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page → 1

Q.1

1)

Different access methods for files

1) sequential access
2) Random or direct access
3) other access methods

1. sequential access →

The simplest access method is sequential access. Early. operation system provided only this kind of file. access

In this type of file access, process reads all the records in a file in order one record after other starting at the beginning.

While accessing, skipping of any record or reading them out of order is not possible.

This access method was convenient for storage Medium such as magnetic tape to a certain extent than disks.

2. Random or direct access →

When use of disk started for storing files, it became possible to read the bytes or records of a file out of order. It is become, disks allow random access to any file block.

It also become possible to access records by its key instead of by position. Files whose bytes or records can be read in any order are called random access files. They are required by many application such as database system.

If railway customer calls up and wants to reserve a seat on a perticular train, the reservation program must be able to access the record for that train directly instead of reading hundreds of records of other trains first.

3. other access method →

These access method can be built on top of a random access method

These method generally involve the construction of an index for the file

The index has pointer to the various blocks.

Several factor are important of file organization • Economy of storage • minimum access time • Easy update • Reliabity

Name → Hemant Dilip Tighade

ROLL NO → 19CE1069

Batch → B4

sign → Hemant

page → 3

iii)

paging	segmentation
1. A page is contiguous range of memory addresses which has mapped to physical memory	1. A segment is an independent address space. Each segment has addresses in a range from 0 to maximum value.
2. It has only one linear address space	2. It has many address spaces.
3. programmer does not know that it is implemented.	3. programmer knows that it is implemented
4. procedures and data cannot be separated.	4. procedure and data can be separated
5. procedures cannot be shared between user.	5. procedures can be shared between users.
6. A page is a physical unit	6. A segment is a logical unit
7. A page is of fixed size	7. A segment is of arbitary size

Name → Hemant Dilip Tighade
Roll No → 19CE1069
Batch → B4
sign → Hemant
page → 4

Q.2) iii)
Disk scheduling is done by operating system to schedule I/O request arriving for the disk. Disk scheduling is also known as I/O scheduling.

Disk scheduling is important because:
- Multiple I/O requests may arrive by different processes. and only one I/O request can be served at a time by the disk controller. Thus other I/O request needs to wait in the waiting queue and need to be scheduled.
- Two or more request may be far from each other so can result in greater disk arm movement

Disk scheduling Algorithms ⇒

1- FCFS: FCFS is the simplest of all the Disk scheduling Algorithm. In FCFS the request are addressed in the order they arrive in the disk queue Let us understand this with the help of an example

Example→
Suppose the order of request is (82, 170, 43, 140, 24, 16, 190)
And current position of Read / write head is 50

So total seek time
= (82-50) + (170-82) + (170-43) + (140-43) + (140-24) + (24-16) + (190-16)
= 642

Name → Hemant Dilip Tighade

Roll No → 19CE1069

Batch → B4

sign → Hemants

page → 5

2. SSTF → In SSTF (shortest seek Time First) request having shortest seek time are executed first. so the seek time of every request is calculated in advance in the queue and then they are scheduled according to their calculated seek time. As a result, the request near the disk arm will get executed first. SSTF is certainly an improvement over FCFS as it decreases the average response time and increase the through put of system.

Example>

suppose the order of request is.

(82, 170, 43, 140, 24, 16, 190)

So total seek time

= (50-43) + (43-24) + (24-16) + (82-16) + (140-82) + (170-40) + (190-170)

= 208.

Name → Hemant Dilip Tighade
Batch → B4
Roll No → 19CE1069
sign → Hemant
pages 6

3- SCAN : In this algorithm the disk arm moves into a particular direction and services the request coming in its path and after reaching the end of disk, it reverses its direction and again. services the request arriving in its path. So this algorithm works as an elevator and hence also known as elevator algorithm

Example
requestes to be addressed are-82, 170, 43, 140, 24, 16, 190 and the read write arm is at 50. and it also given that the disk arm should move "towards the large value"

seek time = (199-50) + (199-16)
= 332.

4. CSCAN → In SCAN algorithm the disk arm again scans the path that has been scanned, after reversing its direction. so it may be possible. that too many requests are waiting at the other end or there may be zero or few requests pending at the scanned area.