DATE
PAGE

Computer Programming (CS1210)

Text & Ref books:

1. C: The complete reference TMH
2. The C Programming Langug by Kernishan Ritchie, PHI (in lab)
3. Let us C Yashavant Kantbar } BPB
4. C in depth by SK Srivastav
5. Computer Fundamental & Programming, SDey, TMH

Why C!

Problem Solving skill
Critical thinking

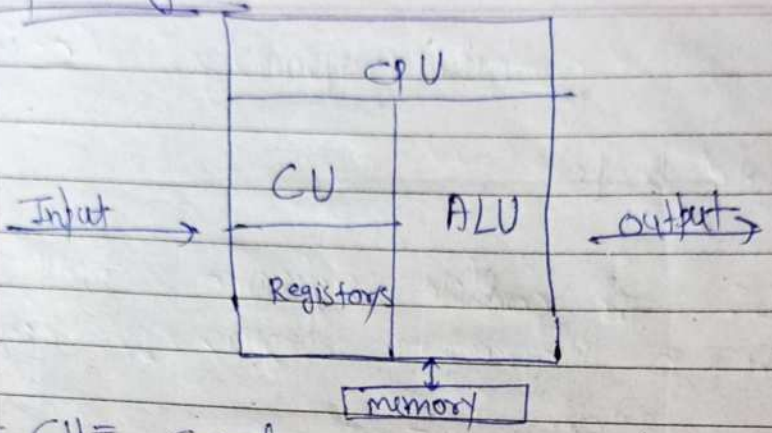
chap-1

Basics:-

★ Computer:- An electronic device which is under the control of set of instructions which are given by the programme and software to
(a) process the data or manipulate the data or
(b) to store the data
(c) to manipulate the data
(d) to retrieve the data

A architecture = Von Neumann

Components of CPU



these are the parts of the CPU
- CU = Control unit
- ALU = Ar- - Log - unit
- Registors

☆ ALU :- perform all arithmatic & logical operation (+, -, *, /)
(or, and, XOR, not e

Transistors
☆ ~~Registors~~ :-
☆ for logical oper^n we use gates
since circuits are made of gates Transis
and gates are made by ~~registors~~

☆ CU :- manage all hardware by sending Controlled and timing signals with the help of some clock pulse

eg 2.4 GHz clock pulse means
⇒ 2.4×10^9 Instruc^n / sec

DATE
PAGE

(just like 32 bits)

☆ Registors: They are temporary storage device (RAM)

size of registors depend on size of architecture like 32 bits
64 bits
16 bits

Eg: 64 bit arch. means size of registor is 64 bit

Role:- They are tightly attached to ALU & CU so transfer data fast Compared to RAM
They are very fast.

Registors type in next class

☆ Memory → RAM → Static RAM (SRAM)
→ ROM → Dynamic RAM (DRAM)

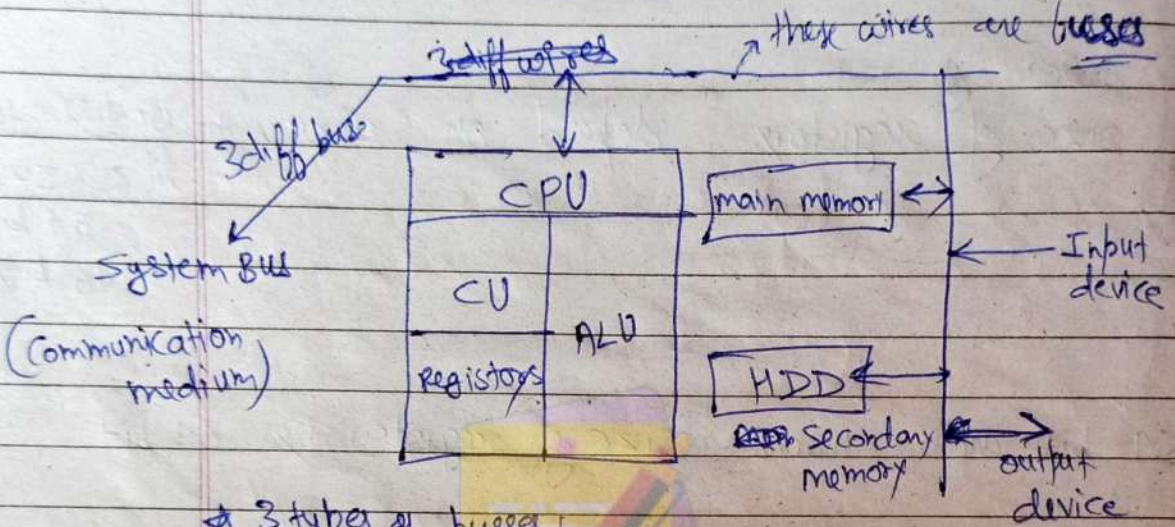
SRAM = with Transistors
DRAM = " Capacitors

SRAM fast than DRAM

so SRAM = Cache memory → 3 types L1, L2, L3 will discuss later
DRAM = actual RAM

DATE
PAGE

Architecture

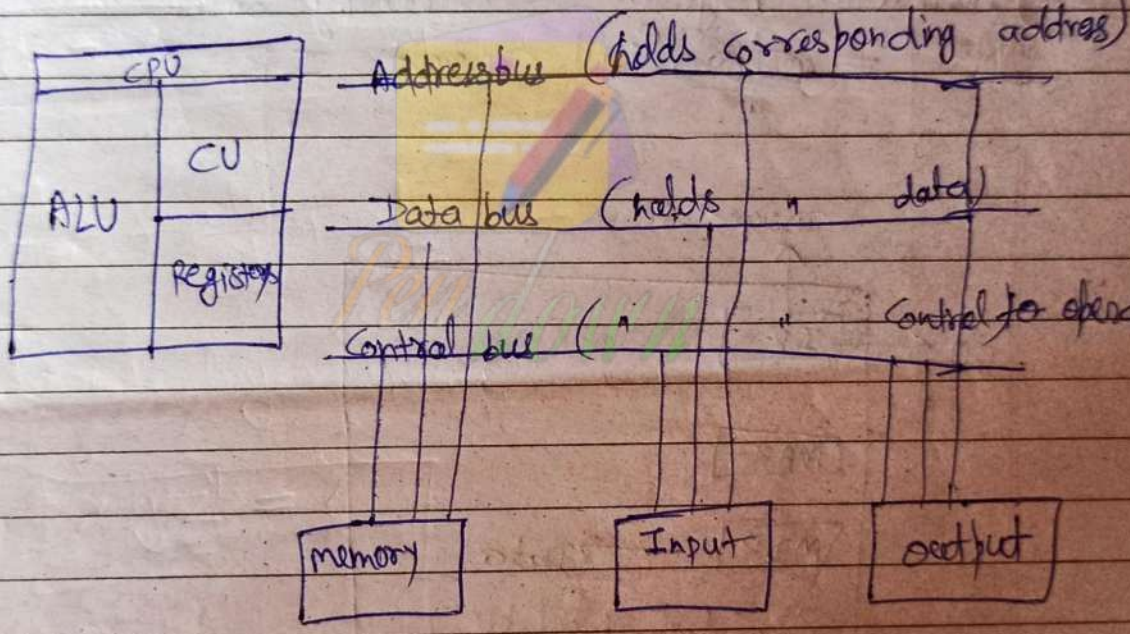


* 3 types of busses :

1. Controlled bus
2. address bus
3. data bus

both soft should be independent.

11-12 Computer Prog (1)



☆ Bus is a communication medium in form of wire
↳ 2 types → (i) Internal → in CPU
(ii) External → other all

☆ Register is made of IFF = 1 bit
64 bits

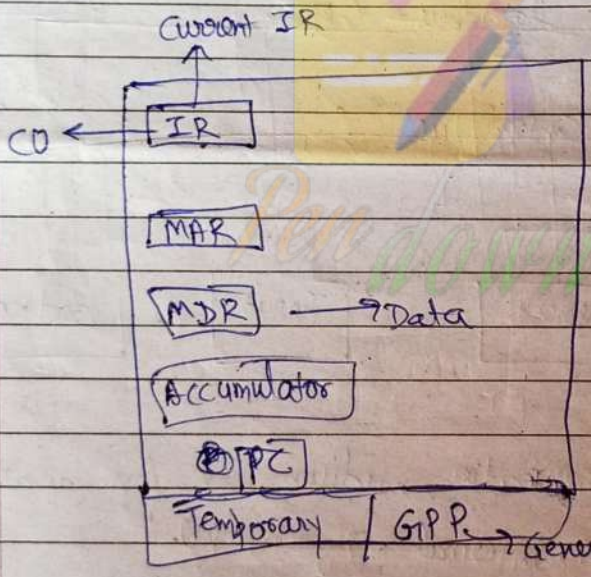
DATE
PAGE

★ C = (A+B)

A = 2
B = 3

some types of registers

(IR) Instruction register = Control by control unit
= store all current IR



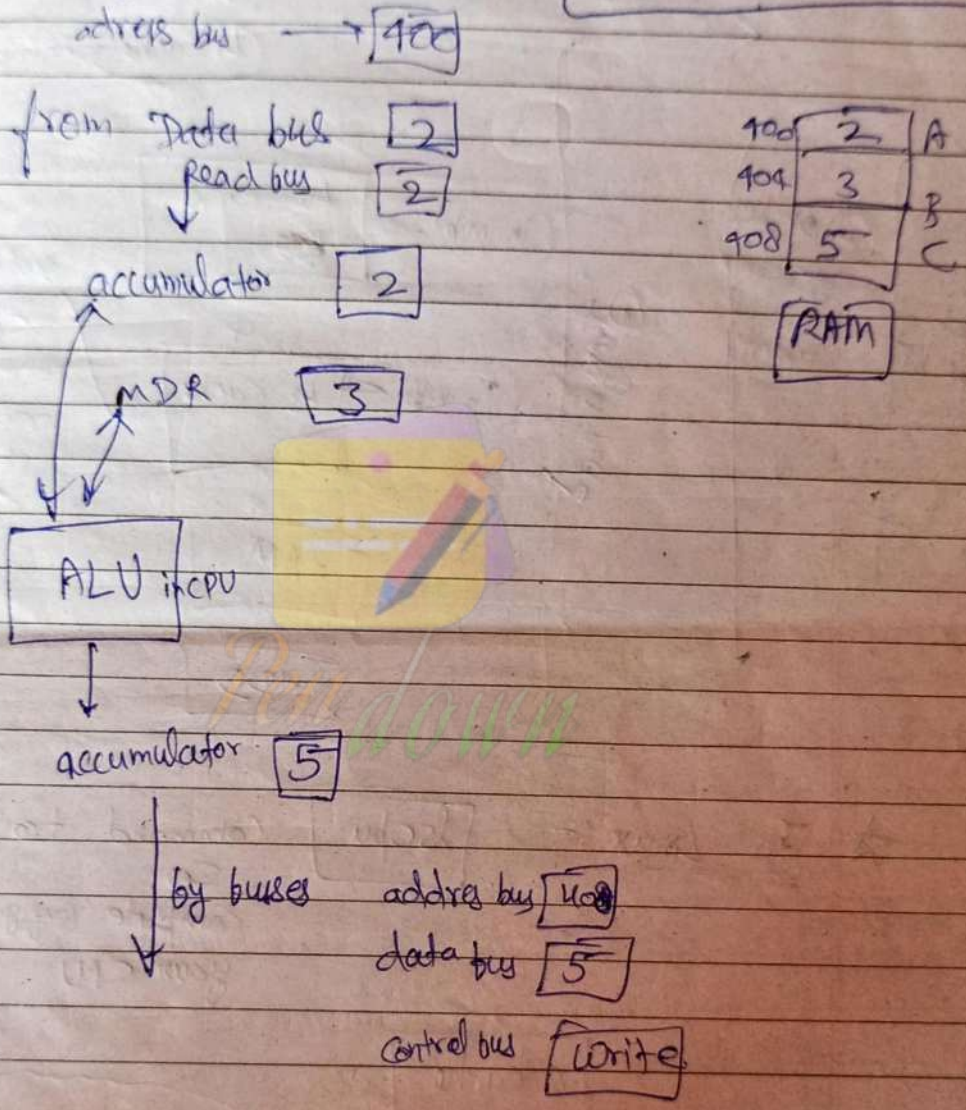
MAR = memory address register
MDR = " data "

ACC → take data from Ram & to MDR
also store Data & result.

PC → Programme Counter → record all instruction & store address for next instructions.
makes instructions to be fetched from memory.

DATE
PAGE

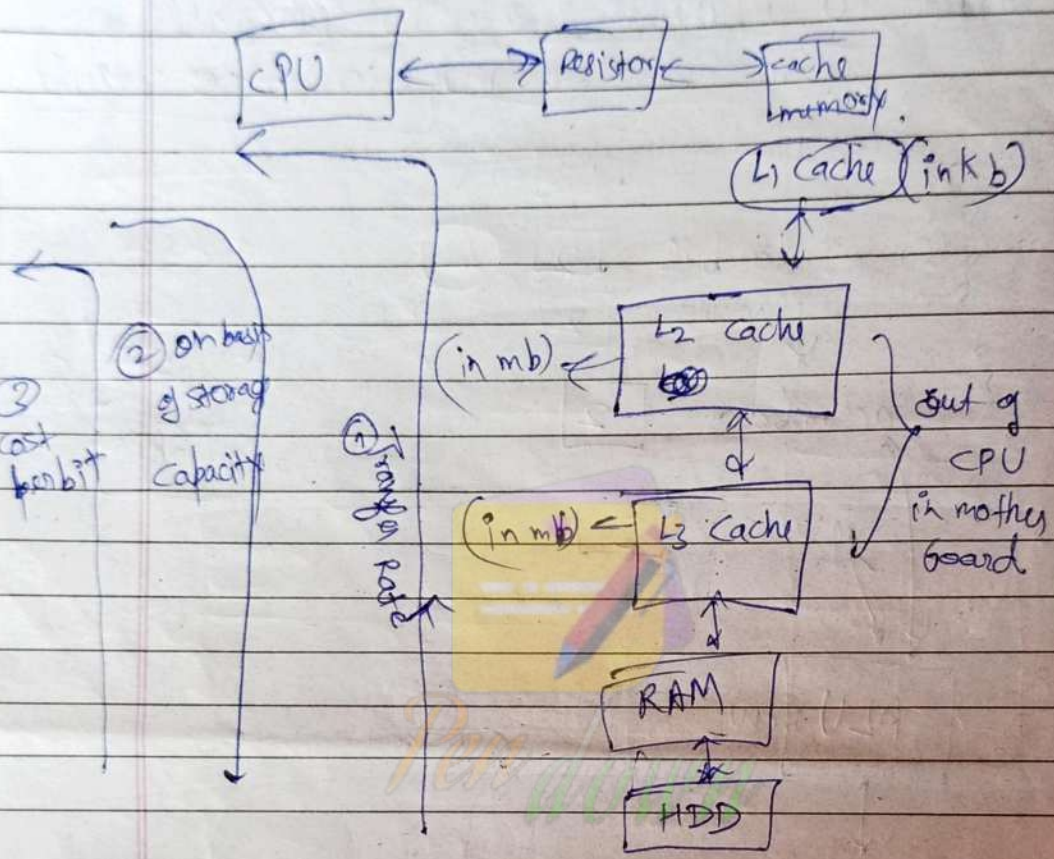
☆ GPP = 16 different → To store all intermediate result
(ram & data buses in)



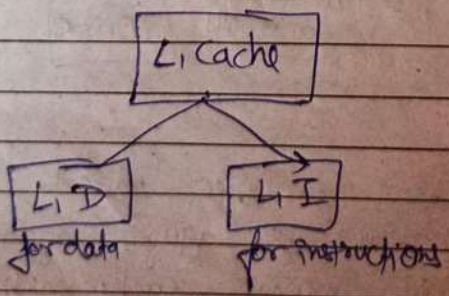
☆ Size of resistors is quite limited. So we have to reuse some instruments again & again
So we store special memory = Cache memory.
instructions in

l_1 cache → CPU
l_2, l_3 cache → motherboard

(1) In order of speed of data transfer



☆ In Linux :- lscpu Command to see complete config. of your CPU

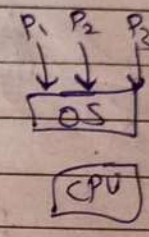


11 June — Saturday

10 Ram — CS-1

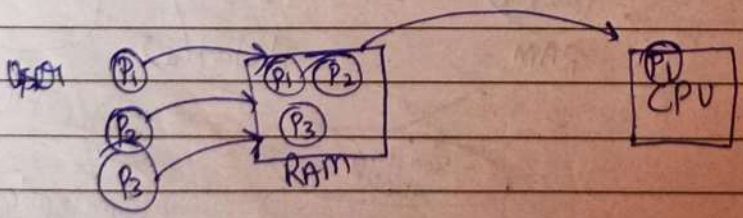
Function of operating system –

1. Process management / CPU management
2. Memory management (manages RAM)
3. Storage management (HDD) or file management
4. I/O device management
5. Communication services. (Internet, LAN etc)
6. Protection & Security



multiprogramming OS and multitasking OS :-

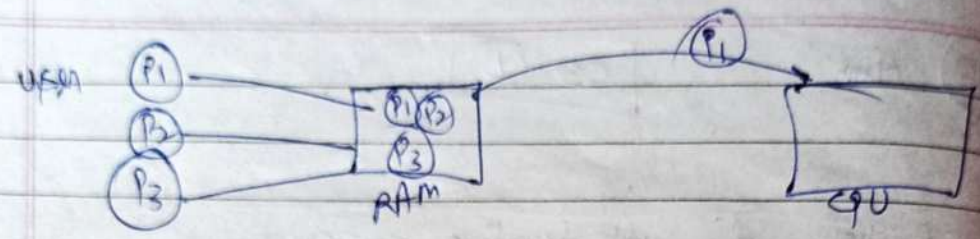
(Time sharing OS) or (Round Robin approach)



P_1 → succesfully completed
P_1 → terminate
P_1 → I/O operation.

allocate process P_1 first than P_2 than P_3 till completion of P_1, P_2 & ...

Multiprogramming



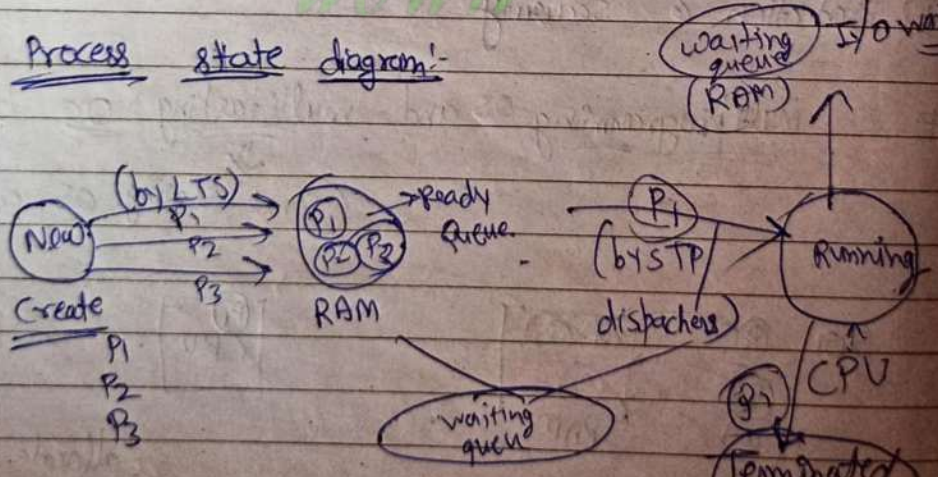
Multitasking

* sets a time slot : 3ms (say)

let P1 execution time 6ms

& will have 3ms then O-S will execute 3ms & put remain in ram & execute P2 now and so on.

Process state diagram:-



LTS = Long Term Scheduler
STS = Short "

19 June Tuesday

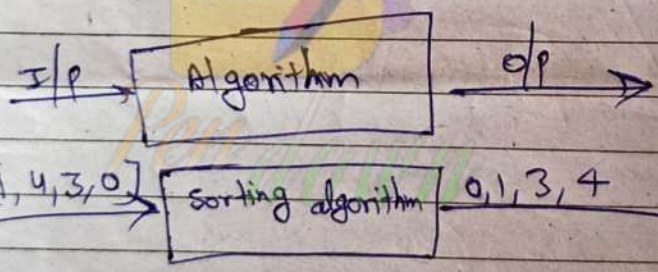
10-11

A CS-1

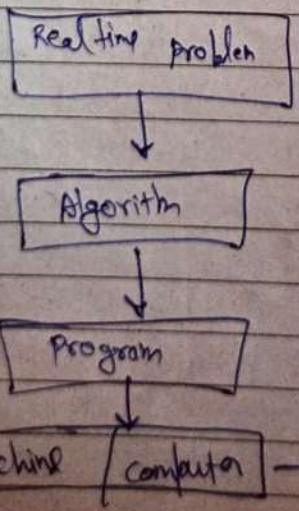
Algorithm ⇒ step by step sol^n of any problem

steps must be computational logic

⇒ Sequence of finite well defined computational steps which takes value/set of values as input and produces atleast one output



Eg



DATE
PAGE

* algo is abstraction of programs to be executed on machine

characteristics of algo :-

1. easy to understand
2. Definiteness (There should not ambiguity)
3. finiteness (must be terminated)
4. effectiveness (Time complexity must be as less as possible
   space complexity
   (space complexity must be less)
5. output must be correct
6. variable
7. produce atleast one output

*

Ex: Simple Interest $SI = \frac{P \times R \times t}{100}$

1. start
2. Input P, R, t
3. Compute $SI = \frac{P * R * T}{100}$
4. print SI
5. stop.