecture - 02

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Outline

- Components of a computer system
- RAM
- ROM
- Difference between RAM and ROM

Components of a computer system

- **Computer components:**

All the different pieces of electrical hardware that join together to make up the complete computer system.

- **What is a computer system?**

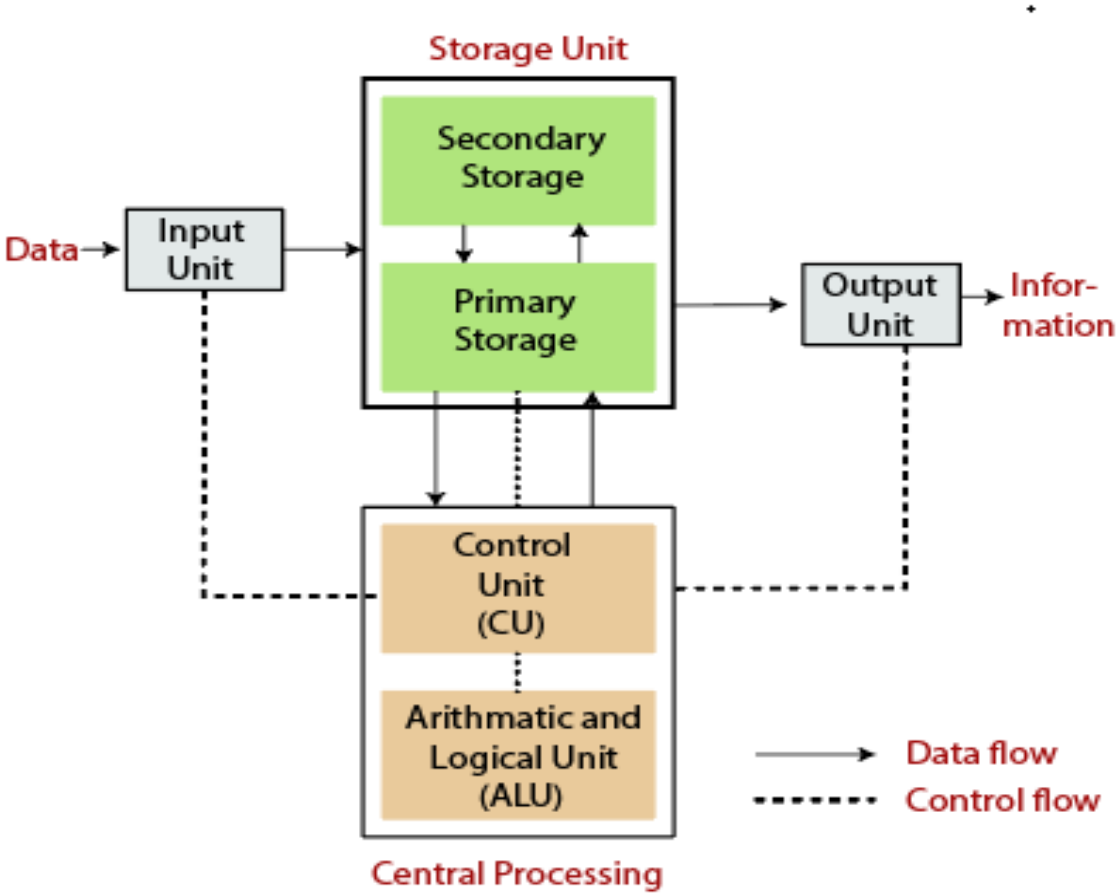
A computer system is a basic, complete and functional hardware and software setup with everything needed to implement computing performance.

Components of a computer system – cont.

The Basic components of computer system are given below :

1. Input unit (input devices)
2. Output unit (output devices)
3. CPU
   - Control unit (CU)
   - Arithmetic logic unit (ALU)
   - Main memory unit(MMU)
4. Storage unit
   - Primary memory
   - Secondary memory

Block diagram of computer



Input unit:

- When a user inputs data into a computer with the help of an input device. So that process is called the input unit.
- For example, a keyboard is an input unit that enters numbers and characters. Similarly, even a mouse can be an input unit for entering directions and commands. Other examples include touch-screens, scanners, cameras, joysticks, and microphones.

Output unit:

- When we input data into a computer, and after input, processing takes place.
- And after processing, the result which comes on our computer screen is called soft copy output.
- And when we print it, the hard copy is output. This process is called the output unit.

Output Unit: - Cont.

- For example a monitor is a an output device. The output of any input that appears on your monitor screen. Other examples include printer, projector, plotter, sound speaker etc.

CPU – Control Unit (CU)

- In our computer system, the control unit (CU) is the part.
- Without a control unit, our computer systems cannot do any work correctly.
- The control unit is in the CPU (Central Processing Unit).
- The work of a control unit is that given to the instruction of computer is he working properly or not.

CPU – Arithmetic and Logic Unit (ALU)

- The arithmetic and Logic Unit is the main part of the CPU.
- We do any work in a computer. So all that work is done with the help of the Arithmetic and Logic Unit.
- Arithmetic Unit works the mathematical unit has the ability to perform all the normal operations of addition, subtraction, multiplication, and division at a very high speed.

CPU – Arithmetic and Logic Unit (Cont.)

- The logic unit's job is to make a decision.
- Whenever we give an instruction to a computer, the work of a logic unit is that the instruction has been given to the user that data is Arithmetic data or Logic.

Storage Unit:

- There are two types of memory in a computer.
  - Permanent storage and
  - temporary storage.

- Permanent storage is those which store and store all the data of the computer. Whenever that data is needed, then we can get that data.

- Temporary storage is the storage that is stored for some time. Whenever we work on our computer or who do input. And the result that comes after inputting. So that result stays on our temporary storage. Our temporary storage gets deleted after a computer shut down.

Storage unit – cont.

- There are two types of storage device.
  - Primary Storage Device
  - Secondary Storage Device
- Primary Storage - Primary Storage Device is a main memory of a computer device.
- There are Two types of Primary Storage Devices.
  - Random Access Memory (RAM)
  - Read-Only Memory (ROM)

Storage Unit – Cont.

- Secondary Storage - A storage device that is used by a computer user is called a secondary storage device.

- There are Different Types of Secondary Storage Device.
  - Hard Disk (HDD)
  - Solid Sate Drive (SDD)
  - Pen drive
  - CD Rom etc.

RAM – Random Access Memory

- Random access memory which is also known as RAM is generally known as a main memory of the computer system.
- It is called temporary memory or cache memory. The information stored in this type of memory is lost when the power supply to the PC or laptop is switched off.

RAM – Random Access Memory (Cont.)

There are two Types of RAM:

- Static RAM, or SRAM
- Dynamic RAM, or DRAM

ROM – Read Only Memory

- It stands for Read Only Memory. ROM is a permanent type of memory.
- Its content is not lost when the power supply is switched off.
- The computer manufacturer decides the information of ROM, and it is permanently stored at the time of manufacturing which cannot be overwritten by the user.

ROM – Read Only Memory (Cont.)

- Types of ROM :

Programmable ROM (PROM), Erasable programmable ROM (EPROM), Electrically Erasable programmable ROM (EEPROM), Mask ROM.

Difference between RAM and ROM

RAM	ROM
RAM is a volatile memory which could store the data as long as the power is supplied.	ROM is a non-volatile memory which could retain the data even when power is turned off.
Data stored in RAM can be read, erased and modified.	Data stored in ROM can only be read.
It is a high-speed memory.	It is much slower than the RAM.
The CPU can access the data stored on it.	The CPU can not access the data stored on it unless the data is stored in RAM.
Large size with higher capacity.	Small size with less capacity.

Difference between RAM and ROM – cont.

RAM	ROM
RAM is used as CPU Cache, Primary memory.	Firmware, Micro-controllers
The data stored is easily accessible	The data stored is not as easily accessible as in RAM
RAM is costly	ROM is Cheaper than RAM
Types: DRAM, SRAM.	Types: PROM, EPROM, EEPROM, Mask ROM.

Differences between primary and secondary storage

Primary storage	Secondary Storage
Used to hold running program instructions	Used to stored program
Used to hold data, intermediate results and results of ongoing processing of job	Used to hold data and information of stored jobs
Fast in operation	Slower than primary storage
Small capacity	Large capacity
Expensive	Cheaper than primary storage
Volatile	Non-volatile

Necessity of I/O devices

- In computing, input/output is the communication between an information system and the outside world, possibly a human or another information processing system. Inputs are the signals or data received by the system and outputs are the signals or data sent from it. I/O devices are used by a person to communicate with a computer. It is the communication medium between user and the computer. Without input and output units there will not be a computer.

  - Input device- Keyboard, Mouse , Scanner
  - Output device- Monitor, Printer, Speakers.

Categories of input devices

- Typing Device. Example: Keyboard
- Pointing Device. Example: Mouse, Joystick, Trackball, Touch Screen.
- Optical Reading Device. Example: Bar Code Reader, OCR, OMR, HPR- Hand Point Recognition, Scanner.
- Magnetic Reading Device. Example: Floppy Disk Drive, External Hard Drive, USB Port
- Audio Input Device. Example: Microphone, Voice Recognition Unit.
- Connectivity Device. Example: Bluetooth, Infrared, Wi-Fi, Modem/Router

Peripheral devices

- **A peripheral device** is generally defined as any auxiliary **device** such as a computer mouse or keyboard that connects to and works with the computer in some way. Other examples of **peripherals** are image scanners, tape drives, microphones loudspeakers, webcams, and digital cameras.

Any Questions?

Thank You