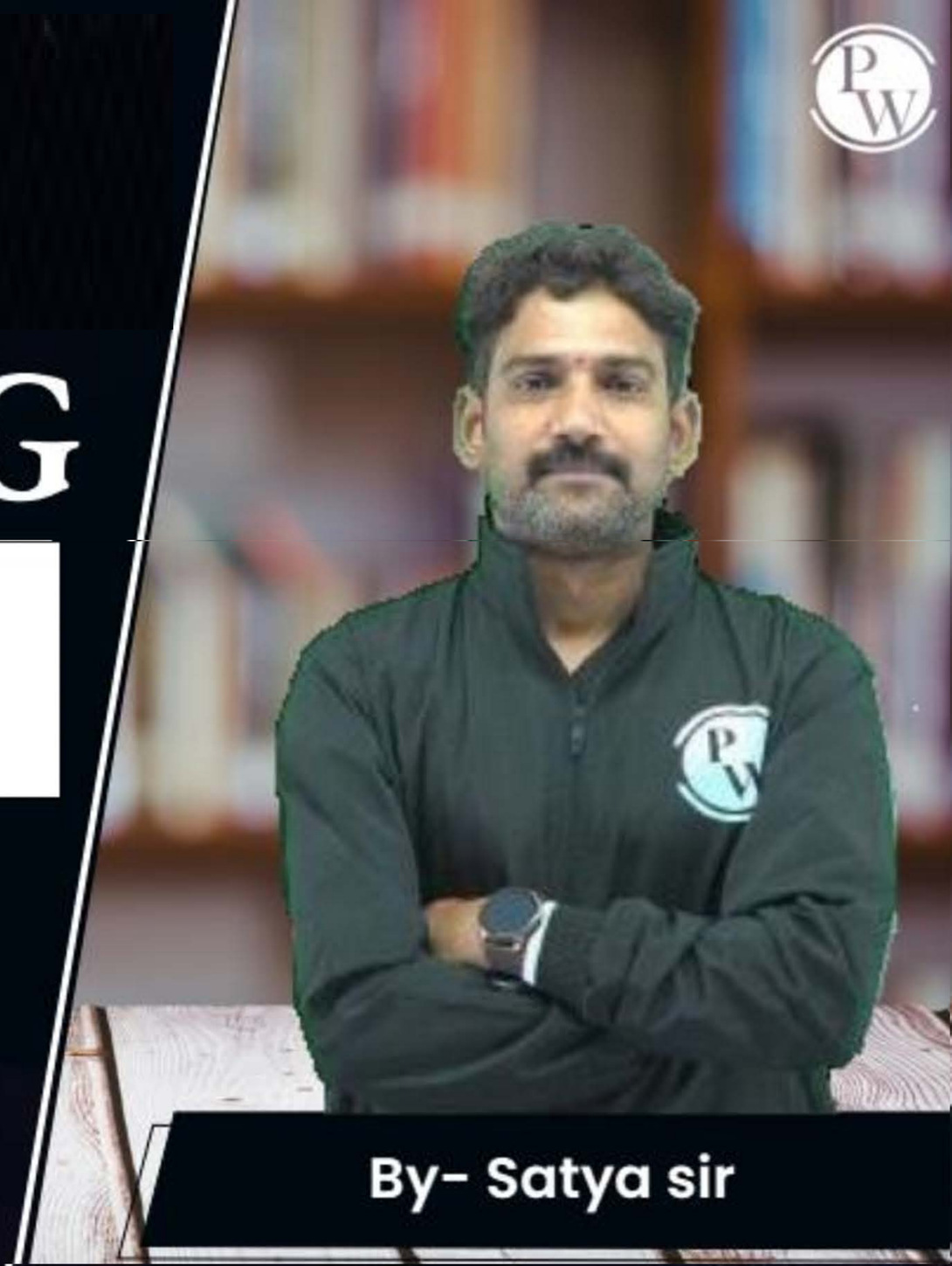
CS & IT ENGINEERING

C-Programming

C Programming Fundamentals

Lecture No.- 01



By- Satya sir

Topics to be Covered

Topic Computer Fundamentals

- Basics of Computer
- bits, Bytes
- Registers

1. Current Academic Qualification

a) B.E/B.Tech 4th Year

b) 3rd Year

c) 2nd Year

d) 1st Year

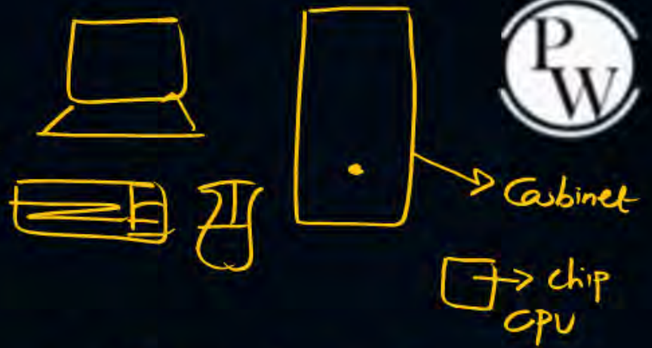
Computer ?

ON | High low | OFF

- It is an Electronic device [Works with only 2 Voltage levels of Power/Current]

- It takes/accepts Input
- Process the Input [Perform Task assigned by User]
- Store results
- Produces output Results.

- Computer is the Combination of Hardware and Software



- Hardware = Physical Component

- input/output Devices
  - input Devices : Keyboard, Mouse, Light Pen, Light Pad, Joystick, Web Camera, Scanner
  - output Device : Monitor / Display Device, Printer, Speakers, Plotters
- Peripherals
  - which helps for Computer functionality

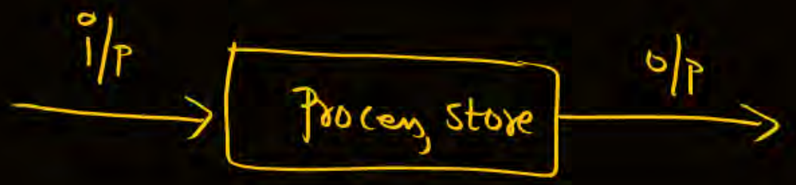
Ex: Cabinet (or) System Case, Mother board, SMPS, Cooling fan, AGP (Graphics) Card, Memory Device, CPU

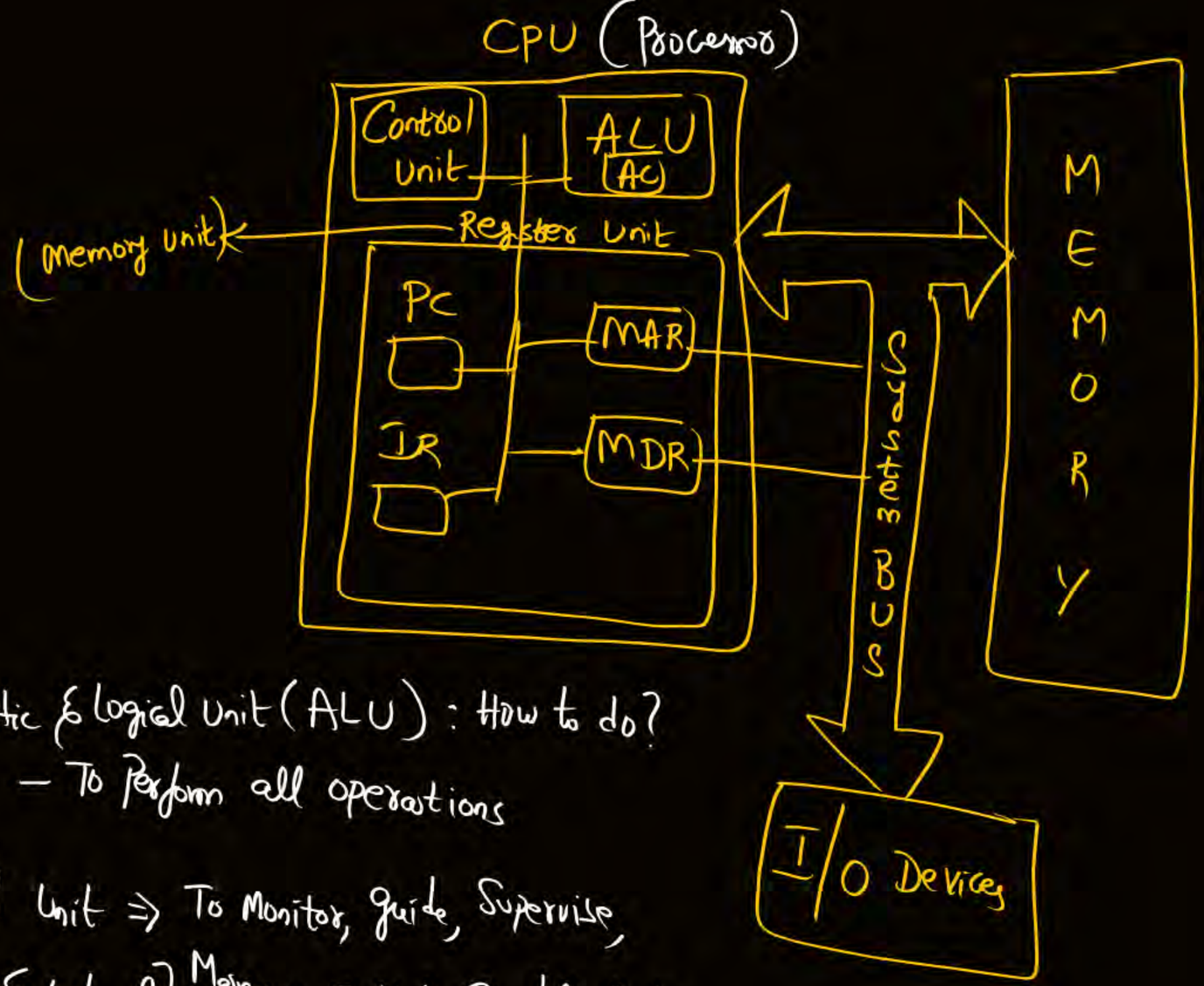
Software : Logical entity

- Developed Using a Programming Language [C, C++, Java, Python, PHP, PERL, RUBY, R - - -]

Basic Functional Units of Computer

a) Input Devices
b) Output Devices
c) Memory
d) CPU (Central Processing Unit)





Register : Group of flip-flops

(D-)flip-flop : Memory Device that holds 1 bit of information.

8-bit Processor ⇒ 1 Register = 8 bits

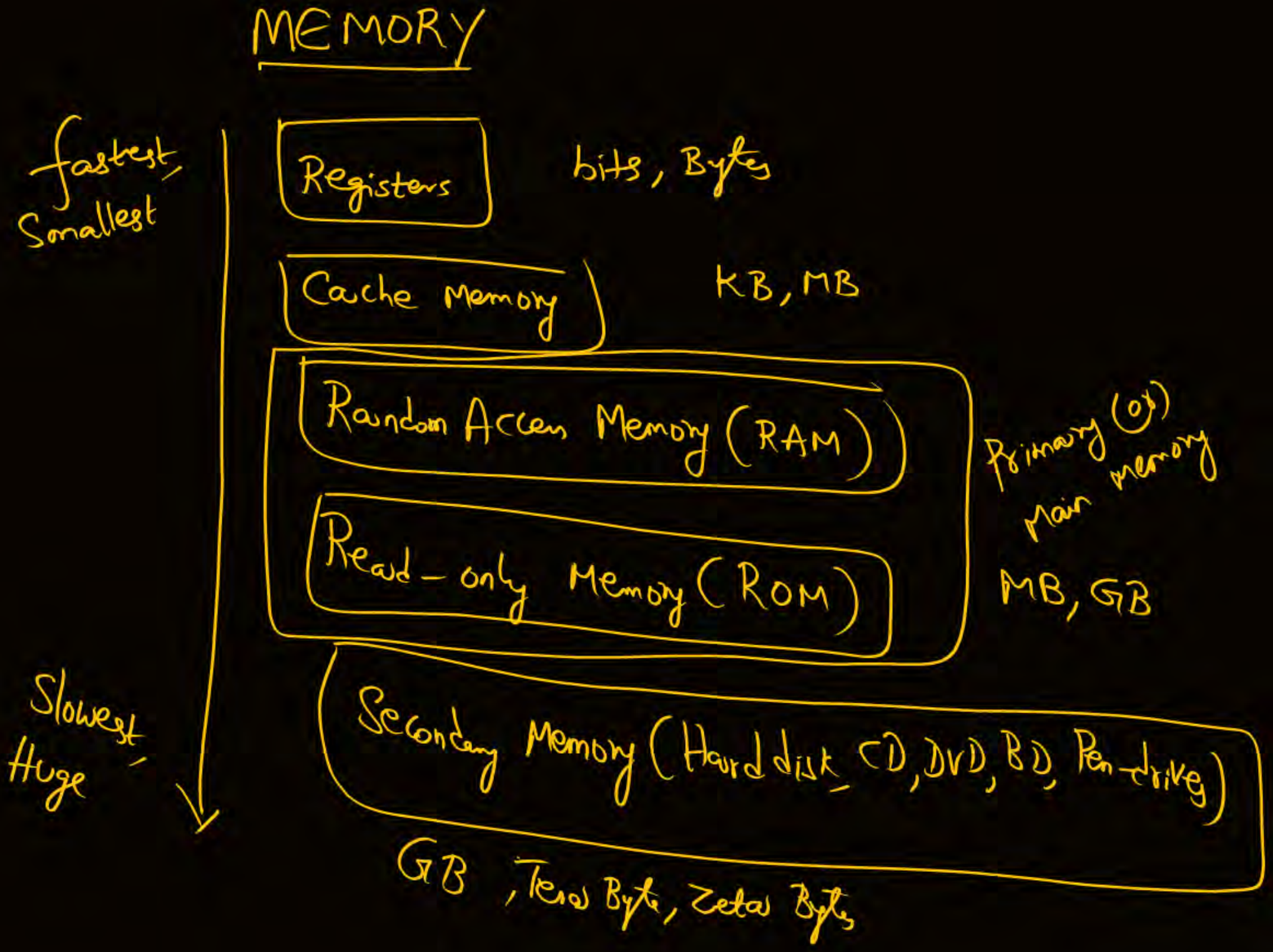
16-bit Processor ⇒ = 16 bits

32-bit " = 32 bits

64-bit " = 64 bits

- Arithmetic & Logical Unit (ALU) : How to do?
  - To Perform all operations
- Control Unit ⇒ To Monitor, Guide, Supervise, Manage, Control Complete System
  [What & When?] [To decide the sequence of operations]

Registers
- General Purpose Registers (GPRs)
- Special Purpose Registers (SPRs)
  - Accumulator ⇒ ALU's dedicated register, (rough Pad/ scratch Pad)
  - Program Counter ⇒ Addres of Next Instruction to be Executed
  - Instruction Register ⇒ Store Currently Executing Instruction.
  - Memory Address Register ⇒ Address of data required for Execution
  - Memory Data Register ⇒ Data for Current Inst- Execution


MEMORY
fastest
Smallest
Registers
bits, Bytes
Cache Memory
KB, MB
Random Access Memory (RAM)
Read-only Memory (ROM)
Primary (or) Main memory
MB, GB
Slowest
Huge
Secondary Memory (Hard disk, CD, DVD, BD, Pen-drive)
GB, Tera Byte, Zeta Byte

1 bit = 1 bit [0/1]

4 bits = 1 Nibble

8 bits = 1 Byte

2^{10} B = 1024 Bytes = 1 Kilo Byte (1 KB)

2^{10} KB = 1024 KB = 1 Mega Byte (1 MB)

2^{10} MB = 1024 MB = 1 Giga Byte (1 GB)

2^{10} GB = 1024 GB = 1 Tera Byte (1 TB)

2^{10} TB = 1024 TB = 1 Peta Byte (1 PB)

2^{10} PB = 1024 PB = 1 Zeta Byte (1 ZB)

$2^{10} = 1024$

Q) 8 MB = _____ Bytes

a) 2^{13} b) 2^{20} c) 2^{23} d) 2^{26}

$= 8 * 2^{10}$ KB

$= 8 * 2^{10} * 2^{10}$ Bytes

$= 2^3 * 2^{10} * 2^{10}$ Bytes

$= 2^{23}$ Bytes

Q) 16 GB = _____ bits

$= 16 * 2^{10}$ MB

$= 16 * 2^{10} * 2^{10}$ KB

$= 16 * 2^{10} * 2^{10} * 2^{10}$ Bytes

$= 16 * 2^{10} * 2^{10} * 2^{10} * 8$ bits

$= 2^4 \times 2^{10} \times 2^{10} \times 2^{10} \times 2^3$ bits

$= 2^{4+10+10+10+3}$

$= 2^{37}$ bits

Q) 2^{41} bits = _____ GB

2^{41} bits $= 2^{38} * 2^3$ bits

$= 2^{38} *$ Bytes

$= 2^{30} * 2^8$ Bytes

$= 256 * 2^{30}$ Bytes

$= 256$ GB

1 GB = 2^{10} MB

$= 2^{10} * 2^{10}$ KB

$= 2^{10} * 2^{10} * 2^{10}$ B

$= 2^{30}$ Bytes

**

1 KB = 2^{10} Bytes

1 MB = 2^{20} B

1 GB = 2^{30} B

1 TB = 2^{40} B

2 mins Summary

Topic One ⇒ Computer Introduction

Topic Two ⇒ Functional Units

Topic Three ⇒ Registers, Types, Purpose

Topic Four ⇒ bits, Bytes

Topic Five ⇒ Forms of memory hierarchy

THANK - YOU