UNIT-V
OS

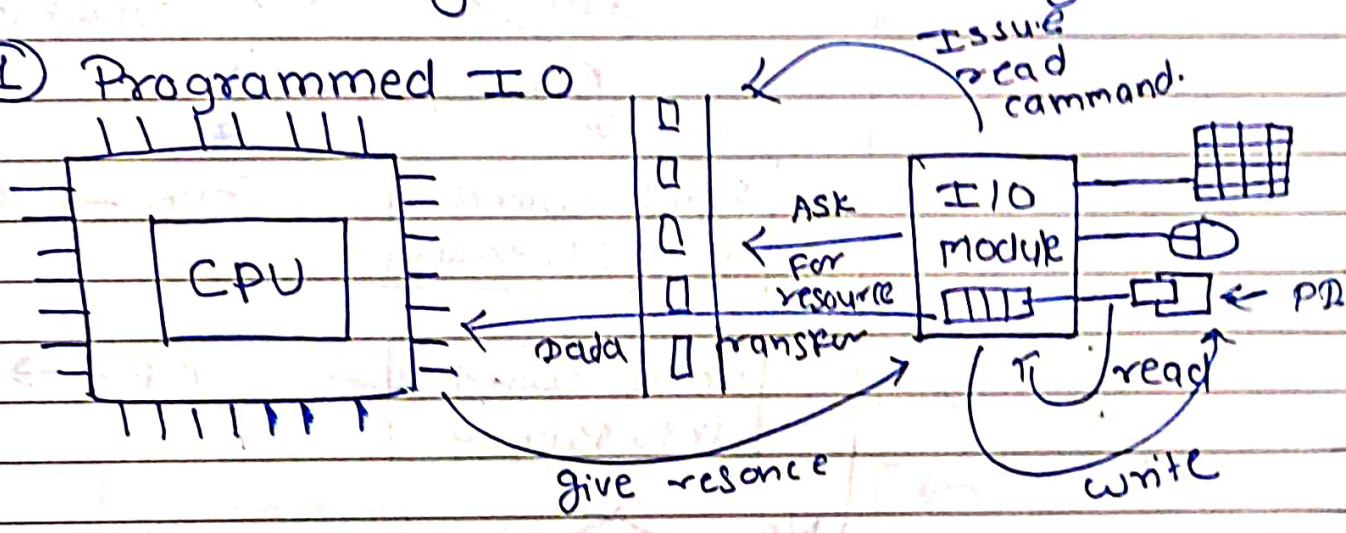
• I/O & File Management •

Q-1- Explain In Breif: I/O Performing Techinques. — 12M

→ Three ways by which I/O is Performed

① Programmed IO
② Interrupt Driven IO
③ IO using DMA. (Direct Memory Access).

① Programmed IO

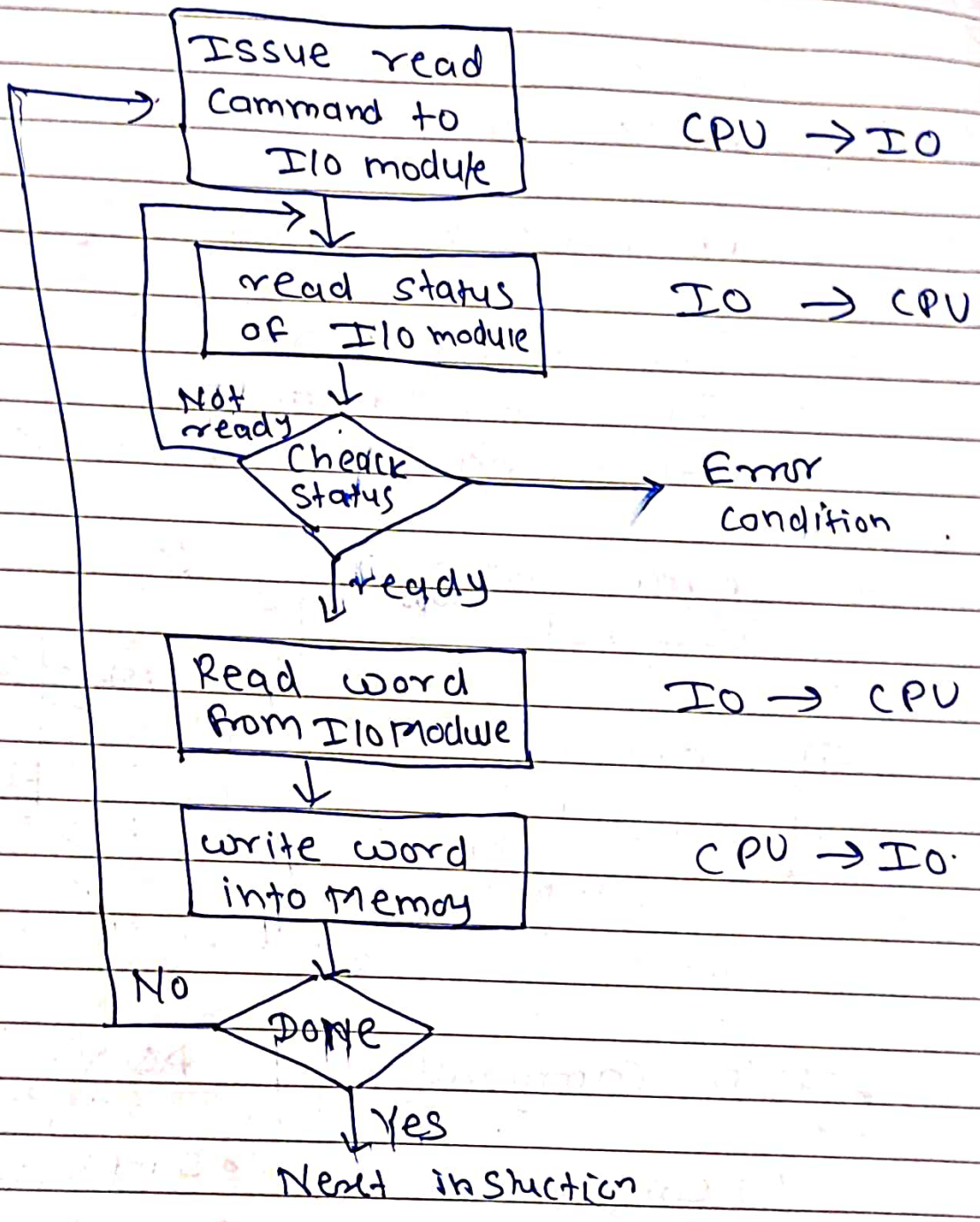


I/O Commands	ADV.
⇒	
① Control	• Simple
② Test	• Read write
③ Read	Dis adv.
④ write	• Time consuming
	• CPU is Idea.

Modes of Addresing

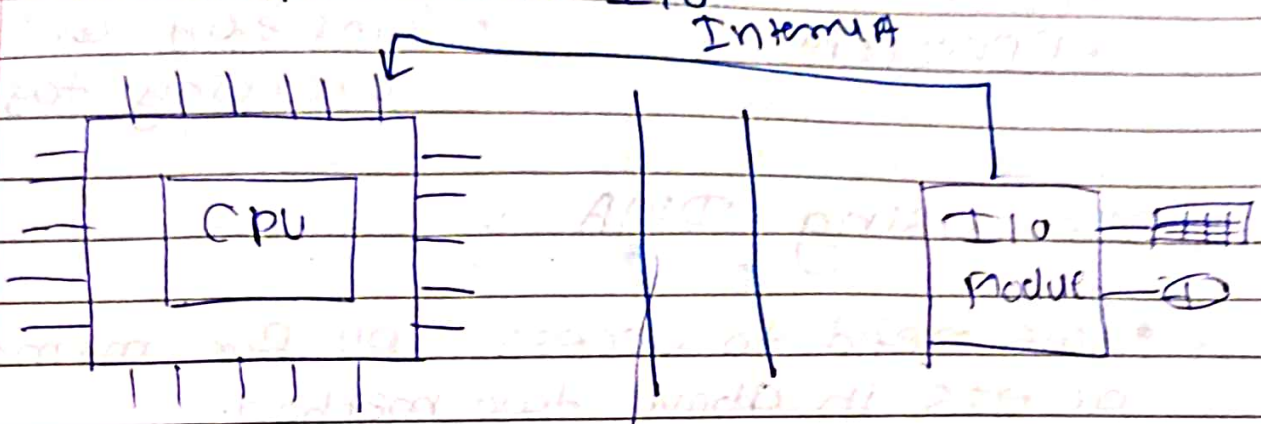
memory mapped I/O	Isolated IO
"Single address space for memoy & IO"	" saparate address space for memoy & IO"

Flow chart



- Limitations
  - Low end microprocessors.
  - Single Input & Single output
  - each instruction select one I/O i.e. trasfer one char at a time.
  - Example
    : Micro process controlled video

(2) Interrupt Driven I/O



Working

Hardware

Device Controller or other system hardware issue interrupt

↓

Processor finish execution of current instruction

↓

Processor signal acknolagment of interrupt

↓

Process pushesh PC onto control stack

↓

processer loads new value based on interrupt

Software

Save reminder of process state

↓

Process Interrupt

↓

restore process state info.

↓

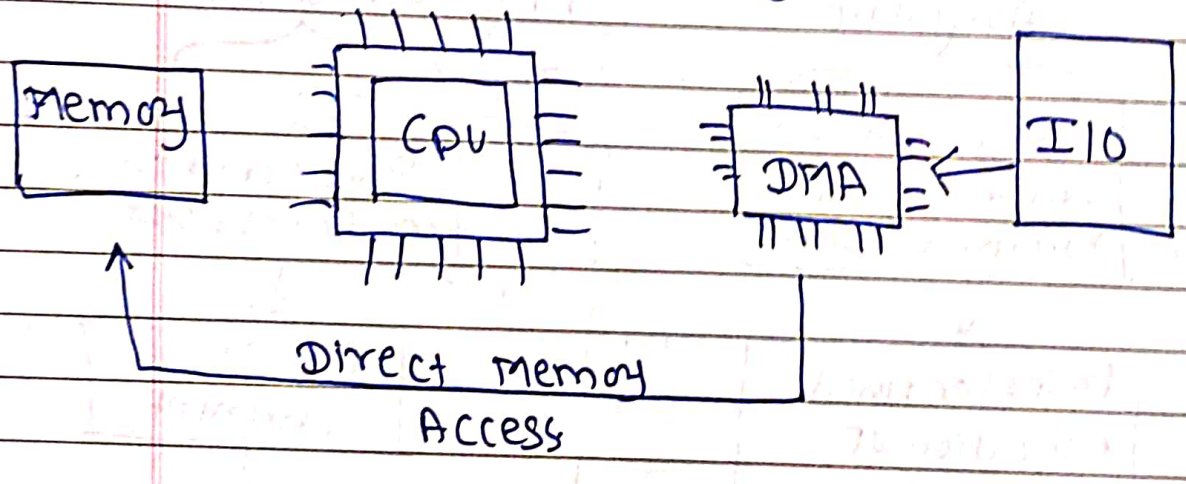
restore old PSW & PC

Adv.
- Fast
- Efficient

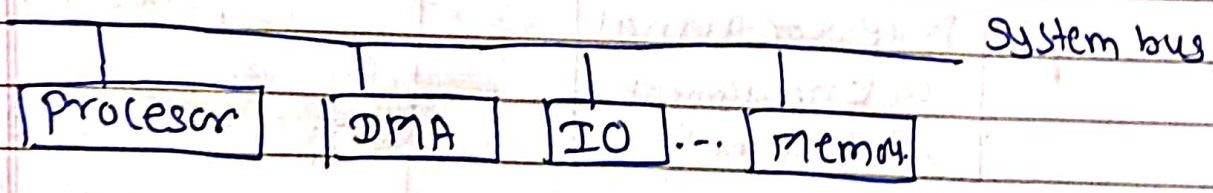
Disadvantage
- Tricky
- Complexity while working togather

③ IO using DMA

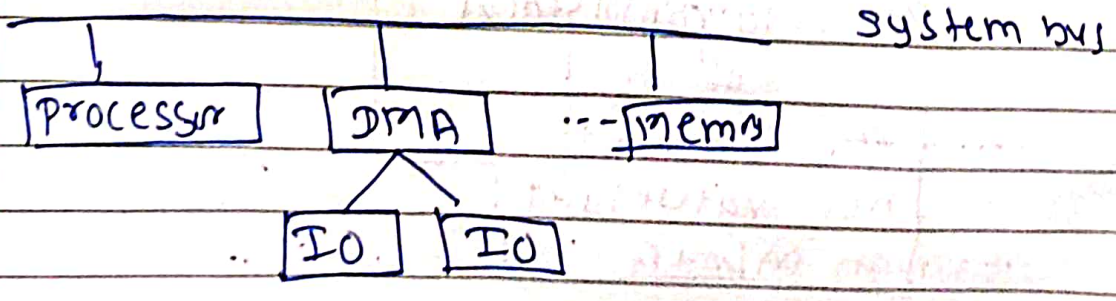
- we need to access CPU for memory access in above two method.
  here we use DMA
  i.e. Direct memory access.



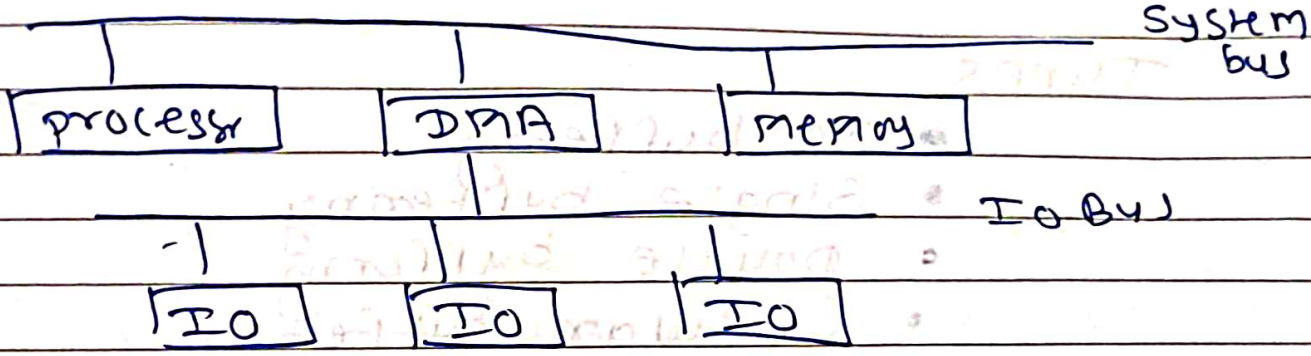
- Single Bus, Detached DMA.



- Single bus, Integrated DMA



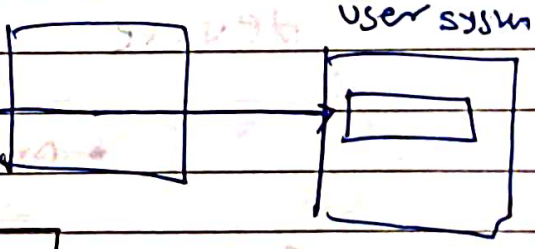
- I/O Bus
  Same as above
  but system bus connected to
  Processor, DMA, mem
  & IO has saprate bus (IO Bus)

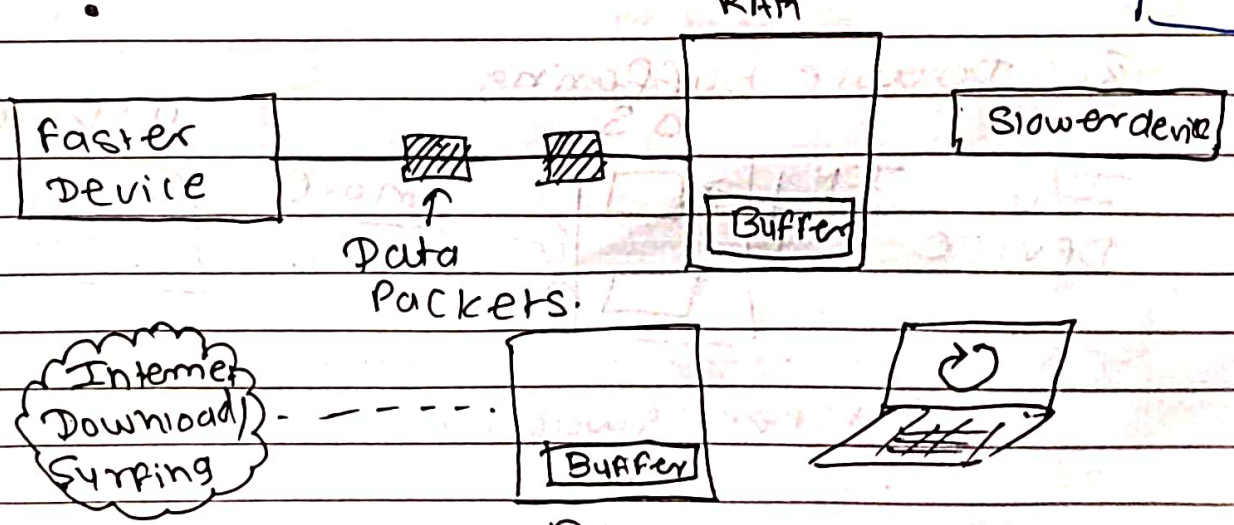


• Transfer mode.	ADV	DISA.
(i) Brust transfer	• Fast	• Expensive
(ii) Cyclic tsteling.	• ease of access	• cache coherence
(iii) Interleaved mod"		

2-2- Explain IO Buffering. a)

→ (i) No buffering — IO device





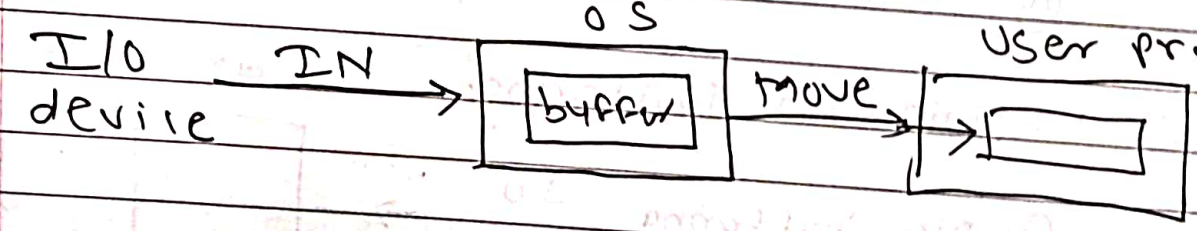
Buffering is a technique by which the Device manager can keep slow I/O Device busy (by transfering Data in advance) during time when a pro is not requiring I/O opradim

Types

- No buffering
- Single buffering
- Double buffering
- Circular buffering.

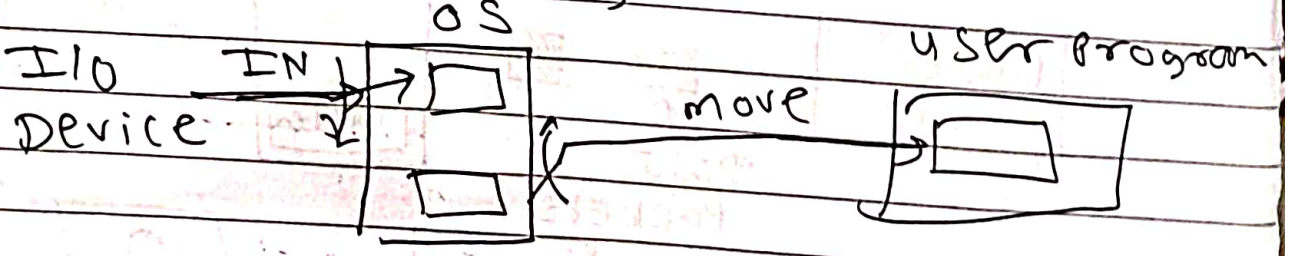
① No buffer
: Without buffer OS directly acces the devile when it needed

② Single buffering.



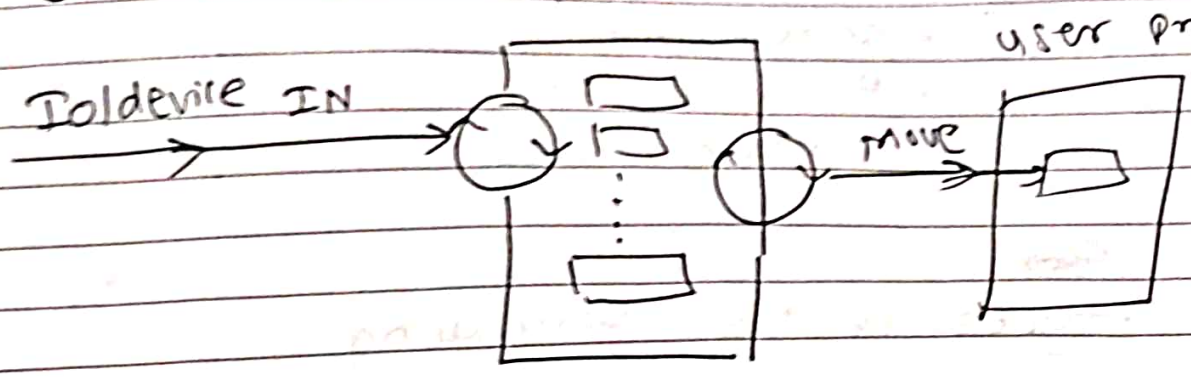
- only one buffer

③ Double buffering



- buffer swaping

④ circular buffer

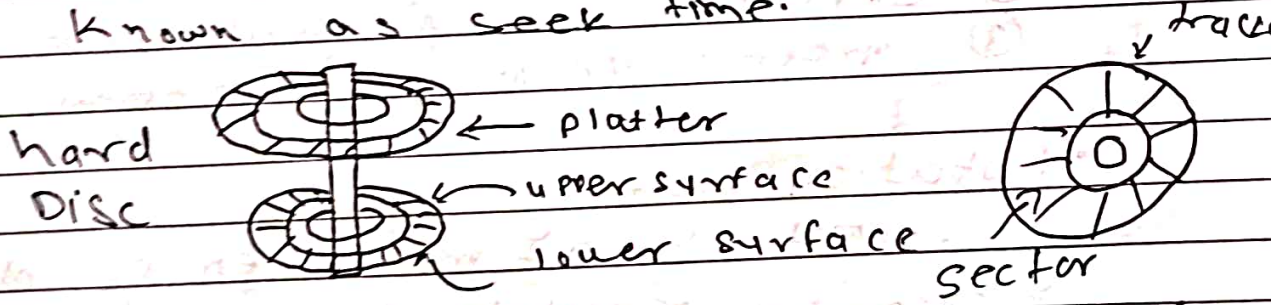


- Two or more buffer.
- Each individual buffer is one unit in circular
- used when #o operations must keep upwith proces

Q- Dissruss various Disk Scheduling Methard.

→ To minimize the seek time we use DISC scheduling

Time taken to reach desire track is known as seek time.



To reach sector

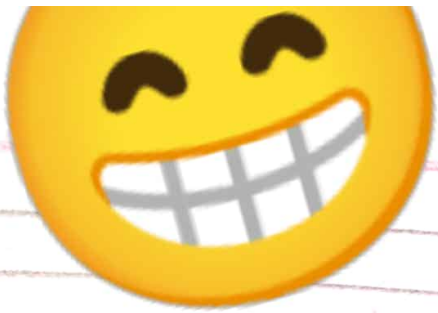
↓

reach to platter

↓

reach to surface → reach to sector (upper/lower).

all this process need a time is time called seek time



Time

- seek time
- Rotational time
- transfer time.

Disc

Types of Disc Scheduling

1. FCFS
2. SSTF (Shortest seek time first)
3. SCAN
4. Look
5. C Scan
6. C Look.

- Disk scheduling benifits.
  1. Reduce seek time.
  2. efficient use of hard drive.
  3. Lower disk arm movement

- Rotation latency
  :- It is a time taken by desire sector to rotate into position so that it can access r/w.

Disk delay	seek time	Rotation latency	transfer time

← Disc access time →

← Disc response time →

classmate
Date
Page

1. File sharing (Short Note).

2. DISC ~~Sh~~ Scheduling.

- FCFS
- SSTF
- SCAN
- CSCAN
- LOOK
- CLOOK

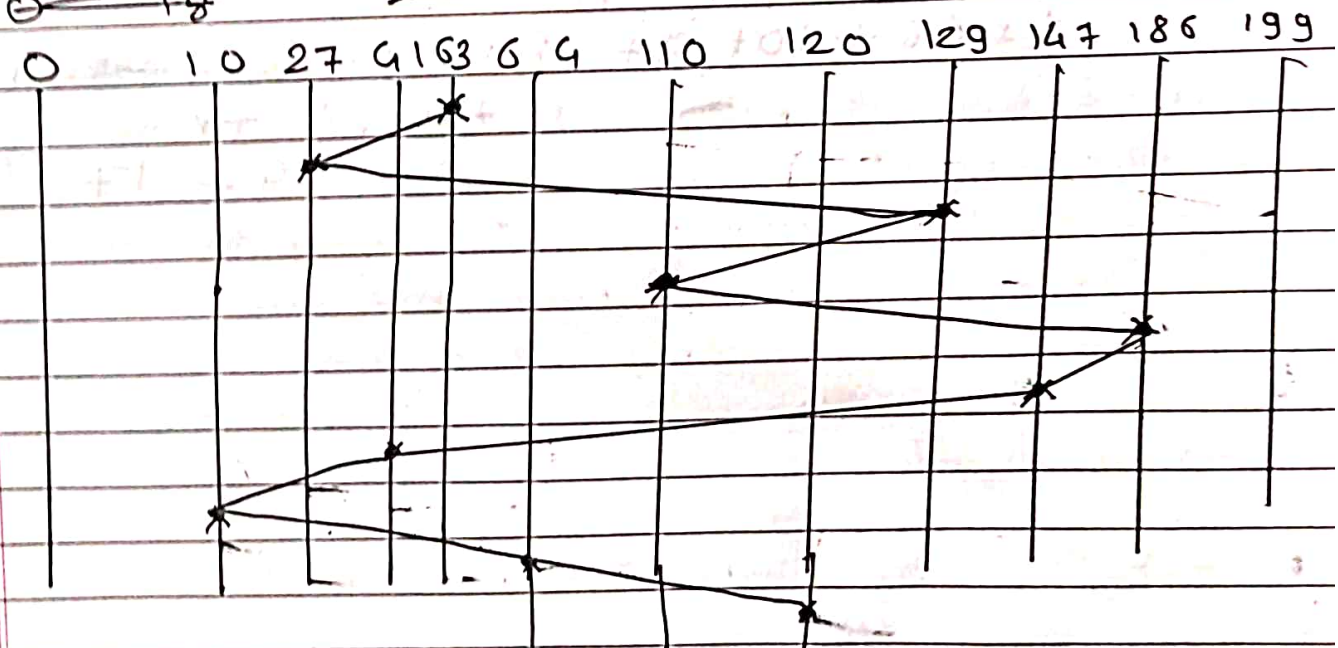
① A Disc drive has 200 cylinders numbered from 0-199. The drive is currently serving the request at cylynder 63. The queue of pending requests in FIFO order 27, 129, 110, 186, 147, 41, 10, 64, 120.

① FCFS ② C-Scan ③ C-Look ④ SSTF

→ ~~0 27 129~~ FCFS

~~0 18~~

199



$36 + 102 + 19 + 78 + 39 + 106 + 31 + 59 + 56$

~~483 = 53.66~~ $619 = 68.77$

~~9~~

27, 129, 10, 186, 147, 91, 110, 120, 63

~~27 129 10 186~~

② SSTF

63 → 64 → 91 → 27 → 10 → 110 → 120 → 129 → 147 → 186

= 1 + 23 + 14 + 17 + 100 + 10 + 9 + 18 + 39

= 231/9 = 25.66

③ SCAN

10 27 ~~91~~ ~~64~~ 64 110 120 129 ~~147~~ 186

63 → 64 → 110 → 120 → 129 → 147 → 186 → 91 → 27 → 10

1 + 46 + 10 + 9 + 18 + 39 ~~+ 129 + 64~~ + 145 + ~~13~~ + 14 + 17

299

reffer textbook for the numericals

- ## File Sharing :-

File sharing is important when the system is multiuser, where the file sharing is in number of user. In multiuser while sharing 2 issues arises.

1. Access Right
2. management of Simultaneous access

1. Access Right

Access Right Provides number of options in which way particular file can be accessed

ⓐ None: To enforce restriction, the user would not allowed to read user directory that include that file

ⓑ Knowledge: The user can determine that the file is exist & who is the owner.

ⓒ Execution: The user can load & execute the program file but cannot copy it.

ⓓ Reading: The user can reading the file for any purpose, including copying and execution.

ⓔ Appending: The user can add data to the file but cannot modify or delete any file of the content.

ⓕ Updating: The user can modify, delete and add the data to the file.

ⓖ Deletion: user can delete file from system

ⓗ Specific user: Any Indival user

ⓘ user group: set of user ⓙ All: All the user who have access to the system.

2. Simultaneous Access:

- when access is granted to append or update a file to more than one user OS or file management must enforce the Deciplin.
- Brute-Force Approch is to lock the entire file when we are updating it.

"File sharing is also known as file-swapp

It is accessing or sharing of file by one or more users or user group.

- More than one administrator.
- WWW: Large scale file sharing system

- Content of file •
  - ① File Name
  - ② File type
  - ③ File organization

  } Basic

  - ① Volume
  - ② Starting Address
  - ③ Size used
  - ④ Size allocate

  } Address information

  - ① owner
  - ② Access Information
  - ③ Permited Actions

  } Access control Infor

① Date created
② Identity of creator
③ Date last read access
④ Identity of Last reader
⑤ Last date modified
⑥ Identity of Last modifier
⑦ Date of Last Backup.
⑧ Current usage

} usage Information

- Directory Structure:

① operations performed on file:

① Search (grep)
② Create (chmod)
③ Delete (rm)
④ List Directory (ls)
⑤ Update Directory.

② Logical Struture of Directory:

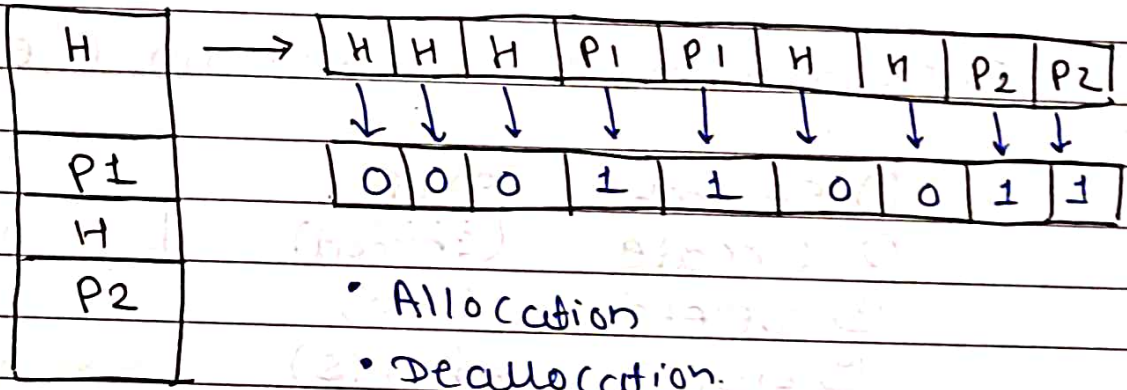
Free space Management:

When memory is allocated dynamica
It is responsibility of OS to manageme
it properly.

Techniques to manage free space.

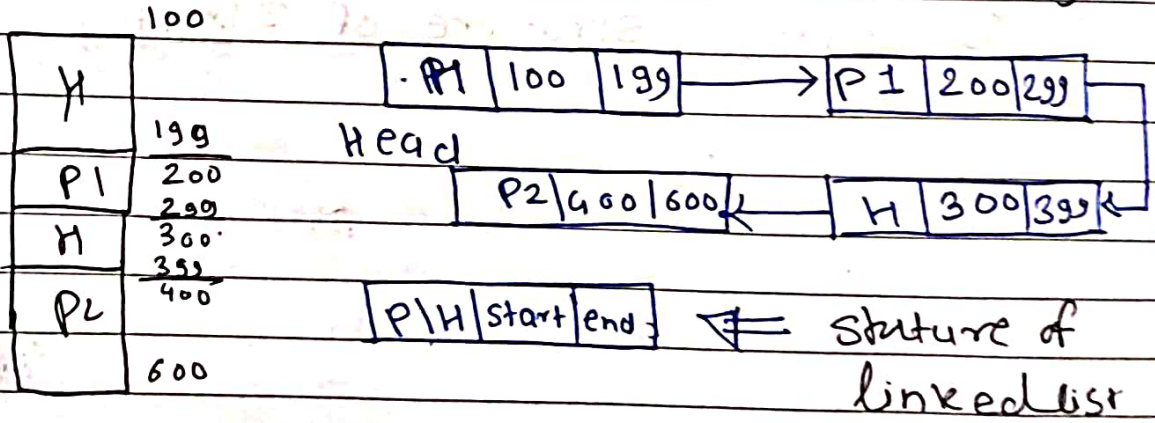
① Bitmap ② Linked list ③ Grouping ④ Cou

① Bitmap / vector free space managemen

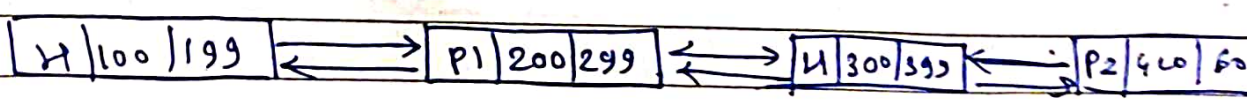


- Allocation
- Deallocation.

② Linked list free space managem



Singly linked list



Doubly linked list

(more efficient)