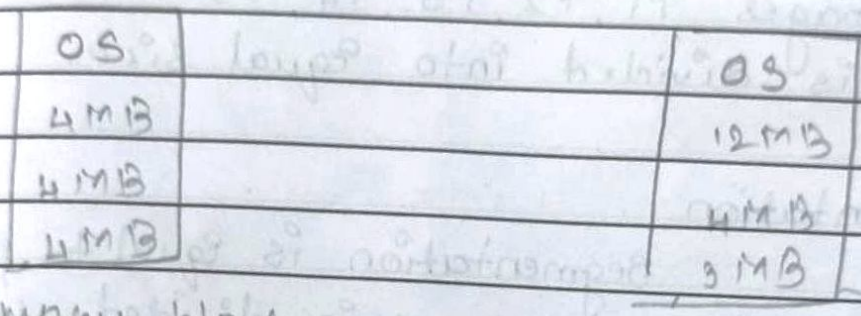
* Contiguous Memory Allocation type:

1. fixed size partitioning

The memory is partitioned into blocks of fixed size.

- It is a static memory allocation / partition.



2. variable size

The memory is partitioned as per the variable size.

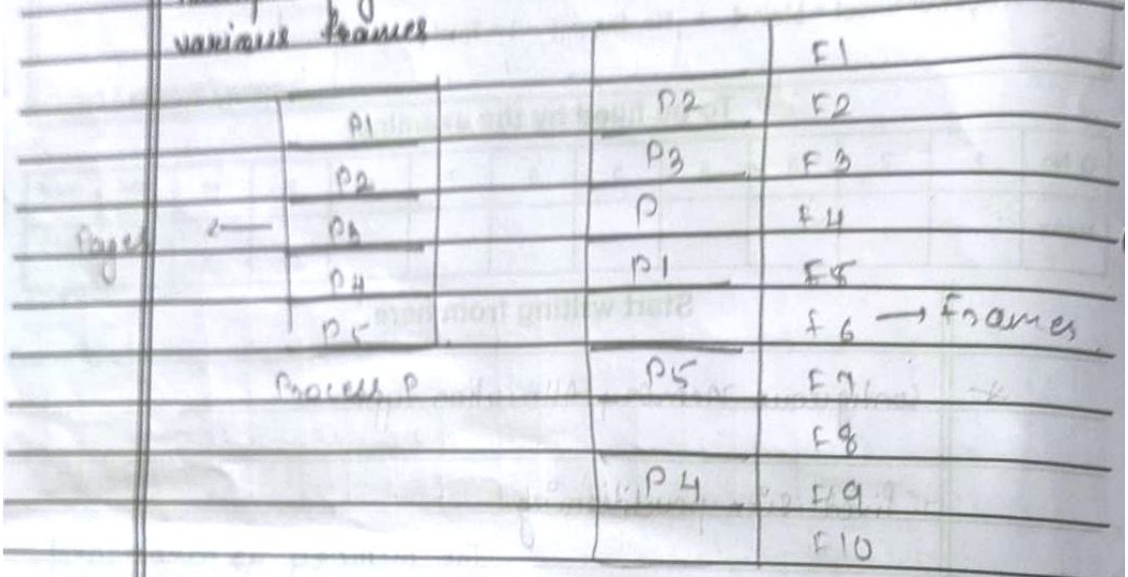
It is a dynamic partition

Non Contiguous Memory

1. Paging:

Paging is a non-contiguous memory management technique that allows the OS to fetch processes from secondary memory & store them in main memory in the form of pages.

- In the process in secondary memory is divided into multiple pages, & the main memory divided into various frames.



There is a P of 500kB/MB which is divided into five pages P1, P2, P3, P4, P5
Each is divided into equal size.

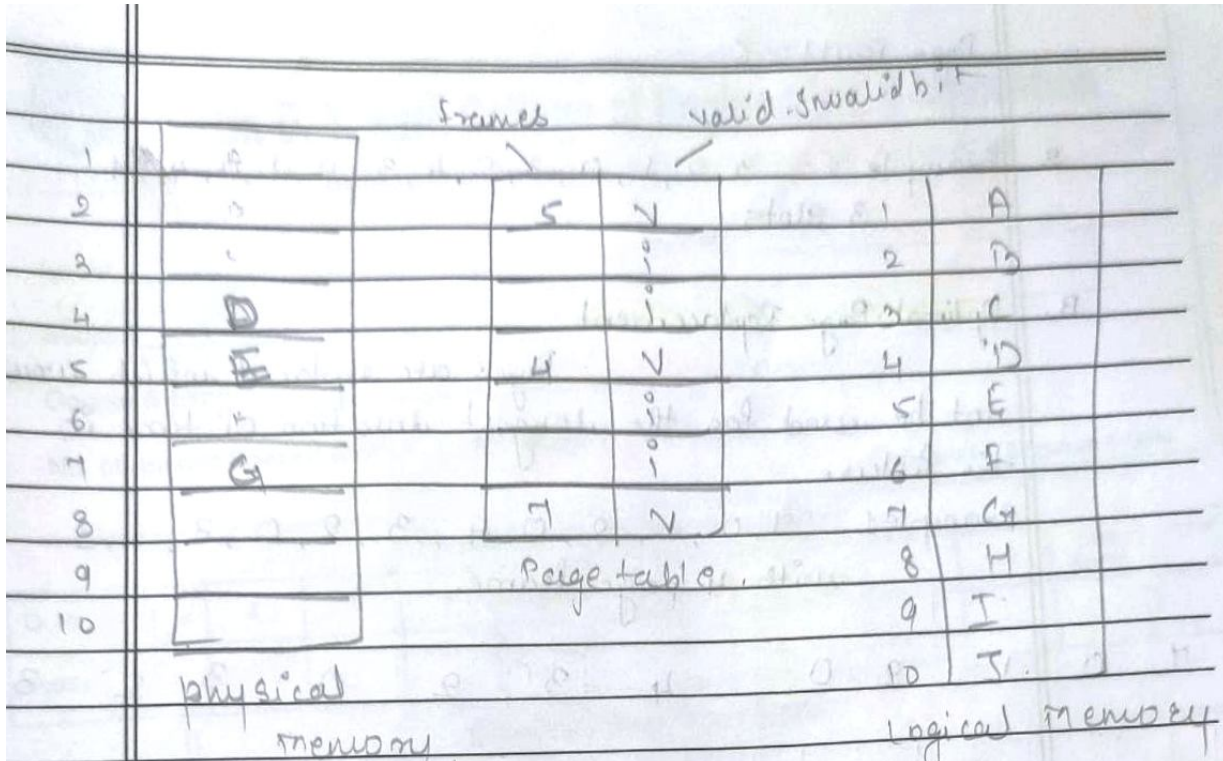
2. Segmentation

Segmentation is equal to pagging, but in segmentation process is divided as per the variable size

* Demand Paging:

Demand paging is a process in which data is moved from secondary memory to RAM on a demand basis.

- All Data is not stored in the main memory bcoz the space is limited in RAM.
- Demand paging is a memory management scheme employed by modern OS to manage physical memory resources



2. Page Replacement Concept

Page replacement is needed in the OS that use virtual memory using Demand Paging. Only a set of pages of a process is loaded into the memory.

- Page Replacement Algorithm.

A. First In First Out: (Belady's anomaly)
Simplest Alg^n.

- the OS keeps track of all pages in the memory in a queue, the oldest page is in the front of the queue.

- when the page needs to be replaced page in the front of the queue is selected for removal.

Eg. 1, 3, 0, 3, 5, 6, 3 with 3 page frames.

	1	3	0	3	5	6	3
		1	3	0	3	5	6
			1	3	0	3	5

Page fault =

e. Example 2: 3, 2, 1, 0, 3, 2, 4, 3, 2, 1, 0, 4 &
3 slots

B. Optimal Page Replacement:
Pages are replaced which would not be used for the longest duration of time in the future.
Example: 7, 0, 1, 2, 0, 4, 3, 2, 0, 3, 2, 3
with 4 page frame.

7 0 1 2 0 4 3 2 0 3 2 3

		2	2	2	2	2	2	2	2	2	
		1	1	1	1	3	3	3	3	3	3
	0	0	0	0	0	0	0	0	0	0	
7	7	7	7	7	4	4	4	4	4	4	4
Miss	Miss	Miss	Miss	Hit	Miss	Miss	Hit	Hit	Hit	Hit	Hit

Total Page fault : 6

Example 3: 4, 3, 8, 2, 1, 3, 0, 4, 0, 1, 2, 4, 2, 0, 2
with 4 page frame.

C. Least Recently Used:
Page is replaced which is least recently used.
Example 1: 7, 0, 1, 2, 0, 4, 3, 2, 0, 3

7 0 1 2 0 4 3 2 0 3

		2	2	2	2	2	2	2	
		1	1	1	3	3	3	3	3
	0	0	0	0	0	0	0	0	
7	7	7	7	4	4	4	4	4	4

4. **Most Recently Used**

Page will be replaced which has been used recently

Eg. 7, 0, 1, 2, 3, 0, 4, 0, 8, 7, 4, 2

7	0	1	2	3	0	4	0	8	7	4	2
		2	3	3	3	3	3	3	3	3	3
	1	1	1	1	1	1	1	1	1	1	1
0	0	0	0	0	4	0	8	8	8	8	
7	7	7	7	7	7	7	7	7	4	2	
				Hit				Hit			

Page fault : 10

1. Eg. 4, 3, 2, 1, 0, 3, 4, 5, 6, 8, 9, 6, 5, 4, 9,
5 frames most recently

2. 8, 4, 0, 2, 1, 6, 8, 2, 1, 8, 6, 5, 2, 1
4 frames FIFO

3. 6, 8, 2, 4, 0, 2, 4, 0, 2, 5, 6, 1, 2, 1, 6
4 frames OPR.

4. 3, 2, 0, 1, 2, 1, 3, 4, 0, 6, 5, 2, 7
3 frames LRU.