

# COMPUTER PROGRAMMING

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- A Computer is a programmable electronic device, operating under the control of instructions stored in its own memory unit, that can accept data (input), manipulate the data according to specified rules (process), produce information (output) from the processing, and store the results for future use.
- It manipulates data in well defined manner, which are specified by prerecorded list of instructions (Program)
- Simply Computer is used to convert data into information
- Two digits combine to make data 0,1 in modern digital computer
- Collins English Dictionary:
  - A device, usually electronic, that processes data according to a set of instructions
- Ques Computer Users Dictionary:
  - A machine capable of following instructions to alter data in a desirable way and to perform at least some of these operations without human intervention

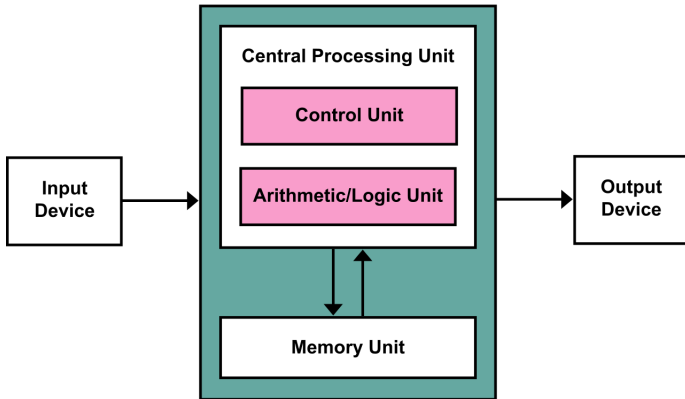


Modern Digital Computer



Charles Babbage

- Von Neumann Architecture:



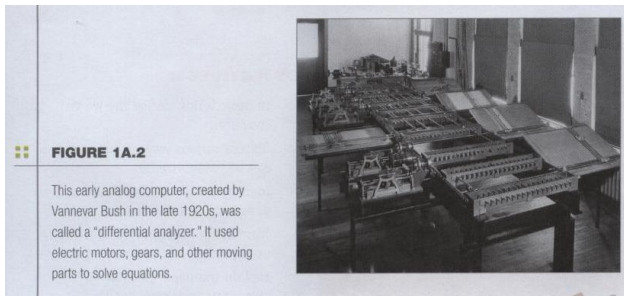
- Components of Computer:
  - **Hardware Components:**
    - Objects that we can touch actually.
    - Hardware refers to the physical equipment used for input, processing, output and storage activities of a computer system.
  - **Software Components:**
    - Exists as ideas, concepts but no substance.
    - Programs, those are working on hardware components. These programs gives user friendliness to the user.

- **Another type of Classification:**

- External Classification:
  - visible to the end user and most probably I/O devices.
  - Examples: CASE, Monitor, keyboard and Mouse
  - The CASE is a **box** that holds the internal components of the computer.
- Internal Components:
  - Not visible to the end user, behind the scene.
  - Examples: Mother Board, CPU, Memory, Drivers, etc



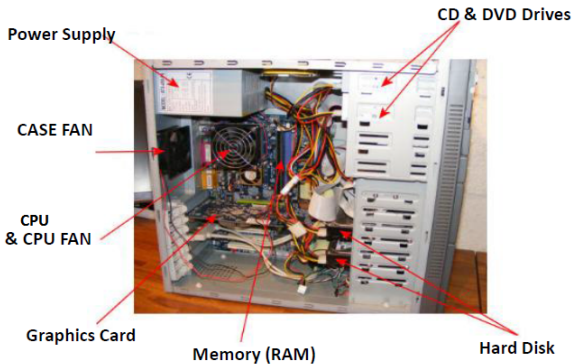
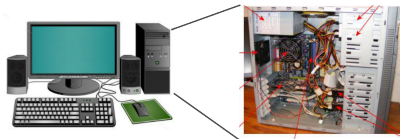
- Old Computer:
  - Older Computers were analog Computers
  - The range of values made data



- Microcomputers
  - Computers for Individual Users.
  - Examples Desktop Computers, Laptops, PDA(personal digital Assistant), tablets and smartphones etc.
- Minicomputers
  - Used by small businesses firms.
  - Also Called **Midrange Computers**
- Mainframe Computer
  - Mainframes computers used to process store large amount of data.
  - cost is less expensive compared to Super Computers
- Super Computer
  - Most powerful computers in terms of performance and data processing.
  - **NASA** uses supercomputers for launching space shuttles

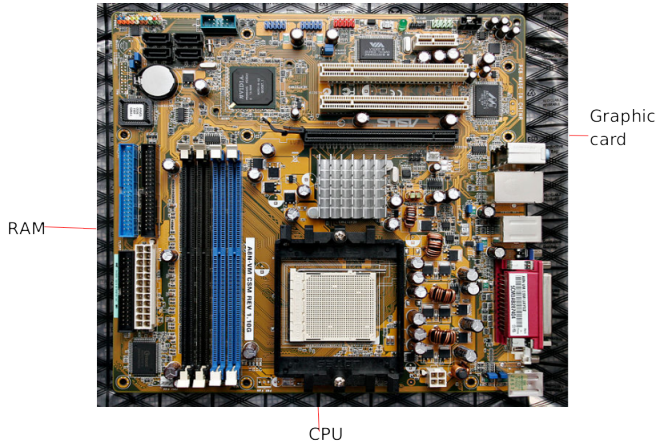
# INTERNAL COMPONENTS OF COMPUTER

Motherboard is one which connects all pc components in some way





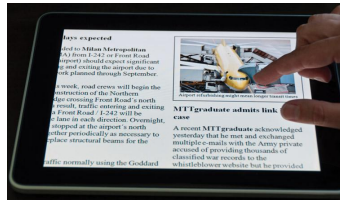
# MOTHERBOARD



- The input devices of a computer system is a peripheral hardware components that convert electronic data into electronic machine-readable form.
- The Input may be direct entry (by the end user) or through telecommunications links.
- **Examples:** Keyboard, Scanner, Voice Recognition Devices, Digital Computer Cameras, Touch Screen, Digital Pen, Pen Tablet, Mouse, etc..



Digital Pen



Touch Screen

- Output devices convert the electronic information produced by the computer system (binary or digital information) into human-intelligible form for presentation to end users.
- Examples: video display units (monitors), Printers, audio response units etc.



Printer

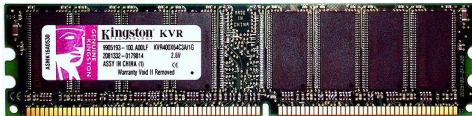


Plotter

- Memory is used to Store the data inform of bits.
- two types of memory devices
  - **Primary Memory:**
  - Examples: RAM and ROM
  - **Secondary Memory:**
  - Examples: Magnetic tapes, Magnetic discs, Optical discs, Digital versatile discs, Memory cards, Expandable storage, etc..



- Random Access Memory
- Volatile Memory
- Used to store the instructions which ready to execute
- Also called as Main Memory
- Faster than auxiliary memory
- Less in capacity compared to auxiliary memory
- Give scope to virtual memory
- It uses flip-flops to store data.

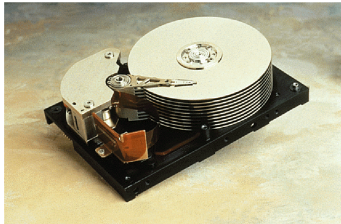


- Read Only Memory
- Non - Volatile Memory
- Used to store programs that boot the computer and perform diagnostics
- Used in Bootstrapping
- Used to do POST while booting



- To store large amount of data.
- Slower than primary memory
- it won't loss when power is off.
- Some of the common secondary storage mediums are:
  - Magnetic Disks
  - Optical Disks
  - Magnetic Tapes
- Magnetic Storage Devices are
  - Hard Disk Drives
  - Floppy Disk Drives
  - Tape Drivers

- Most computers contains one hard disk that cannot be removed from drive.
- It provides a storage area to be shared by all users of the computer.
- Generally, the programs those are needed to operate the computer system are stored here.





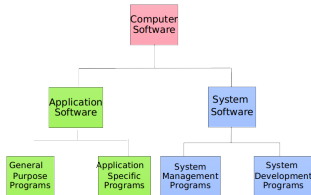
- A form of secondary storage in which a laser reads the surface of a reflective plastic platter.
- Compact disk, read-only memory (CD-ROM): A form of secondary storage that can be only read and not written on.
- Digital video disk (DVD): An optical storage device used to store digital video or computer data.
- Fluorescent multilayer disk (FMD-ROM): An optical storage device with much greater storage capacity than DVDs.

- The amount of information that can be stored on the medium

| <b>UNIT</b> | <b>Description</b>                                        |
|-------------|-----------------------------------------------------------|
| 1 bit       | 1 binary Digit                                            |
| 1 nibble    | 4 bits                                                    |
| 1 byte      | 8 bits or 1 character                                     |
| 1 KB        | 1024 bytes or half a page                                 |
| 1 MB        | 1048576 bytes or 500,000 pages                            |
| 1 GB        | 1,073,741,824 bytes or 5 million pages or 1 billion bytes |
| 1 TB        | 1 trillion bytes or 5 billion pages                       |

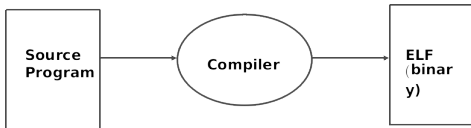
- Often referred to as the **brain** of the computer.
- Responsible for controlling all activities of the computer system.
- The two major components of the CPU are:
  - Arithmetic Logic Unit
  - Control Unit

- The set of Instructions to do a task in computer
- System Software
  - set of all instructions, which controls the hardware of the computer
  - Example : Operating System, etc
- Application software
  - Set of all Instructions , which performs a specific task given user with computer.
  - Example: E-mail, word processing, etc..



- Operating System is a System Application.
- It is placed on the top of Hardware of computer.
- It acts as a interface between application programs and hardware of computer.
- It provides user-friendly to computer.
- Some of the tasks provided by OS
  - Memory Management
  - Resource Management
  - File Management
  - Security, process management etc..

- A compiler is a program that takes high level languages (i.e. Pascal, C, C++) as input, and translates it to a low-level representation which the computer can understand and execute.



- Programs are interpreted (executed) by another program called the interpreter.
- Easy implementation of many source-level debugging operations, because all run-time errors operations.
- it is slow.

