DIGITAL COMPUTER SYSTEM ARCHITECTURE

Unit :-1 Introduction

- **What Is Computer**?

DCSA

★ **Defination Of Computer:-**

Computer Is An Electronics Device Which Is Developed by “Charles babbage”. Near by 19th Century.

★ **DCSA Full From:-**

D: Digital

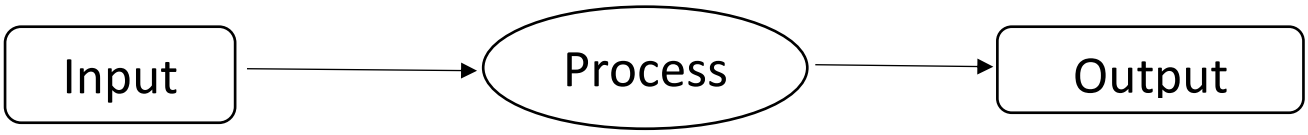
C: Computer

S: System

A: Architecture

★ **Function Of Computer:-**

It Takes Input data from Input Device. Stores And Processed It and Produce Output.



Input :- Scanner, Mouse, Keyword

Process :- CPU(Storage Device ,Brain Of Computer **)**

Output :- Monitor, Speaker, Printer

★ **Components Of Computer :-**

(1)Hardware :-

1. Physical Device
2. We Can Touch

(2) Software :-

1. Application (Ms. Office)

2.System(For Windows, Linux)

CPU Full Form :- Central Processing Unit.

★ Characteristics Of Computer :- (Speciality)

1. Speed
2. Accurancy
3. Storage
4. Quick Decision
5. Repeated Capability

Computer Full Form :-

Commonly Operating Machine Purposely Used For Technologies & Educational Research.

CPU :- Central Processing Unit

RAM :- Random Access Memory

ROM :- Read Only Memory

CPU Device Into Two Parts :-

ALU :- (Arithmatic Logic Unit)

It is Used For Mathmatical Operation

CU:- C (Control Unit)

All The Computer Works Control by This CU.

★ Memory :-

(1) HDD :- Hard disk Drive (It is Example Of Second Memory)
(2) RAM :- It Is Example of Primary Memory
(3) ROM :- It Is Also example of Primary Memory

★ Generation Of Computer :-

(1) 1st Generation (Vaccum tube-1946)
(2) 2nd Generation (Transistor-1959)
(3) 3rd Generation (Integrated Circuit (ICS)-1965)
(4) 4th Generation (Large Scale Integrated (LSIC))-1971 To 1985)
(5) 5th Generation (Ownwards 1985)

★ What Is RAM? Full Explanation

RAM Stands For Random Access Memory.

It Is Volatile Memory also known as direct Access Memory.

Volatile Memory Means (Power supply Hoga Tab Tak Ram me Memory Rahegi,power supply cut ho joyega to data erase ho jayega).

Direct Access Memory Means CPU direct data Access (kar sakta hai).

The Tasks Currently Perfomed by the CPU are Stored in RAM.

NOTE :- Ram is a part Of CPU.

2).RAM data Directly Accessed by CPU.

3).It is a very Fast Memory.

Ex. Cricket Ground…

★ TYPE OF RAM :-

(1) **SRAM :-** Static RAM

Data remains in static RAM as long as there is Power supply.

NOTE :- (1) It does not to be refreshec again & again. (data saved Rahta hai)

(2).It Is also used as cache memory.

(2) DRAM :- Dynamic RAM

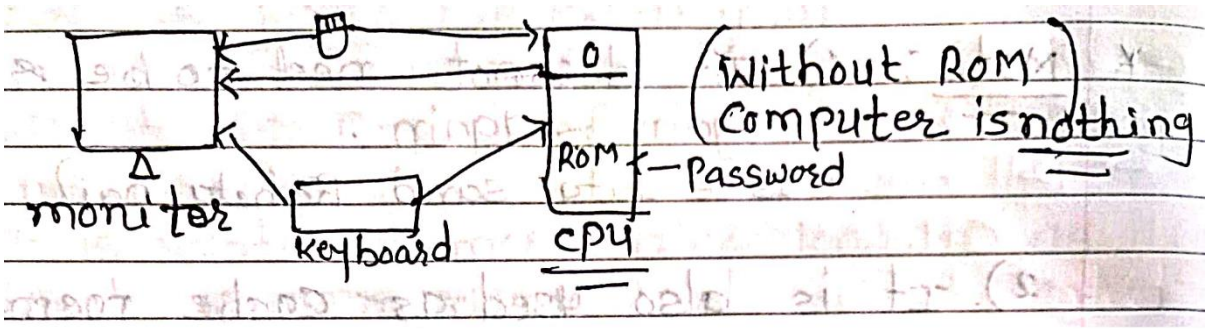
Data can be stored in the DRAM only when it is Refreshed Frequently.

★ WHAT IS ROM?

Rom stands For “Read Only Memory”.

In This Memory We Can only read but can not write on it.

Rom Data is permanently During Creation Of information That’s Why called Non volatile memory.

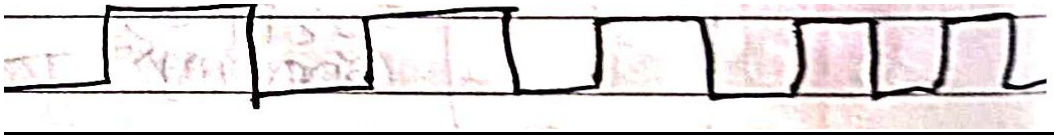


★ TYPES :-

(1) **PROM:-** Programable Read only memory.
(2) **EROM:-** Erasable PROM.(Altsavilot)
(3) **EEPROM:-** Electrically Erasable PROM.

★ DIGITAL SYSTEM :-

Figure:-



Digital Transformation is done using logic Circuits.

Data Transmission High quality.

Digital systems are flexible.

Power Consumption Is Low.(Cost Of Digital System Hige)

ANALOG SYSTEM:-

In Analog system,electronic circuits are used For the Transformation.

Not high Quality.

Analog Systems are Not Flexible.

Power Consumption Is Very High.

The Cost Of a Analog System Is Lpw.

FIG..:-

Ex. Of Analog system is electronic devices.

Ex. Of Digital system Is a Computer system.

★ LOGIC LEVELS AND PULSE WAVE FORMS :-

In binary Digital system , a Single Number is called a bit (Ex.a binary Digit) And It has value Of Either a 0 or 1,Decided by voltage is High or Low.

In Logic levels is,the voltage has Two state Which Are Represented By Two Levels,Called High & Low.

Low is represented by 0 and High is by 1 → Positive Logic

Low is represented by 1 and High is by 0 Negative Logic

Suppose High Input range From 2v To 3.3v Low Input Range From 0v To 0.8v.

If Voltage 2.5V ----- Logic circuits accept it as High Or 1.

If Voltage 1V---Invalid Single .

If Voltage 0.5V----- Low or 0.

Digital System Are use the binary Number system 0 and 1 by two different voltage High & Low.

If the high voltage level Is represented 1 and the Low Voltage Level To represent 0 is called Positive Logic System.

IF the High Voltage Level Is represent 0 And Low Voltage Level To represent 1,The System Is called Negative Logic System.

POSITIVE LOGIC SYSTEM :-

1 Is represented by +5(high) and 0 Is represented by 0V (Low).

NEGATIVE LOGIC SYSTEM :-

0 Is represented by +5V(High) and 1 Is represented by 0V(Low).

In Digital circuits are designed respond Predictably To Input Voltage That Are Within The Specified.

The Exact Value Of Voltage are Not Important and the Circuit Gives The Same Response For All Input Voltage in the allowed Range.

Both positive And Negative Logics are used in Digital System.

★ Importance :

Pulses may be Positive Pulse or a negative Pulse.

A Single pulse is generated When a Normally Low Voltage goes To High.

Digital Wave Forms Consist Of Voltage levels Changing Between the Low and High Levels.

Digital Waveforms are made up of a series Of Pulses.

★ **DIGITAL COMPUTER :-**

Digital Computer are the most Commonly used Computer On a Digital Techrique Which IS Widely used & Perfered Now Days.

Example :- PDA, Laptop ,Palmtop etc…

Change Binary Digits It Called Digital Computer.

★ **MAJOR PARTS OF COMPUTER :-**

(1) CPU , (2) Monitor , (3) Keyboard, (4) Printer, (5)Mouse, (6) Speakers.

(1) CPU :-

It is Most Important Part Of Computer.

And It is the brain Of Computer.

It Does all the tasks inside the Computer.

It Controls All The Parts, like Monitor ,Mouse & Keyboard.

(2)MONITER :- Types Of Computer Monitor.

There Are Teo types of monitors.

1).COLOUR MONITOR :- There are three basic Red, Green And Blue (RGB).

Today Colour monitor are only available.

2).MONOCHROME MONITOR :- These Monitor used only Teo basic Colours Black & White.

★ There Are Two Types Of Picture Types are Used In a Monitor.

1). CRT (cathode Roy Tube)

2). LCD (Liquid Crystal Display)

(3)KEYBOARD :- Keyword is an input device as like a typewriter machine.

It is textbase input device that allows the user to input Alphabets, Numbers& other Characters.

It has some function keys also.

It is connected With CPU.

It Consists of a set of keys mounted on a board.

(a) FUNCTION KEYS :- There are twelve function keys labelled F1,F2,F3,….F12. These keys are also known as user Programmable.

(b) ALPHANUMERIC KEYPAD :- It Consists Of Keys For English Alphabets.0 to 9 Numbers & Special Characters like +,-,?,/,(),etc.

(c) SPECIAL Keys :- These Keys Have Special Functions Assigned To them & can only For Those specific purpose. Enter, shift, Delete, Insat, caps Lock, Ctrl , ALT Escl, Etc…

(d) NUMERIC KEYPAD :- Numeric Keypad Is loxated on the right side Of the keyboard & Consists of keys having number (0 TO 9)& Mathematical operators (+,-,*,/) define On them.
This keypad is provided to support quick entry for numeric data.

(e) CURSOR MOVEMENT KEYS :- This are arrow keys&are Used to move the cursor in the direxion indicated by the arrow(Up,Down),left,right.

(4)MOUSE :- This device is worked on GUI (Graphical User Interface) based applications.

We use a mouse click to execute these Commands.

It is Connected with CPU.

It can be used to select menu Commands size, Windows, Start Programs, Icons, buttons etc…

A MOUSE CAN PERFORM FOLLOWING ACTIONS.

(i)LEFT CLICK :- Used to select on item.

(ii)Double Click :-Used to start a program or open a file.

(iii) RIGHT CLICK :-Usually used to display a set of Commands.

(iv)DRAG & Drop :- It allows you to select and move on item from one location to another.

(5)PRINTER :- Printer Is an output device used to Produce the hard Copy of Information on Paper.

It is used to Print the Result of an operation Performed by the Computer.

The Output Information is in the Permanent readable Form.

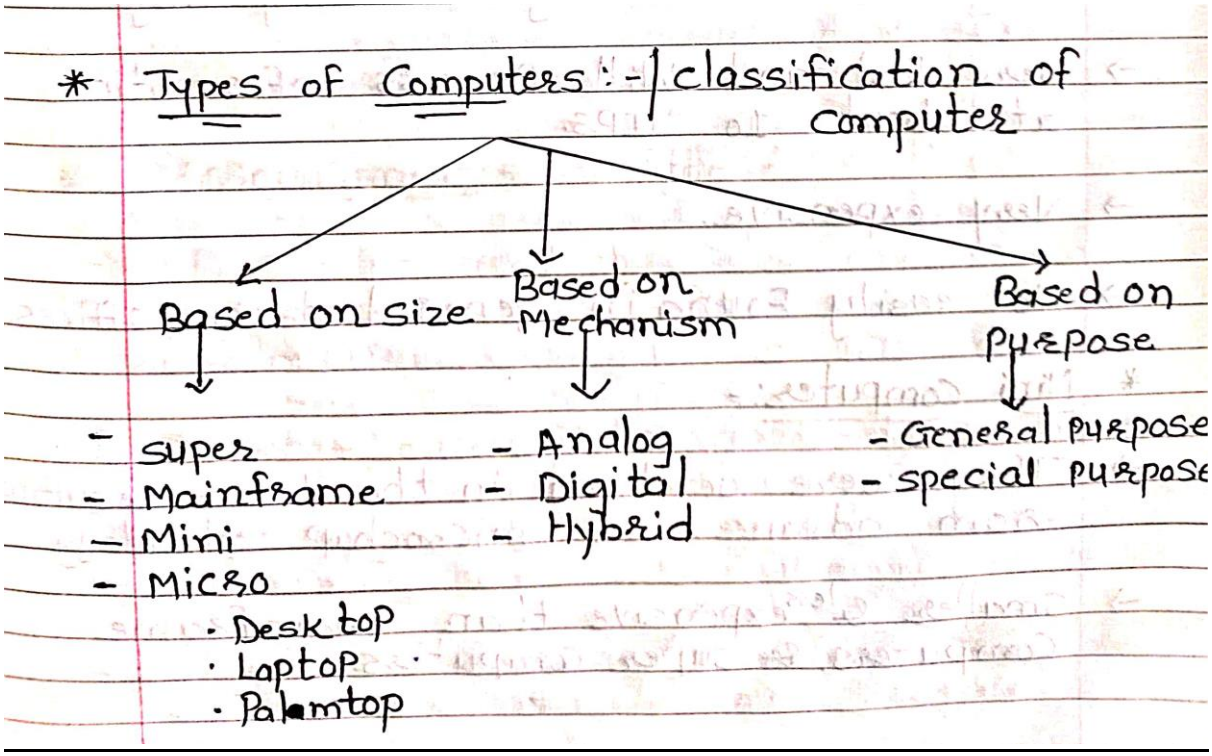
PRINTER IS DEVIDED IN TO THREE PARTS: -

(a) Character Printer
(b) Line Printer
(c) Page printer

(6)SPEAKER :- Speaker Gives output in Audio Form.

(7)SACNNER :- Scanner Is an input device.which works more like a photocopy machine.

It Is Used when some information is available on paper & it is to be transferred to the hard disk of the Computer for further Manipulation.



★ BASED ON SIZE :-

(1) SUPER COMPUTER :- Super Computer is not like Portable.
They Are very fast and powerful machine.
Run at the speed of 10 MIPS(million Instructions Per second).
Very Expensive.(Because used for scientific purform) Nt used for general application.
Ex.. Cray and CDC Cyber.

(2)MANINFRAME COMPUTER :- (Business purpose&Engineering)

They are built for general Computing.

Very fast and will Process information at about 10 MIPS.

Very Expensive.

Not easily Found in general design offices.

(3)MINI COMPUTER :-

They were developed in the 1960's Resulting From advances in microchip technology.

Smaller & less Expensive than mainframe Computer, & Super Computers.

Run at Several MIPS and Can support 5-20 Users.

Low Cost & high Performance.

(4)MICRO COMPUTER :- They Were invented in the 1970's.

Used For home Computing.

Dedicated data Processing Workstations.

Advance him technology have improved microcomputer capacities, Resulting in the explosive growth of personal Computers In Industry.

MICRO COMPUTER INCLUDE :-

A) Desktop
B) Laptop
C) Palmtop

(A)DESKTOP :- A Desktop computer is Personal Computer device.

It is designed For to fix In small Office.

It has Input storage devices like hard disk RAM.

It includes Mouse, Keyboard, Printer, etc…

(B)LAPTOP :-Laptop is a Personal Computer& It designed For Mobile use & small.

It also include desktop, Pointer device ,Touchpad, Trackpad, Speaker, Battery.

It Is portable We Can take anywhere.

(C)PLAMTOP :- Plamtop is a small computer that literally Fit on Your Palm.

Compare Of full size Computers palmtop are severally limited but they are practical For Certsin Functions such as phine book, calenders.

★ **BASED ON MACHANISM :-**

1)ANALOG COMPUTER :-

The word "Analog" means Continuously Changeable in quantity.

The Analog Computer accept input data in continuous From& Output is Obtained in the Frome Of Graphs.

EX..Voltage,Current,Sound,Speed,Temperature,Presssure etc..

The Analog Computers are Used to measure the Continuous values.

EX. Thermometer

2). DIGITAL COMPUTER :-

The word “DIGITAL” Means Separate.

It refers to Binary System, Which Consists Of Only two digits Ex.0&1

Digital data consists of binary data represented by off(Low) And ON(HIGH)Electrical Beats.

In Digital Computers, quantities are Counted rather than measured.

A Digital Computer operates by counting Numbers or digits & Gives Output In Digital Form.

Ex.. Calculators,PC,Digital Watch,Digital Thermameters etc…

3).HYBRID COMPUTER :-

They Combine the feature Of Both Analog & Digital Computers.

Analog Machine measures Patient’s Then They Are Converted To Numbers and supply to Digital Computer.

In hybrid Computers the users can Process Both the Continuous (analog) And (digital) Discontinuous data.

★ **BASED ON PURPOSE :-**

1).SPECIAL PURPOSE COMPUTER :-

These are designed to Performs a specific task such Computers lack Flexibility.

They perform the task For Which they are designed very efficiently.

Ex. Air Craft Control System, Missile guidance system etc…

2).GENERAL PERPOSE COMPUTER :-

A General Purpose Computer Is one that Can Be Used For A Variety Of Applications.

It Creativity Enables Executions Of Programs Of Almost any time.

These are used in Bussiness application.

★ WHAT IS WORKSTATIONS ?

It is a Single User Computer Although It is like a Personal Computer, it has a more Powerful Microprocessor and a Higher-Quality moniter Than a Micro Computer.

In Teams Of Storage Copacity & Speed, it Comes between a Personal Computer & minicomputer.

Workstations are Generally used For Specialized Applications Such as Desktop Publishing, Software development, & Engineering designs.

★ FEATURES & APPICATION OF WORKSTATION :-

It is a High Performance Computer System Designed for a Single user For Business of Professional.

It has larger Storage Capacity,better graphics,and more powerfull CPU than a PC.

It can Handle Animation,data analysos,CAD audio and Video Creation & editing.

Multiple Processor Cores than Simple. Laptop or Computer.

★ **ECC RAM -** It is Provided With Error Correncting Code Memory that can Fix memory Errors Before they affect the System Perfomance.

★ RAID (REDUNDANT ARRAY OF INDEPENDENT DISKS) :-

It refers to multiple internal hard drives to store or Process data.

★ SSD :-

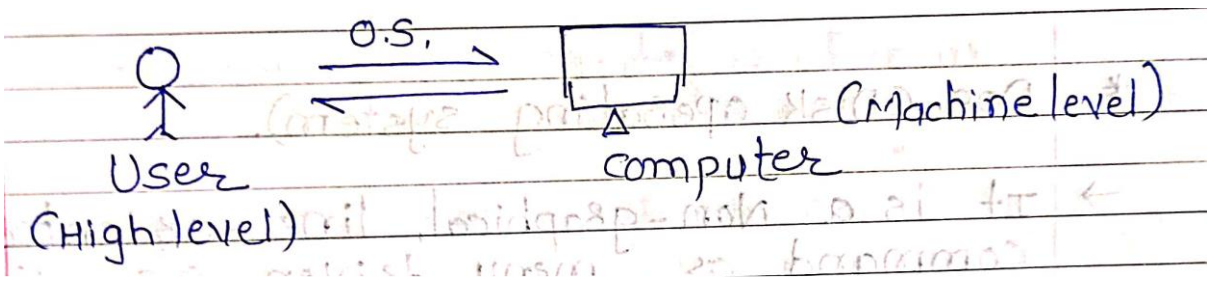
It is better than Conventional moving Parts, so the chances of physical failure are very less.

Optimized, Higher end GPU :- It Reduces the load on CPU.

★ WHAT IS OPERATING SYSTEM ?

Operating system is a collection of set of programs, Which manages all the resources Of the Computer System.

It is an… Intermediater between the user and Hardware.



★ ADVANTAGES :-

1) O.S Provides a GUI Interface For the Users.In The Form Of Menu,Icons and Buttons.
2) O.S. also allow Us To sharing the resurces with other Users.
3) It helps User to Understand the Function Of a Computer.
4) It is very Easy to use.
5) It can be easily Update.

★ DISADVANTAGE :-

If the OS is Currupted than It Will affect Entire System & the Cmputer system Will Not Work.

Only Same task run at a time.

★ DOC (DISK OPERATING SYSTEM) :-

It is a Non-graphical Line-Oriented Command Or Menu Driven O.S, With Relatively Simple Interface But Not Over"Friendly"Interface.

1st Widely Installed O.S.

1.INTERNAL COMMANDS.

2.EXTERNAL COMMANDS.

(1).INTERNAL COMMANDS :-

Means Commands Which Are part Of main File.

Ex.Command.com

-DIR,Copy,REN,DEL,CD,RD,MD,Type etc…

1). MKDIR/MD :- Allows To Crate Directories

Syntax :- md filename

2).DIR :- List of all Files in a Directory.

Syntax :- dir filename

3).COPY CON :- To Create a file in exsilting Directory.

Syntax :- Copy con Filename

4).DEL/ERASE :- To Delete any File.

Syntax :- del abc.tmp /erase abc.txt

5).DATE :- Shows the Current System date.

Syntax :-Date [/T date]

(2).EXTERNAL COMMANDS :-

It is a command which is not embedded in to Command.com & There fore Requires a Separate File to be Used.

EX. \.com Hard Disk Ms.Doc Doc.prompt

1).MORE :- To See the Contents Of a File.

Syntax :- Type Filename IMORE

2).MEM :- Display Free & Used Memory.

Syntax :- Mem

3).SYS :- Copy a file to a disk

Syntax :-Sys Drive name

4).X COPY :- Copy a directory From one location To Another.

Syntax :- XCOPY Source dir name= Target Point

5).MOVE :- Move Files From one location to another location.

Syntax :- Move Filename=Target Point.

★ **WINDOWS OPERATING SYSTEM :-** (GUI BASED)

Windows is a Very User Friendly and Popular Operating System Developed by Microsoft Corporation Company in 1985.

Windows Was Single User OS Initially but after Windows 98 it was Turned as Multiuser Multitasking OS.

★ **VERSIONS OF WINDOWS :-**

Windows 1.0

Windows 2.0

Windows 3.0

Windows 95

Windows 98

Windows XP

Windows ME

Windows Vista

Windows 2000

Windows 7

Windows 8

Windows 8.1

Windows 10

FUATURES OF WINDOWS :-

Desktop	File
Taskbar	Gadget
Start button	My Computer
Quick Access Toolbar	Log Off
Icon	Switch User

LINUX OPERATING SYSTEM :-

Unix Operating System Upgraded Version

Open Source Software

Free Available

Unix Compatibility

Easy Customize

Reliable OS

HISTORY OF LINUX :-

In 1991- By Linus Torvalds

FERATURE'S OF LINUX :-

Linux is Portable

Linux is a Multiuser & Multitasking OS

Network Information Service

Multitasking

Virtual Memory

Linux is Open