

II Organization of Computer :-

Computer organization refers to the level of abstraction above the digital logic level, but below the operating system level.

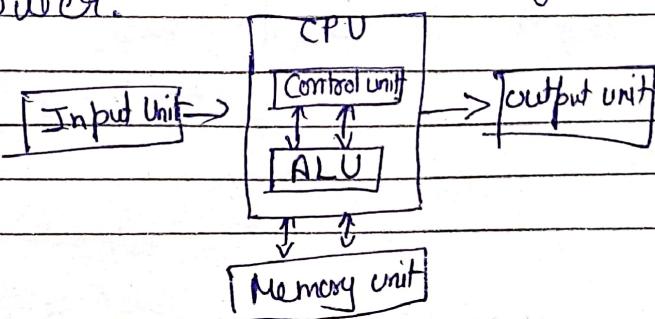
Computer organization consists of following parts:

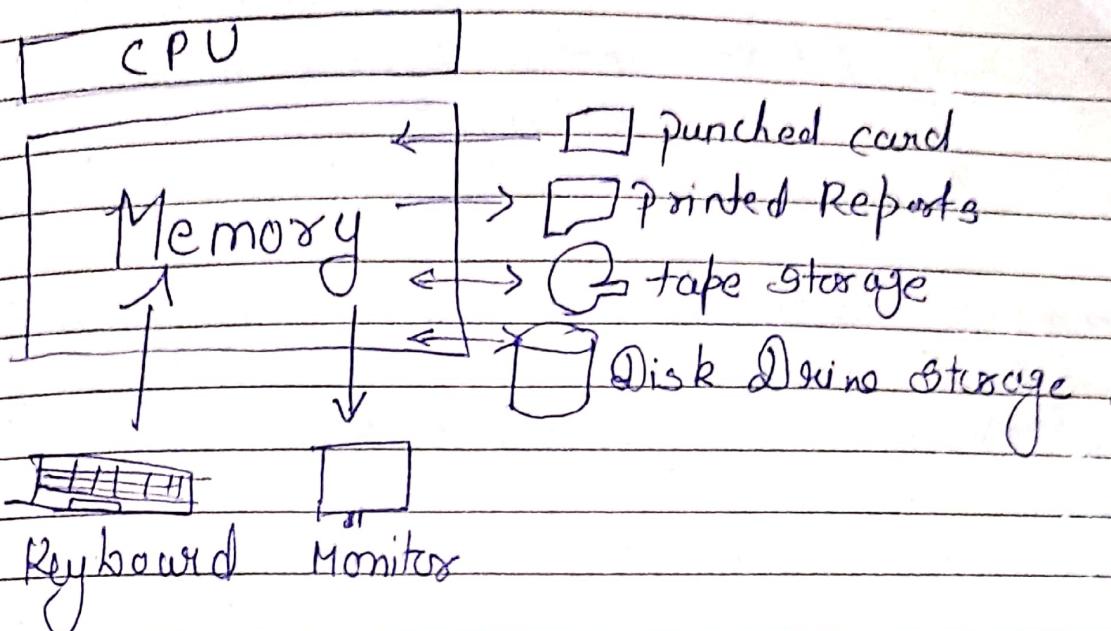
1. CPU - central processing unit
2. Memory
3. Input Device
4. Output Device

1. CPU :- It is alternatively referred to as the brain of the computer, processor, central processor or microprocessor,

The computer CPU is responsible for handling all instruction it receives from hardware and software running on the computer.

CPU performs all types of data processing operations. It stores data, intermediate result and instructions (program). It controls the operation of all parts of computer.





The Keyboard and Monitor are usually the standard input and standard output device.

* CPU itself has following three components :-

1. ALU (Arithmetic Logic Unit) :-

All arithmetic calculations and logical operation are performed using the Arithmetic & logical Unit or ALU

2. Memory unit :- A memory is just like a human brain. It is used to store data and instruction. Computer memory is use to stores information being processed by the CPU.

Q. Control unit :- help to perform operations of input unit, output unit, Memory unit and ALU in a sequence.

Memory :- Computer memory is any physical device capable of storing information temporarily or permanently.

For ex :- Random Access memory RAM is a type of volatile memory that is store information on an integrated circuit chip that is used by the operating system, software, hardware or the user.

* Computer memory divide into two parts:-

1. Volatile memory :- Volatile memory is a temporary memory that loses its contents when the computer or hardware devices loses power, e.g. RAM.

2. Non - Volatile memory :- Non - Volatile memory keeps its contents even if the power is lost.
Ex :- ROM or EPROM is a good example of an non-volatile memory.

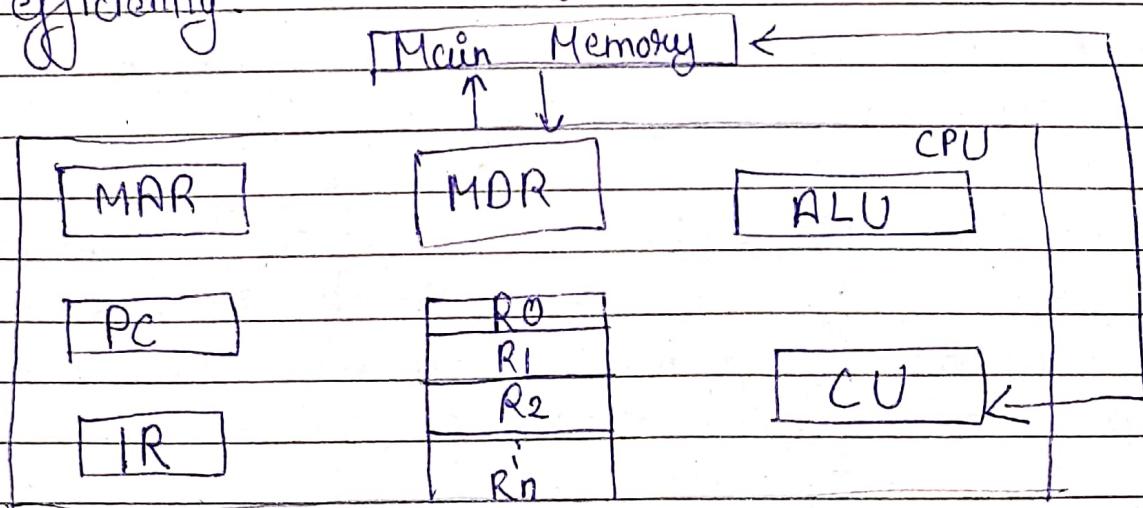
3. Input Devices:- A Device that can be used to insert data into a computer system is called as input device. It allows people to supply information to computers.

Ex :- Keyboards, mouse, scanners, digital cameras, joysticks.

4. Output Devices:- A Device which is used to display result from a computer is called as output device. It allows people to receive information from computers.

Ex :- Printer, Scanner, Monitor etc.

5. Registers → The Registers are very fast computer memory that is used to execute programs and operations efficiently.



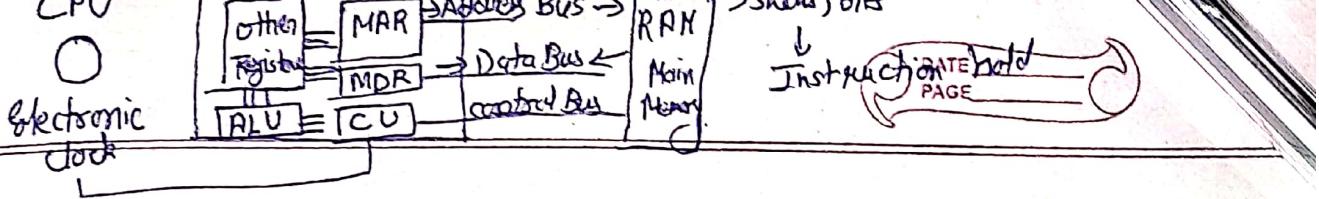
- * CPU Register is small storage available as part of CPU
- * CPU Register is temporary storage in CPU
- * Fastest memory in computer
- * Registers are continuously used when computer turned on.

DATE
PAGE

Different types of CPU Registers :-

There are several types of registers available in the CPU for different purposes let's discuss each one by one:

- * Accumulator :- This is the most frequently used register used to store data taken from memory.
- * Memory Address Registers :- It holds the address of the location to be accessed from memory.
- * (MDR) Memory Data Registers :- It contains data (Buffer) to be written into or to be read out from the addressed location.
- * General purpose Registers :- These are numbered as R0, R1, R2 - Rn-1 and used to store temporary data during any ongoing operations.
- * Program Counter (PC) :- PC is used to keep the track of the execution of the program. It contains the memory address of the next instruction to be fetched.



* IR (Instruction Register) :- The IR holds the instruction which is just about to be executed. The instruction from the PC is fetched and stored in IR.

* Stack Pointer (SP) :- The stack PC's Pointer [FIFO] points to the top of the stack, which is a part of the memory used to store function calls and other operations.

* Flag Register :- It is also known as a status register or condition code register, is a special type of register in a computer's central processing unit (CPU) used to indicate the status of the CPU or the outcome of various operations such as Zero flag, Carry flag, Sign flag etc.

* Condition code register :- contain different flags that indicate the status of any operations.

Size of CPU Register :-

Let's discuss the different sizes of the registers available in the CPU :-

* 8-bit Registers :- These can store 8 bits of data, which is the same as 1 byte.

- * 16-bit registers :- These hold 16 bits of data, or 2 bytes.
- * 32-bit registers :- These can store 32 bits of data or 4 bytes.
- * 64-bit registers :- These hold 64 bits of data or 8 bytes.

Purpose of Registers :-

- * Storing Instruction
- * Holding Answer
- * Quick Access to important stuff.

Bus Architecture :- Bus Architecture is the design of a computer's integrated circuit that allows different components to communicate with each other.

Buses are made up of electrical pathways that carry data, addresses, and control signals between components.

"Bus Architecture refers to the design and structure of the communication system used to transfer data and control signals between different components of a computer system."

