

1 2

05

- Each disc platter has a flat circular shape like a CD. We
- We store info by recording it magnetically on the platters.
- The surface of a platter is logically divided into circular tracks which are subdivided into sectors.

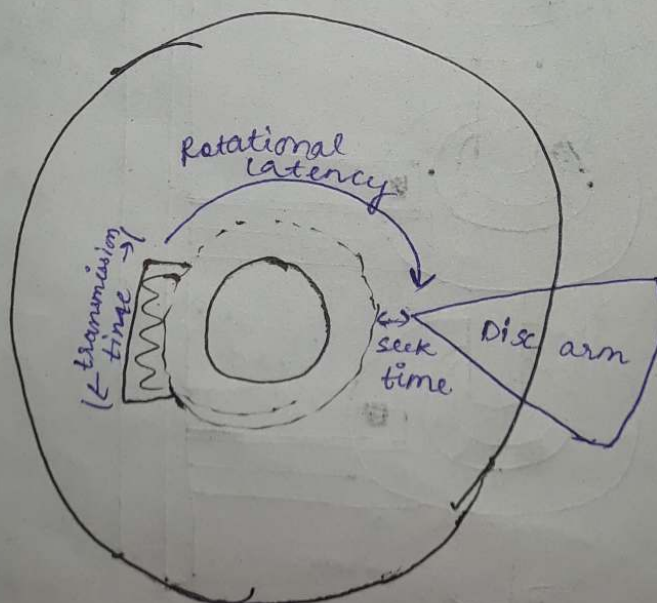
The Cylinder - The set of tracks that are at one-arm position makes up a cylinder.

- There may be thousands of co-centric cylinders in a disc drive and each track may contain hundreds of sectors.

Disc Speed - [1, 2, 3, 4, 5, 6, 7, 8, 9]

It has two parts -

- Transfer Rate - It is the rate at which data flows b/w the drive and the computer.
- Random access time/Positioning time - It consists of -
 - Seek time - The time necessary to move the disc arm to the desired cylinder.
 - Rotational latency - The time necessary for the desired sector to rotate to the disk head.
 - Transmission time - Time for all desired data to spin by read/write head.



Disc Scheduling -

i) FIFO disc scheduling -

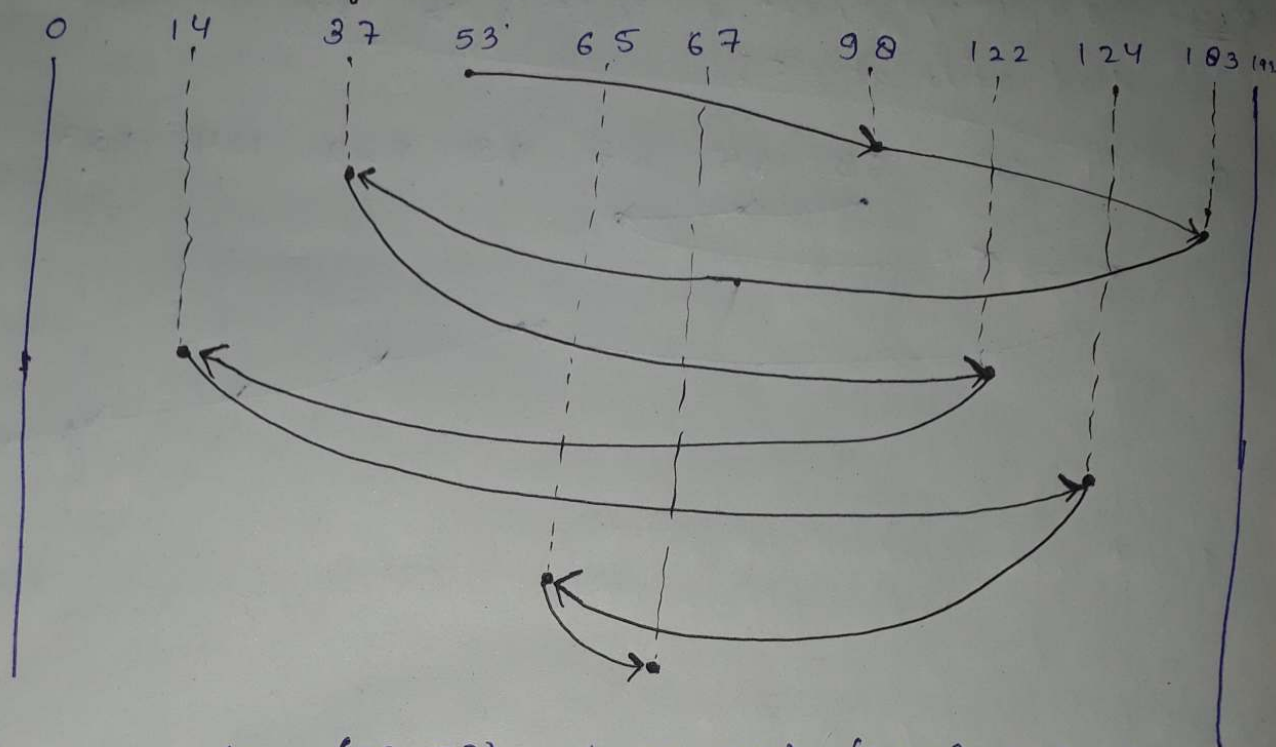
This algorithm is quite fair but it generally does not provide the fastest service.

Ques. Queue = 90, 103, 37, 122, 14, 124, 65, 67

Head starts at 53.

Find the number of head movements.

Solⁿ



$$\begin{aligned}\text{Head movement} &= (90-53) + (103-90) + (103-37) + (122-37) \\ &\quad + (122-14) + (124-14) + (124-65) + (67-65) \\ &= 640\end{aligned}$$

OR

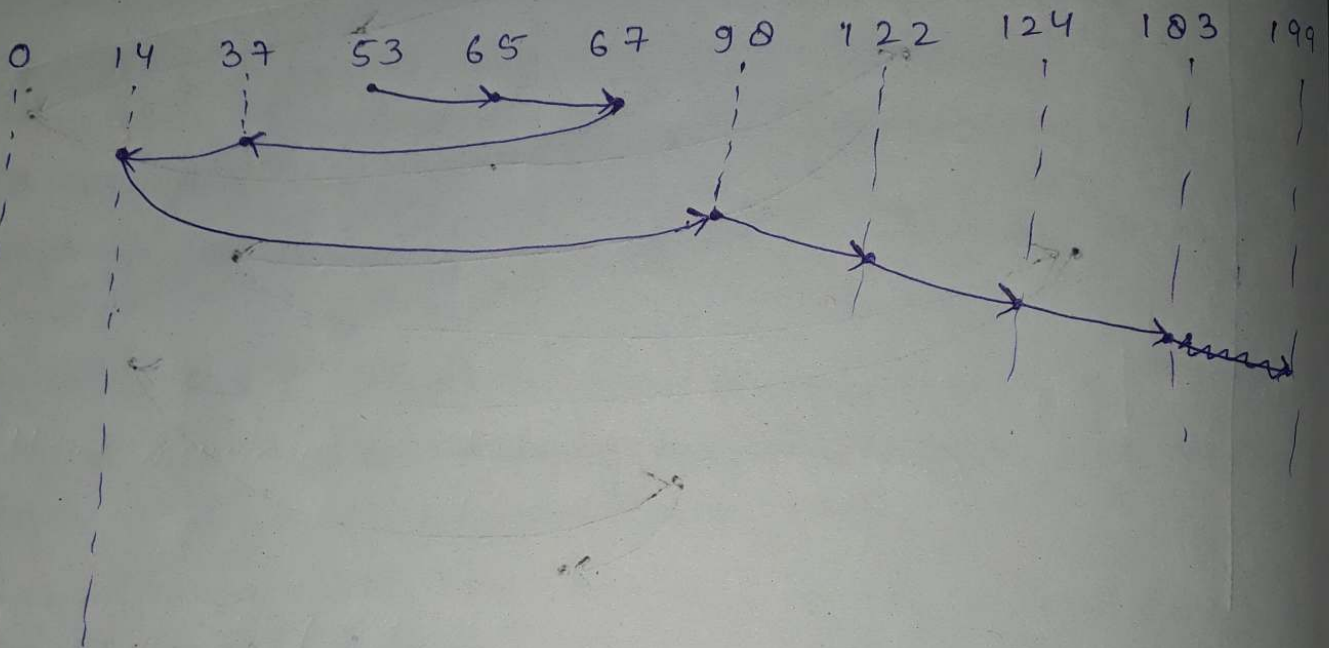
$$\begin{aligned}&(103-53) + (103-37) + (122-37) + (122-14) + (124-14) \\ &\quad + (124-65) + (67-65) \\ &= 640\end{aligned}$$

Shortest Seek time First (SSTF) DSA -

- The SSTF algo selects the request with the least seek time from the current head position. In other words SSTF chooses the pending request closest to the current head position.
- SSTF is essentially a form STF scheduling and just like STF it may cause starvation of some request.

Queue = 98, 103, 37, 122, 14, 124, 65, 67

Head starts at = 53



Head movement = $(67 - 53) + (67 - 14) + (183 - 14)$

$\Rightarrow 14 + 53 + 169$

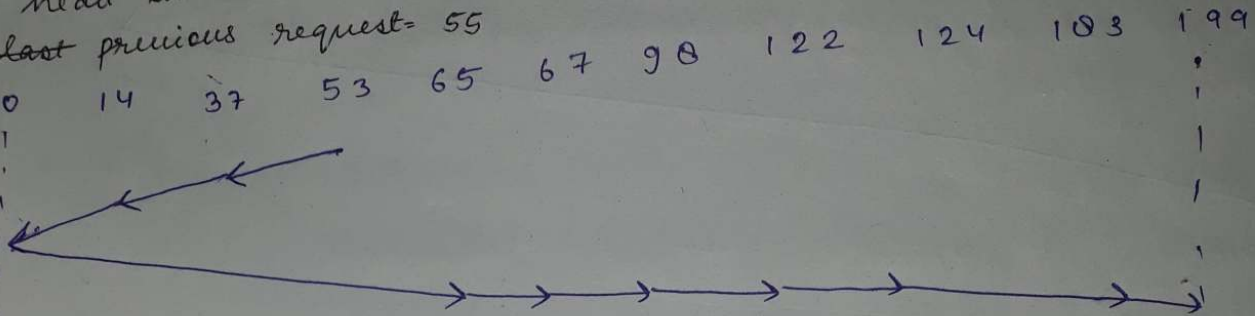
$\Rightarrow 236$ ans

S-SCAN Algorithm -

ques. Queue = 98, 103, 57, 122, 14, 124, 65, 67

head starts = 53

last previous request = 55



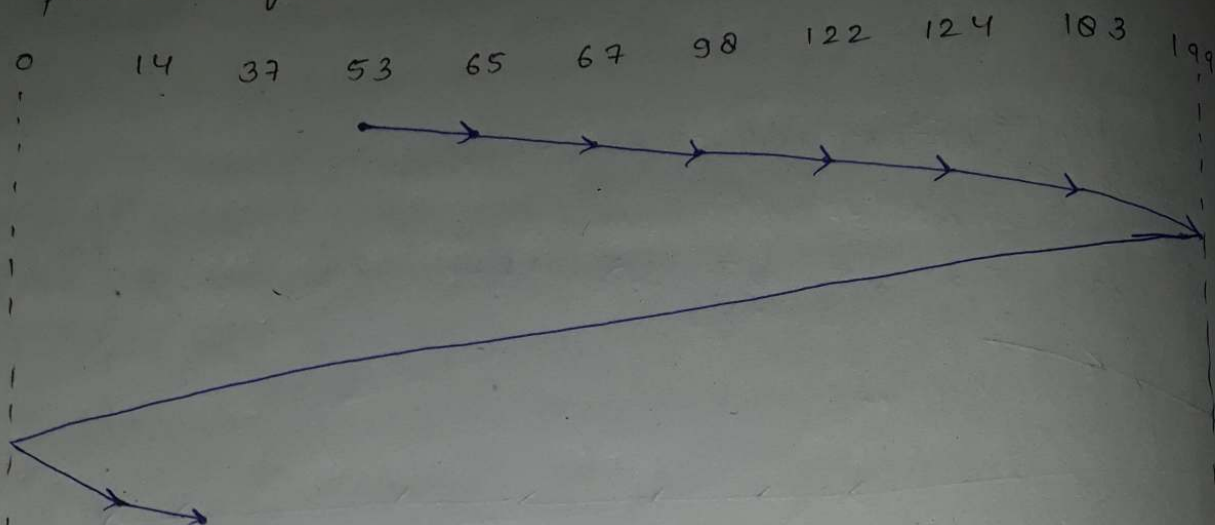
$$\begin{aligned}\text{Head Movement} &= (53 - 9) + (109 - 14) \\ &= 53 + 105 \\ &= 238\end{aligned}$$

Circular Scan (C-Scan) Algorithm.

like scan like scan, C-scan moves one end of the disk to the other servicing request along the way.

When the head reaches the other end, it immediately returns to the beginning of the disc w/o servicing any request on the returned trip.

Ques. Queue - 90, 103, 37, 122, 14, 124, 65, 67
 head starts = 53
 previous request = 50

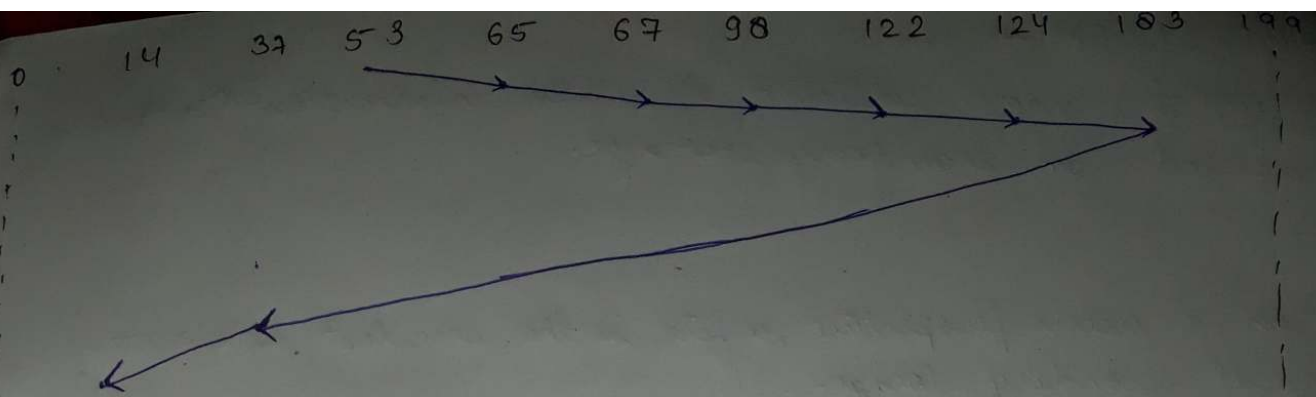


$$\text{Head movement} = (199 - 53) + (199 - 0) + (37 - 0) \\ = 146 + 199 + 37 = 382$$

Look Scheduling Algorithm -

- The arm goes only as far as the final request in each direction then it reverse direction immediately w/o going all the way to the end of the disk.

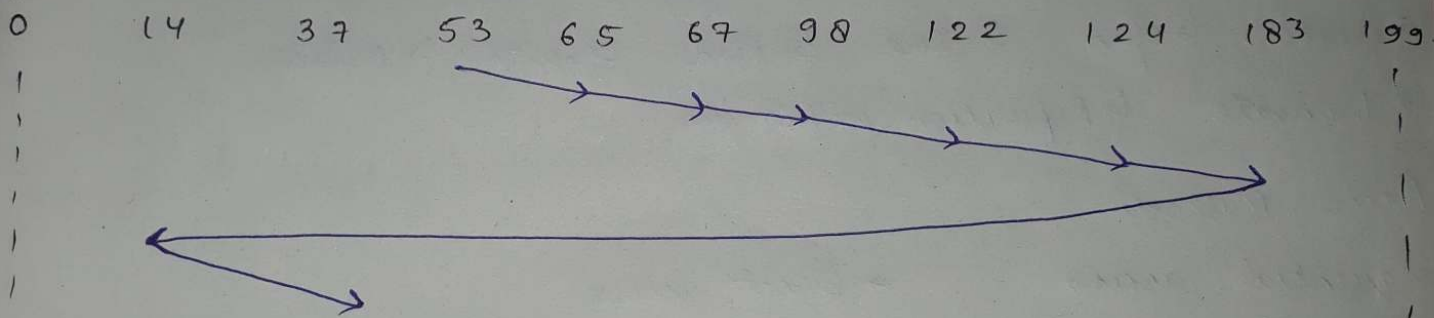
Ques. Queue = 90, 103, 37, 122, 14, 124, 65, 67
 head starts = 53
 previous request = 50



$$\begin{aligned}\text{Head Movement} &= (183 - 53) + (183 - 14) \\ &= 130 + 169 = 299\end{aligned}$$

C-look Scheduling Algo. - Same as C-scan.

Ques.



$$\begin{aligned}\text{Head Movement} &= (183 - 53) + (183 - 14) + (37 - 14) \\ &= 130 + 169 + 23 \\ &= 299 + 23 = 322\end{aligned}$$

H.W. Write short note on:

- ① disk management ② swap space management
- ③ disk reliability ④ RAID

RAID → Redundant arrays of Independent Disk

12/12/22

FILE SYSTEM -

A file is a name collection of related information ~~that~~ recorded on secondary storage.

From a user's perspective, a file is the smallest allotment of logical secondary storage.

Data can not be written to secondary storage until they are within a file.

File attributes -

↳ name ↳ attribute ↳ Type ↳ location ↳ size
↳ protection ↳ Time, date and user identification

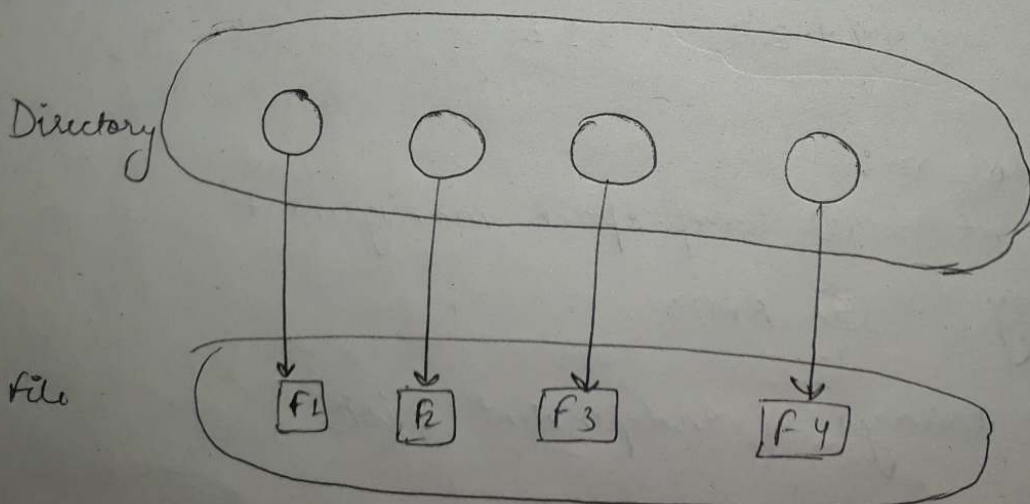
File operations -

↳ Create ↳ open ↳ close ↳ Read ↳ write ↳ Delete
↳ Truncate ↳ Reposition within file

Access Methods -

↳ Sequential access → Direct access.

Directory - The directory can be viewed as a symbol table that translates file name into their directory entries. Both the directory structure and the files reside on the disk.



operation performed on directory -

↳ create a file

↳ search a file

↳ delete a file

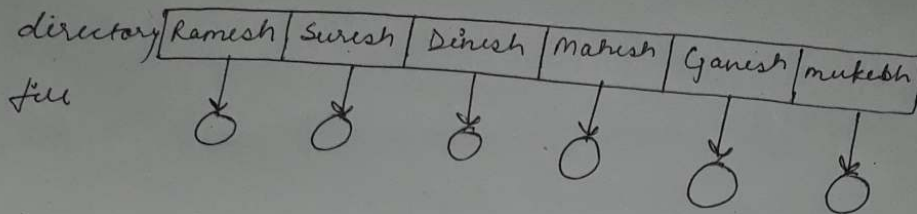
↳ list a directory

↳ remove a file

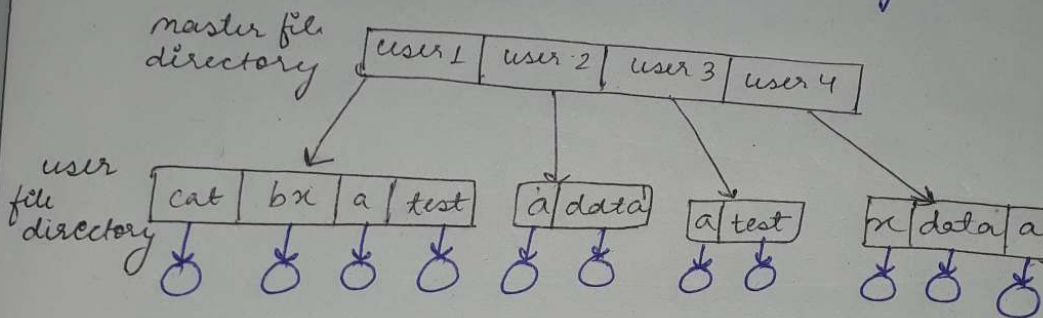
↳ traverse the file system

Logical Structures of directory.

① Symbol Table Directory - A single table directory for all users.



② Two-level directory - Separate directory for each user.



Advantages/Disadvantages (H.W.)

③ Tree Structure directory (H.W.)

system calls
PCB
Schedulers
Page Replacement
Belady's anomaly
Segmentation
Partitioning Num.
Demand paging
disk scheduling
RAID
File access method

① Acyclic graph directory -
General

② Efficiency & performance -