

UNIT I

Fundamentals

* Computer → does the human work & minimizes the workload of humans.
- Electronic Machine (Hardware & Software)

1. I/p - users (I/p device - keyboard, Mouse)
2. Processing - CPU (Control Processing Unit) (Brain of computer).
3. O/p - Monitor, printer.

Programming language, Machine language.

Computer Hardware

→ physical components.

→ Function efficiently & produce useful output only when h/w & s/w work together.

→ Internal Computer Hardware.

process/store the instructions delivered by the program/os.

1. Mother board
2. CPU
3. RAM
4. Hard drive
5. Solid state Drive
6. Optical Drive
7. GPU
8. NIC
9. Heat sink

- ① Mother Board → Central hub.
holds the CPU & functions are carried out.
- ② CPU - brain of computer. Clock speed - measures the computer performance & efficiency.
- ③ RAM - Temporary Memory. Volatile Memory (Stored data is cleared when computer is switched off).
Information is immediately accessible to programs.
- ④ Hard drive - Store Temporary & permanent data.
- ⑤ SSD - Non-volatile, safe to store. Data remains permanent even when the computer is switched off.
- ⑥ GPU - Extension to CPU. Graphical Data.
- ⑦ NIC - Connect to Network / LAN / N/w Adapter.

External Hardware Components.

* peripheral components, controls either I/p or o/p functions

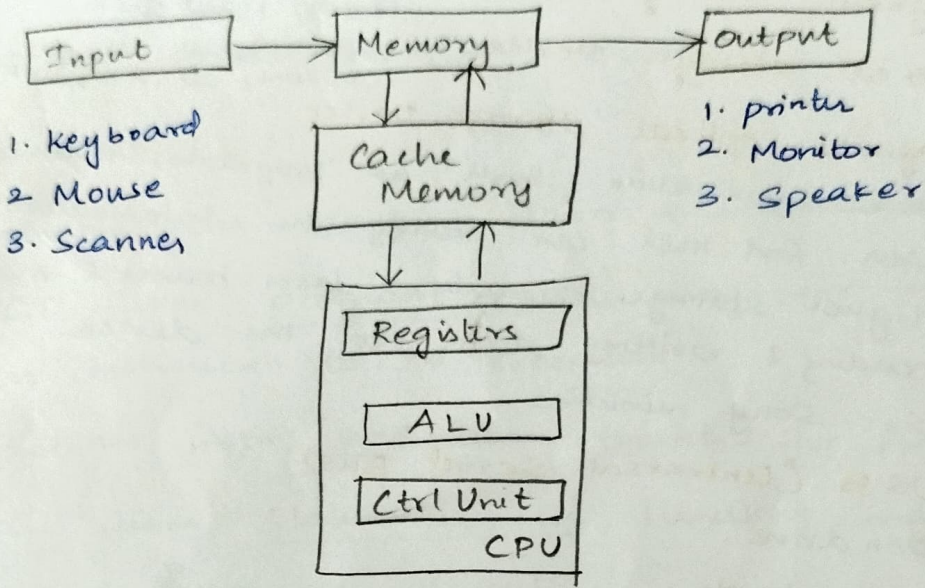
1. Mouse.
2. keyboard
3. Microphone
4. Camera
5. Memory Card.

Hardware - Tangible components - run the instruction provided by the software.

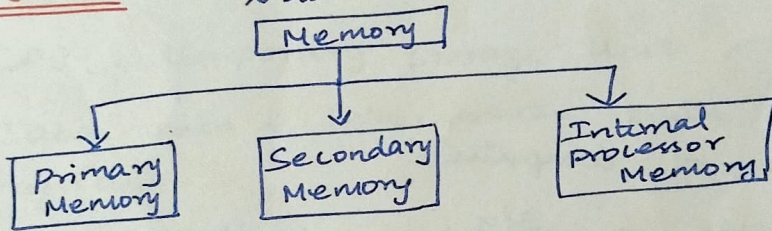
Software - Intangible components - User - H/w - interact & Command - Specific task.

- ① Application Software
- ② System Software.

Basic Computer Organization.



② Memory Unit → Store data & instruction & intermediate processing results & Final processed information.



Primary Memory.

- * Built-in unit of the computer
- * Data is stored in machine understandable binary form

① ROM (Read-only Memory) - (Non-volatile)

- permanent memory contents cannot be changed by end user.
- BIOS information - which performs POST (power-on self test).

② RAM - Volatile

- Temporary memory. power off contents get erased.
- Data is of no usage, contents are erased.

③ Cache Memory

- Store data & related application that was last processed by CPU
- CPU & main memory - intermediate cache is placed

Secondary memory.

- * External storage device connected to computer.
- * Connected externally. Non-volatile.

① Magnetic storage device → read, erased & rewritten.
Floppy, Hard disk

② Optical storage device → laser beam.
CD-ROM, CD-RW, DVD

③ Magneto-optical storage device.

store information such as programs, files & backup data. End user can modify the information.

Higher storage capacity → laser beams & magnets for reading & writing data to the device.

Ex: Sony minidisc

④ USB (Universal Serial Bus)

pen drive.

Compactable.

Storage Capacity is large.

③ CPU

* Brain of computer

* processing in sly.

* Controls the components of sly.

Main operations

1. Fetching instructions from memory
2. Decode the inst to decide what operation to be done
3. Execute the instruction
4. Store the result in memory.

Main Components:

1. ALU
2. CU
3. Registers.

1. ALU (Arithmetic Logic Unit)

- ↳ Arithmetic operations (add, sub, mul, div)
- ↳ Logical operations (AND, OR, NOT)

2. Control Unit (CU)

- Controls the flow of data & information
- CU uses program counter reg for fetching the next instruction to be execution.
- fetches instrn and gives to ALU for processing.
- CU uses Status register handling conditions such as overflow of data.

3. Registers.

- CPU - temporary storage unit - Registers.
 - Data, instrn & intermediate results are stored in registers.
- (i) Program Counter (PC)
 - (ii) Instruction Register (IR) - instrn to be decoded by CU
 - (iii) Accumulator - results produced by CPU
 - (iv) Mem. Add. Register (MAR) - Address of next. locatn in Mem. to be accessed
 - (v) Mem. Buffer Register (MBR) - storing data sent / Received to CPU.
 - (vi) Mem. Data Register (MDR) - Data & operands.