



SNS COLLEGE OF TECHNOLOGY

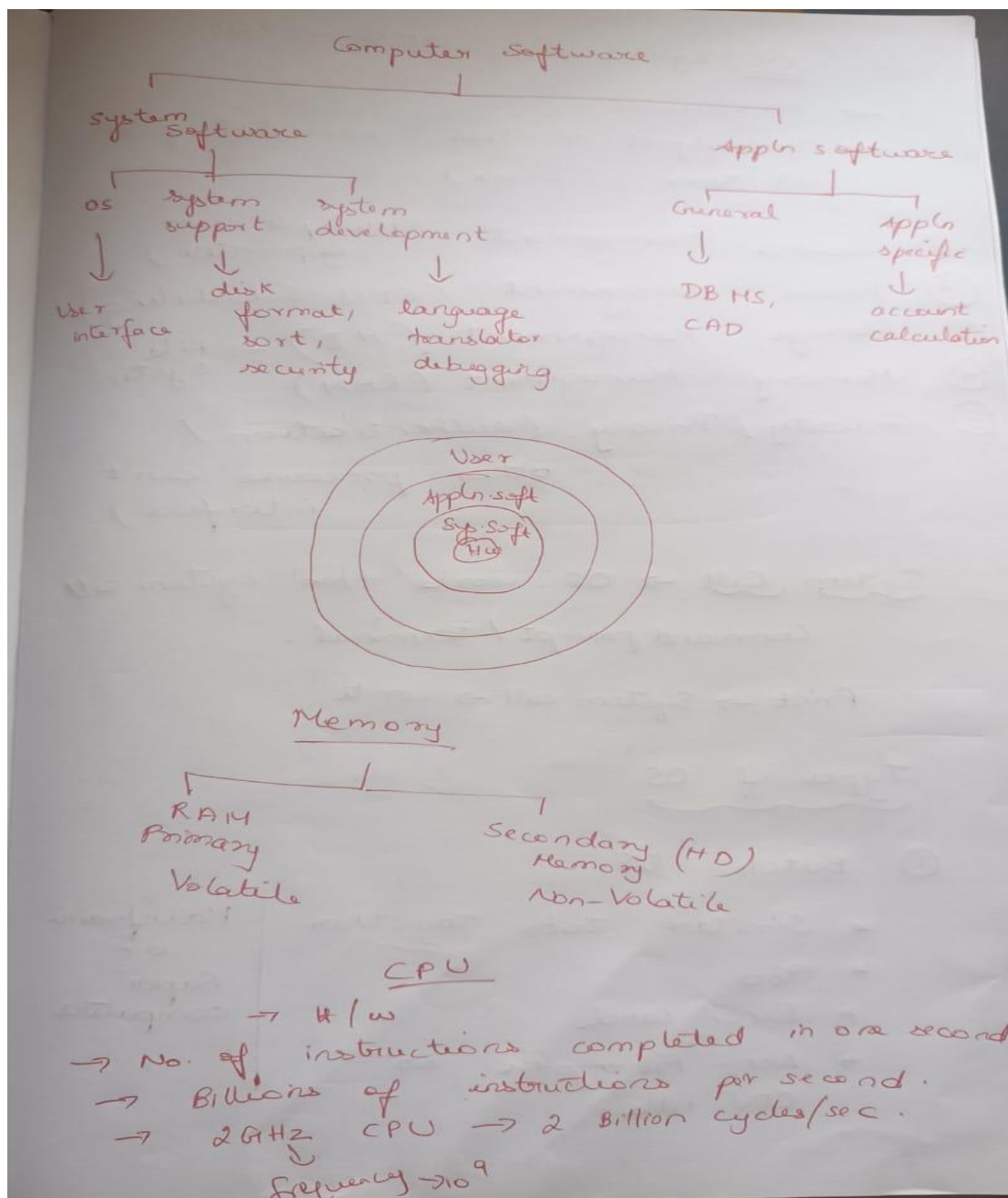
DEPARTMENT OF AIML

23CST202- OPERATING SYSTEMS

II YEAR IV SEM AIML-B

UNIT 1 – OVERVIEW AND PROCESS MANAGEMENT

TOPIC – INTRODUCTION, COMPUTER SYSTEM ORGANIZATION





* OS → One program running at all times on computer also called as kernel.

* Along with kernel → 2 other types of programs

① System Programs → associated with OS but all not part of kernel.

② Appln. Programs → not associated

with operation of system.

* Mobile OS → Core kernel & also

middleware (software frameworks additional service) like database,

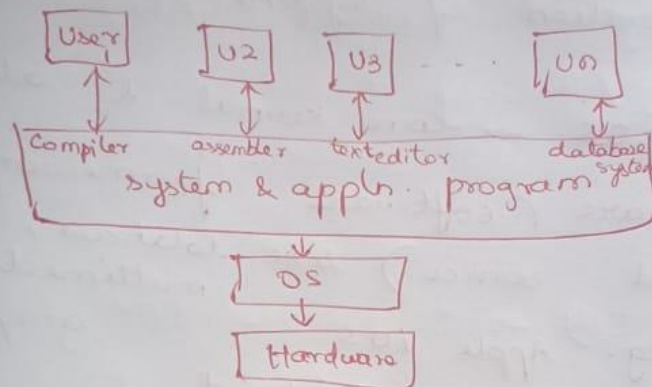
eg. Apple iOS multimedia,

Google's android graphics



Operating systems

- Operating system → Program that manages a computer's hardware.
- * Basis for application programmes
- * Intermediary b/w comp. user & hardware.
- * Must be → convenient
→ efficient



Abstract view of components of Computer system

Hardware → CPU, Memory, I/O devices

Appl. program → Browsers, Word, Compilers

- ① Single User → Easy to use
- ② Mainframe or Mini Computer → Maximize resource utilization
- ③ system View → Resource Allocator
→ Control Program
(manages the execution)



OS Eg. windows 95% → 82%

→ Convenience
→ Throughput → Task executed per unit time. (linux)

- ① Resource Management (Multiple user eg. printer)
- ② Process Management (CPU scheduling)
- ③ Storage Management (H D) → File system
- ④ Memory Management (RAM)
- ⑤ Security / Privacy. (authentication / other processes can't interfere)

System Call → OS works thro' system call
Command prompt / terminal.

Print → System call → write

Types of OS

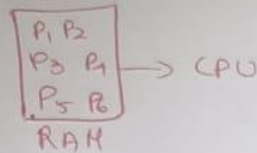
- ① Batch OS
 - * Similar jobs together
 - * 1960
 - * Punch cards
 - * Non-Preemptive so CPU idle.

Mainframe or Super computers



② Multi programmed OS

* Non pre-emptive



* If a process goes to I/O, that time next process can come.

③ Multitasking / Time Sharing OS

* Pre-emptive

* Eg. 2 mins or 2 questions.

* Response time is faster.

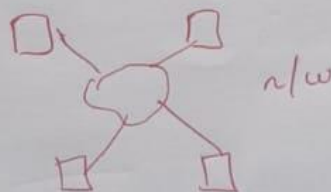
④ Real Time OS



eg. Missile
air traffic

eg. time limited
streaming
online game

⑤ Distributed (Environment) (location)



⑥ Clustered



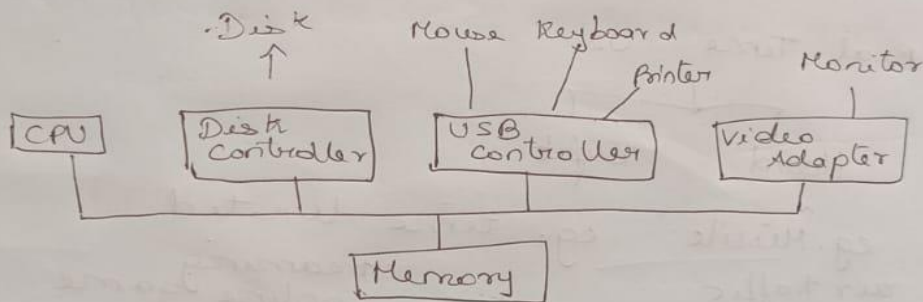


⑦ Embedded
Fixed like washing machine.

Computer system Organization

① Computer system Operation

- * Modern general-purpose computer system consist of one or more CPU
- * no of device controllers connected through common bus
- * Shared memory



- * CPU executes only from main memory (RAM)
- * CPU & device controllers execute concurrently
- * Memory controller is provided



* Bootstrap Program - Initial program that runs when computer is on

- ROM

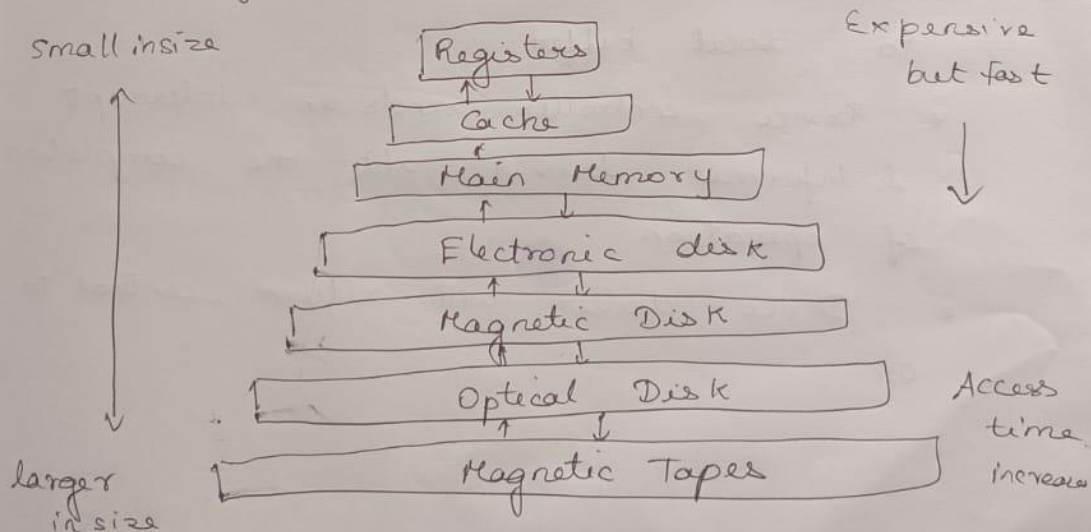
- Load the OS kernel to main memory

* Interrupt - H/w will trigger an interrupt by sending a signal to CPU through system bus

* System call (Monitor call) - s/w may trigger an interrupt by executing a special operation called system call.

Interrupt
↓
CPU → Interrupt Service Routine (ISR)
starting address

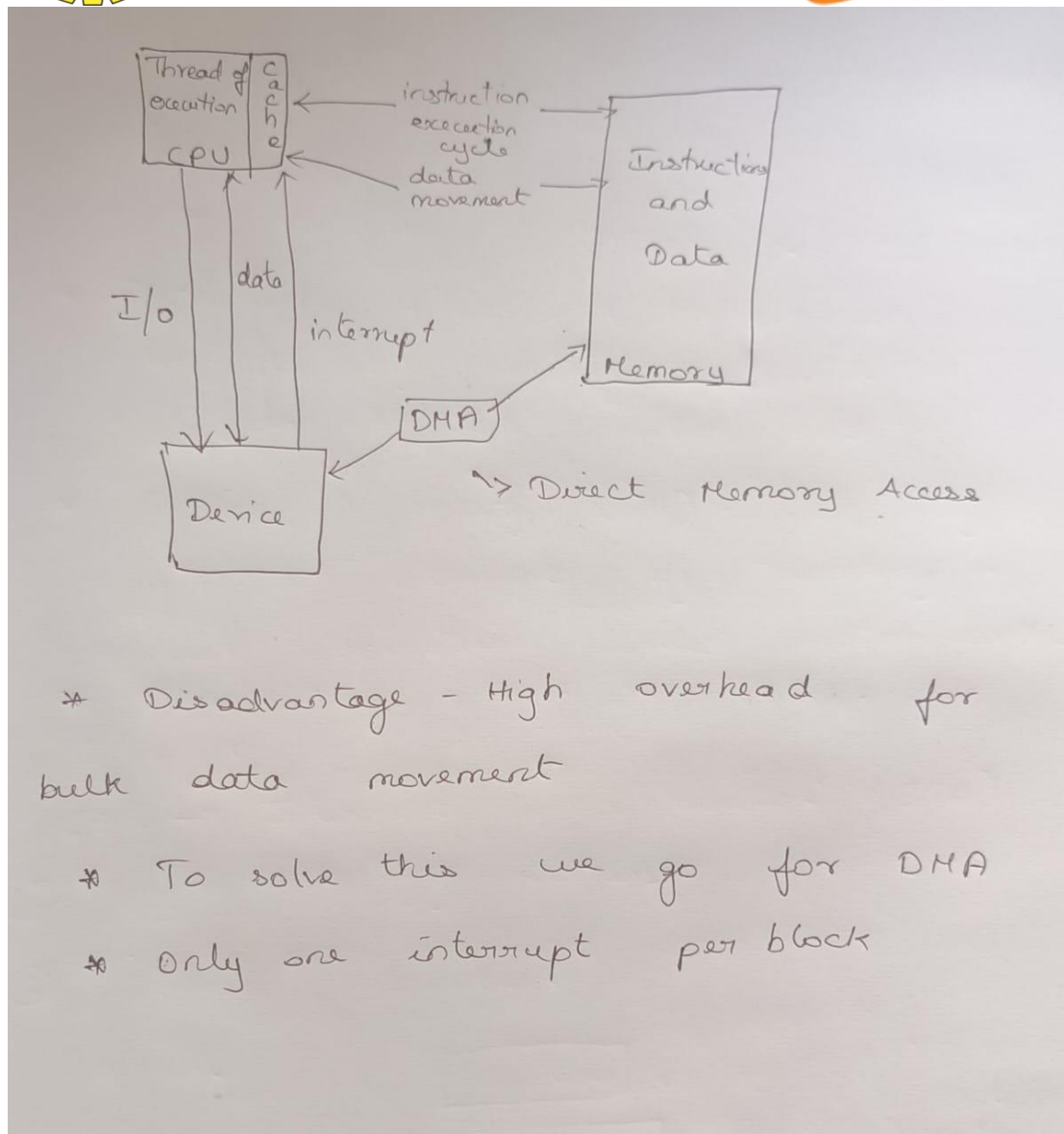
② Storage Structure





③ I/O structure

- * Most OS is dedicated to manage I/O
- * Reliability & performance of system depends on it.
- * Device controller → local buffer storage
→ special purpose registers.
- * Device driver for each device controller, acts as interface to OS.
- * Device driver load the appropriate register
- * Device controller examines & transfers to local buffer
- * Device controller sends an interrupt & informs driver abt. the completion of operation
- * Device driver will return control to OS



* Disadvantage - High overhead for bulk data movement

* To solve this we go for DMA

* Only one interrupt per block