

5. File Organization / Management

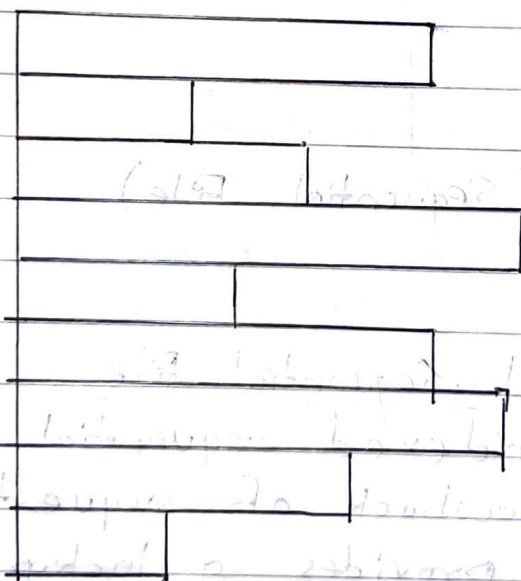
Q.1 Give details of File organization types.

⇒ • Five fundamental organization of file :-

1) Pile

⇒ It is simplest form of file organization.

- Data is collected in the order they arrive.
- Purpose is to accumulate the mass of data and save it.
- Record is accessed by exhaustive search.
- A pile file does not have any structure.



(Pile File)

2) Sequential File

⇒ It is most commonly used and records have a fixed format.

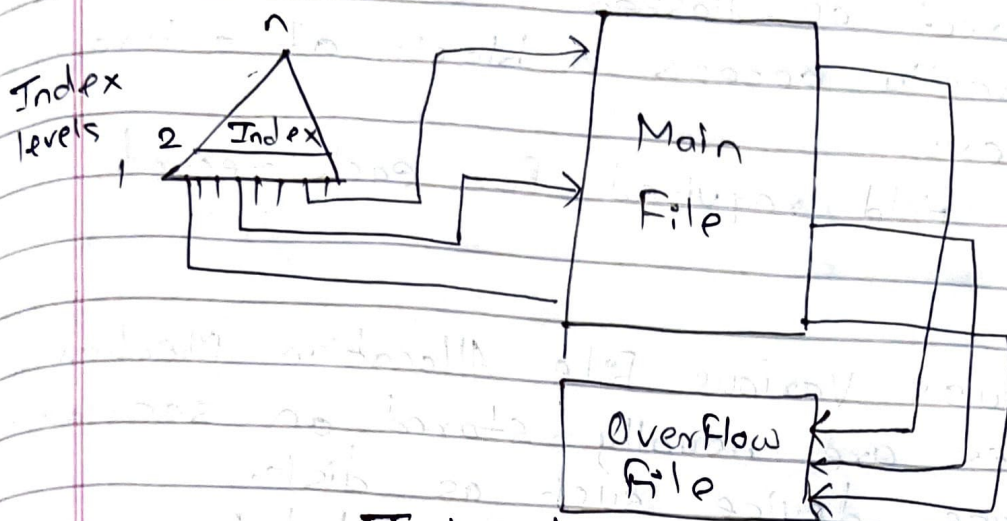
- Each and every record in the file has same length.
- The field name and each field length are attributes of file structure.

- One field is the key field
 - ⇒ a) uniquely identifies the record
 - b) Record are stored in key sequence.
- New records are placed in log file or transaction file.

(Sequential File)

3) Indexed Sequential File

- ⇒ The indexed sequential file eliminates the drawback of sequential file.
- Index provides a lookup capability to quickly reach the vicinity of the desired record.
- New records are added to the overflow file.

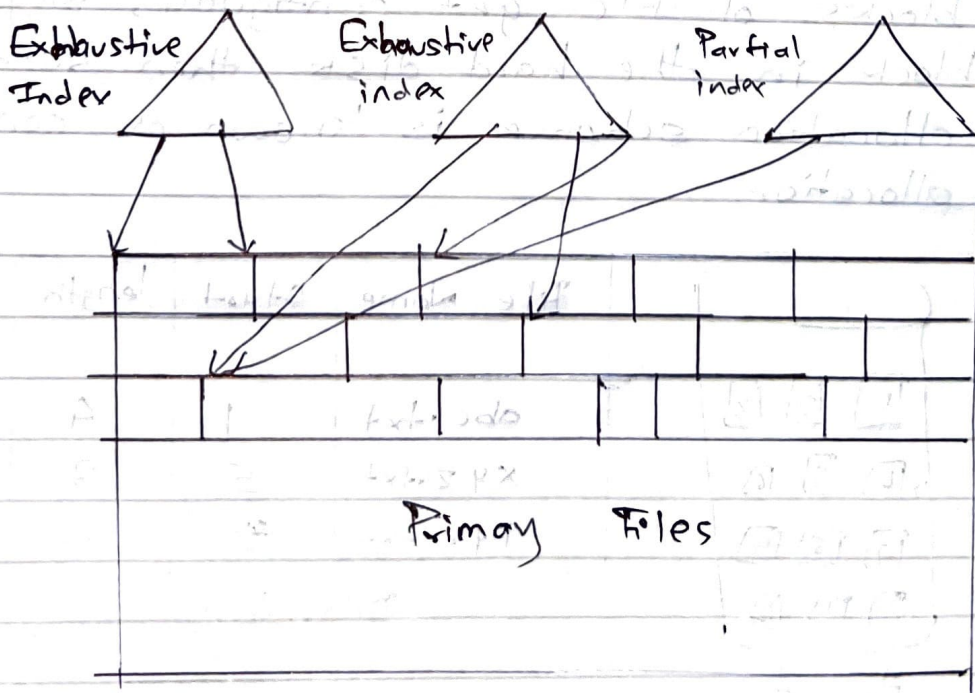


Indexed Sequential File

4) Indexed File

⇒ Uses multiple indexes for different key fields

- May contain an exhaustive index that contains one entry for every record in main file.
- May contain partial index.



5) Direct OR Hashed File

⇒ Directly access a block at a known address.

— Key field required for each record.

Q.2 Discuss Various File Allocation Mechanism

⇒ i) Files are usually stored on secondary storage device such as disk.

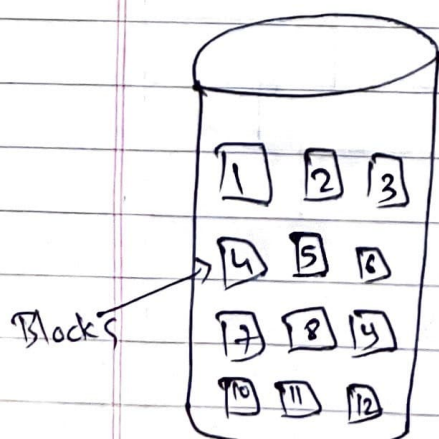
ii) These files are then called back when needed. As part of implementation, these files must be stored in hard disk.

iii) There are following methods used majority in different OS

⇒

a) Contiguous Allocation

⇒ IF the blocks are allocated to the file in such a way that all the logical blocks of file get contiguous physical block in the hard disk then such allocation scheme is known as contiguous allocation.



File Name	Start	length	allocated blocks
abc.txt	1	4	1, 2, 3, 4
xyz.txt	5	3	5, 6, 7
pqr.txt	9	3	9, 10, 11

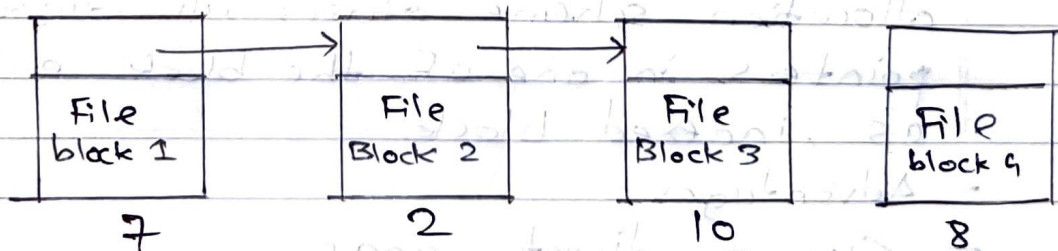
Directory

Hard disk

- In above example, there are three files in directory. The starting block and length are mentioned in table.
- We can check in the table that the contiguous blocks are assigned to each file as per its need.
- Advantages
 - ⇒ It is simple to implement.
- Disadvantages
 - ⇒ The disk will become fragmented.

b) Linked List Allocation

- ⇒ Linked list allocation solves the problem of contiguous allocation.
- In this, each file is considered as the linked list of disk blocks.
- Each disk block allocated to a file contains a pointer which points to the next disk block allocated to the same file.



Physical
block

- Advantages
 - ⇒ There is no external Fragmentation.
- Disadvantages
 - ⇒ Need to traverse each block.

c) Linked list allocation using table in memory

⇒ Each block needs to store pointer information therefore entire block is not fully used to store file content.

Physical	Next block
0	2
1	13
2	18
3	12

- Advantages

⇒ Random access is much easier.

- Disadvantages

⇒ Whole table must be in the memory all the time to make it work.

d) Indexed Allocation

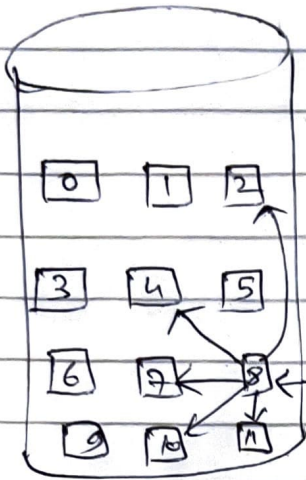
⇒ Instead of maintaining a file allocation table of all disk pointers, indexed allocation scheme stores all disk pointers in one of the block called as indexed block.

- Advantages

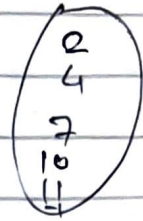
⇒ Support direct access.

- Disadvantages

⇒ More pointer overhead.



File Index
block - 8



Index blocks.