UNIT-01

BASIC STRUCTURE OF COMPUTERS

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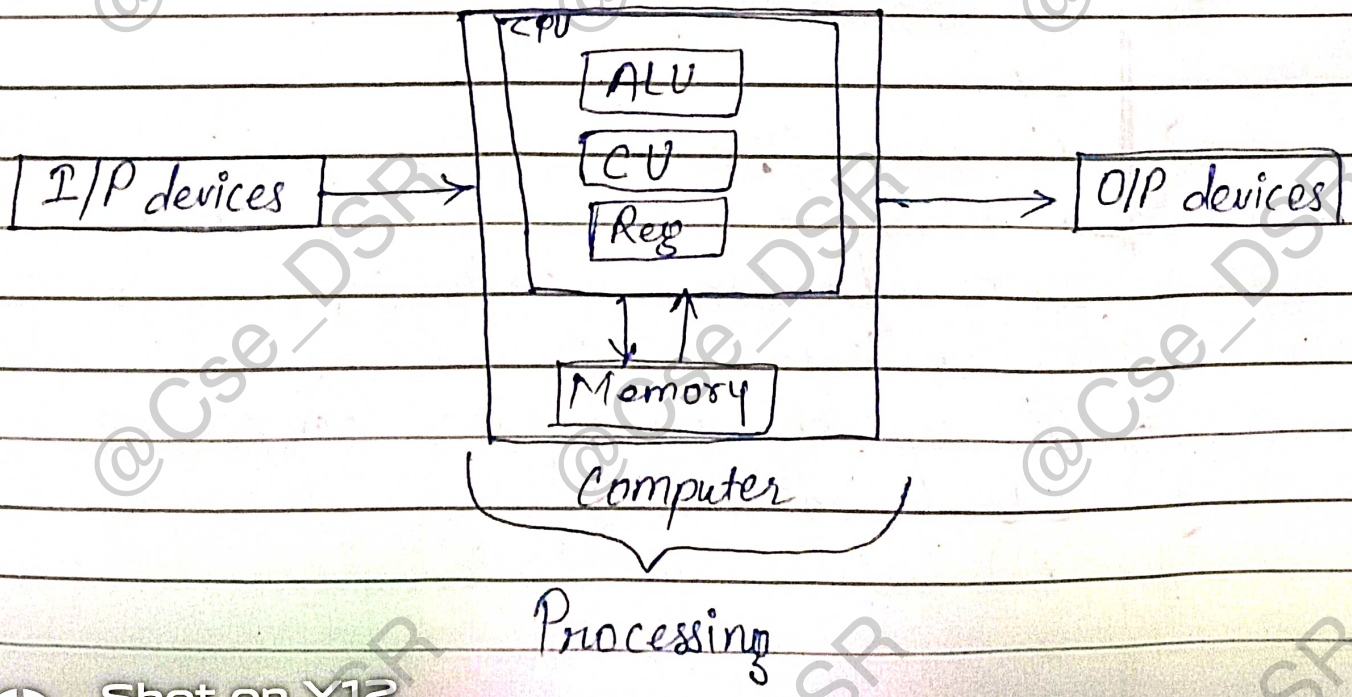
* Computer Architecture :—

↳ Computer architecture always come before computer organisation.
↳ C.A. is functional description of requirement and design implementation for various parts of computer.
↳ It deals with functional behaviour of computer.
↳ It describes what computer does.

* Computer Organisation :—

↳ It comes after computer architecture.
↳ It decribes how the components are connects.
It deals with structural relationships.
It also deals with how computer perform the task.

* Basic structure of Computer On Von-Neumann Arch.



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→ Von-Neumann Architecture is designed by a mathematician and physicst John Von-Neumann in '1945'.

→ It is a designed digital computer architecture.

→ It's design is based on "stored program" computer".

→ "Stored Program" means data and instructions both are stored in same memory space.

→ It consists input devices, output devices, CPU, buses, registors, memory.

* Input devices :- Input devices are the devices which are used to give input to the computer system.

* Output devices :- Output devices are the devices which are used to see the output of the computer.

* CPU :-

→ Central Processing Unit.

→ CPU is an electric circuit which is responsible for execution of program or instructions.

→ It consists mainly two components :-

i) CU (Control Unit)

ii) ALU (Arithmatic Logic Unit)

Arithmatic — add, sub, mul, div, etc.
Logic — AND, OR, NOT, NAND, ... etc.

* ALU :—
↳ It stands for Arithmatic Logic Unit.
↳ It is responsible to perform all the arithmatic and logical operations.

* CU :—
↳ It stands for Control Unit.
↳ It controls all the operations of computer.

* Buses :— Bus is a medium by which the informations are shared between the components of computer of between the computer.

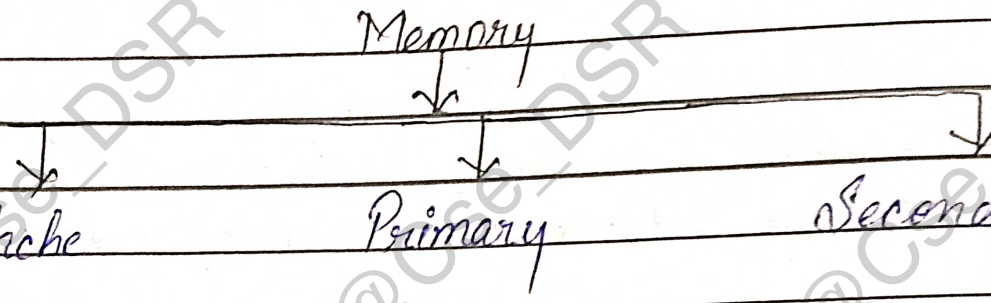
There are three types of bus :—
i) Data bus
ii) Address bus
iii) Control bus

* Data Bus :— Data bus is a bi-directional bus. It carries data b/w the processor and other components or devices.

* Address Bus :— Address bus is an uni-directional bus. It carries "address" from processor to other devices.

* Control bus :- It is also uni-directional bus. It carries control signal from processor to other devices or components.

* Memory :- Memory is a space in computer where we store different data and instructions.



* Cache memory :-

↳ It is the fastest memory of computer system because it provides high speed transfer of data.
↳ It is a temporary memory.
↳ It has very small space that means it has less capacity.
↳ It is very expensive memory.
↳ It has very less access time.
↳ It is a volatile memory.

* Primary memory :-

↳ It is also called main memory.
↳ It is also volatile memory.

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- It is responsible for execution.
- It stores working data.
- It is faster than secondary memory, it means its access time is less than secondary memory.
- It is slower than cache memory.
- Programs can not be executed or run without this.

* Secondary memory :-

- It is also called hard disk.
- It is non-volatile memory.
- It is also permanent memory.
- It's access time is more that's why it is slower.
- It is used for backup.

* Register :-

- Register is a high speed storage area.
- It is available in the CPU.
- i) MAR (Memory Address Register)
  ii) MDR (Memory Data Register)
  iii) ACC (Accumulator)
  iv) PC (Program Counter)
  v) TR (Temporary Register)
  vi) IR (Instruction Register)
  vii) OUTR (O/P Register)

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viii) INPR (I/P Register)

i) MAR :- This register is used to store the address.

ii) MDR :- Used to store the data.

iii) ACC :- Used to store intermediate arithmatic and logic data.

iv) PC :- Used to store the address of next instruction to be executed.

v) TR :- Used to store temporary data.

vi) IR :- Used to store the instructions of comp-

vii) OUTR :- Used to store output data.

viii) INPR :- Used to store input data.

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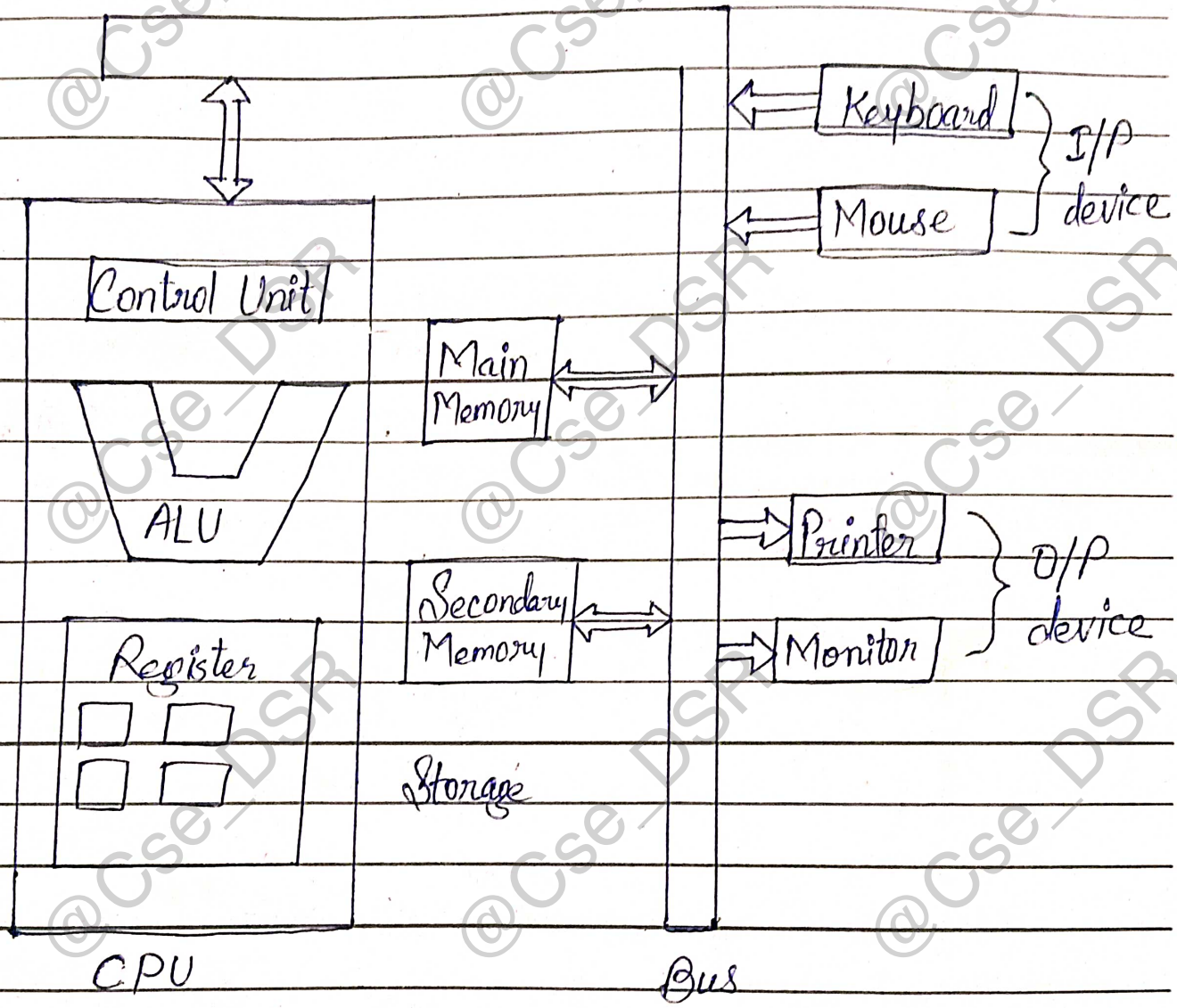
Other figure for Von-Neumann Architecture.



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