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CS - B1
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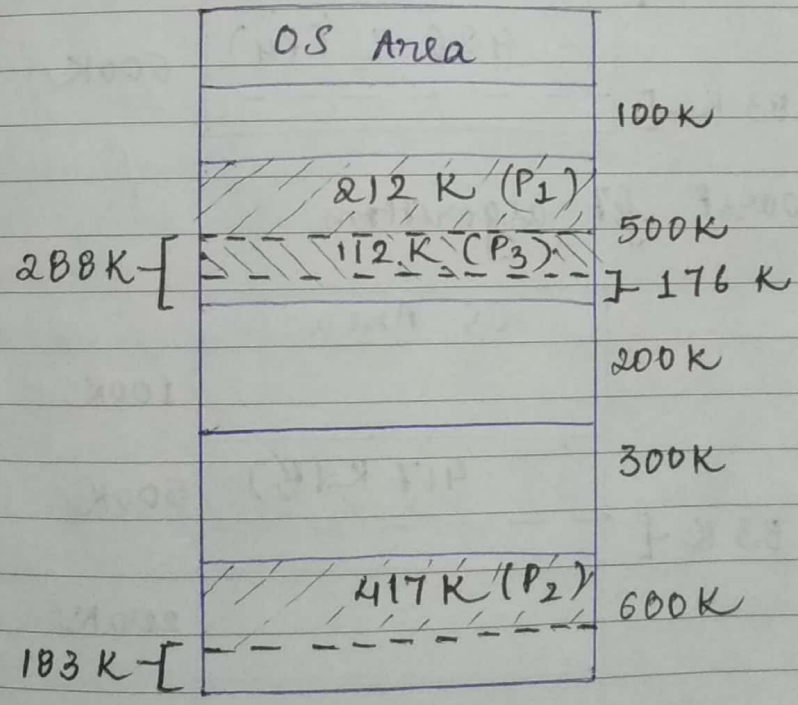
2020 Tuesday May 12

Assignment - 3 Operating System

Q1] Given memory partitions of 100K, 500K, 200K, 300K and 600K (in order). How would each of the first-fit, Best fit and worst fit algorithms place processes of 212K, 417K, 112K and 426K (in order)? Which algorithm makes the most efficient use of memory?

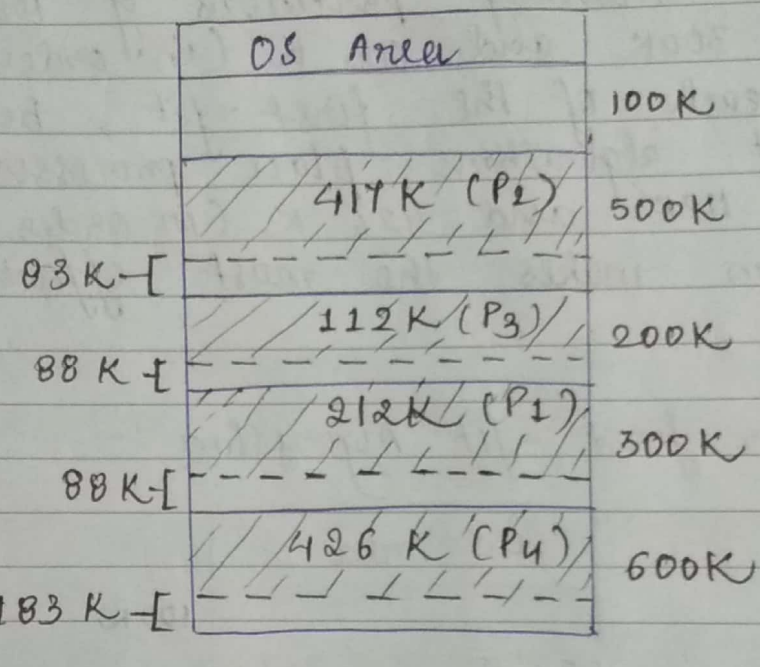
Soln) i) For first-fit Algorithm :-



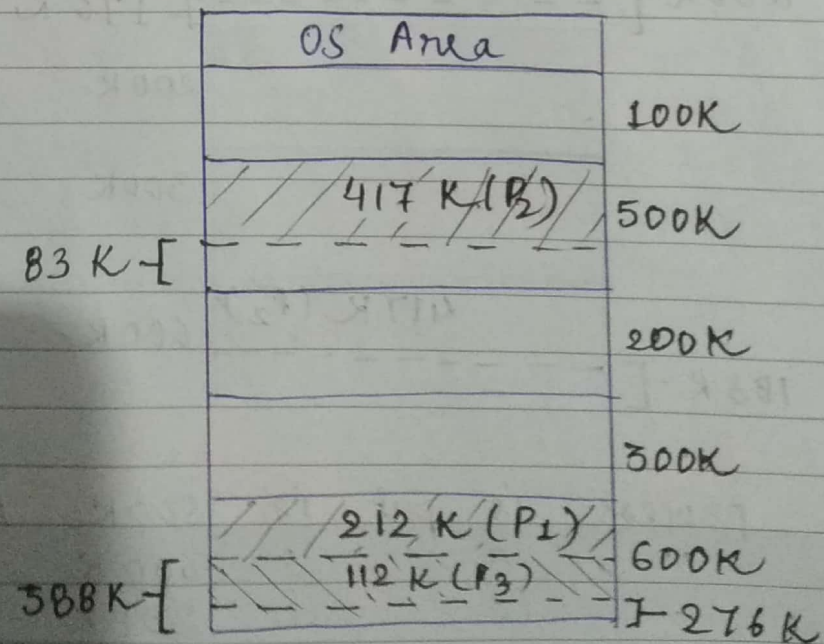
NOTES:
- 212 K process is put in 500K partition.
- 417 K " " " " 600K " .
- 112 K " " " " 288K partition. (500 - 212 = 288K)

• 426 K process must wait

ii) For Best call fit algorithm



iii) for worst fit algorithm



NOTES

Best fit algorithm makes the most efficient use of memory as it wasted less amount of memory space

Q2] Explain the difference b/w internal and external fragmentation

External fragmentation	Internal fragmentation.
1) The difference b/w the memory allocated and the required memory is called internal fragmentation.	1) The unused spaces formed b/w non-contiguous memory fragments are too small to serve a new process request
2) It occurs when is divided into fixed size blocks regardless of the size of process.	2) It occurs when memory is allocated to process dynamically based on process requests.
3) It refers to the unused space in the partition which resides with an allocated region.	3) It refers to the unused memory block that are too small to handle a request.
4) It can be eliminated by allocating memory to processes dynamically.	4) It can be elimina-ted by → Compaction Paging, segmentation.

15 | 2020 Friday May
136-230 • WK 20

05 May 2020

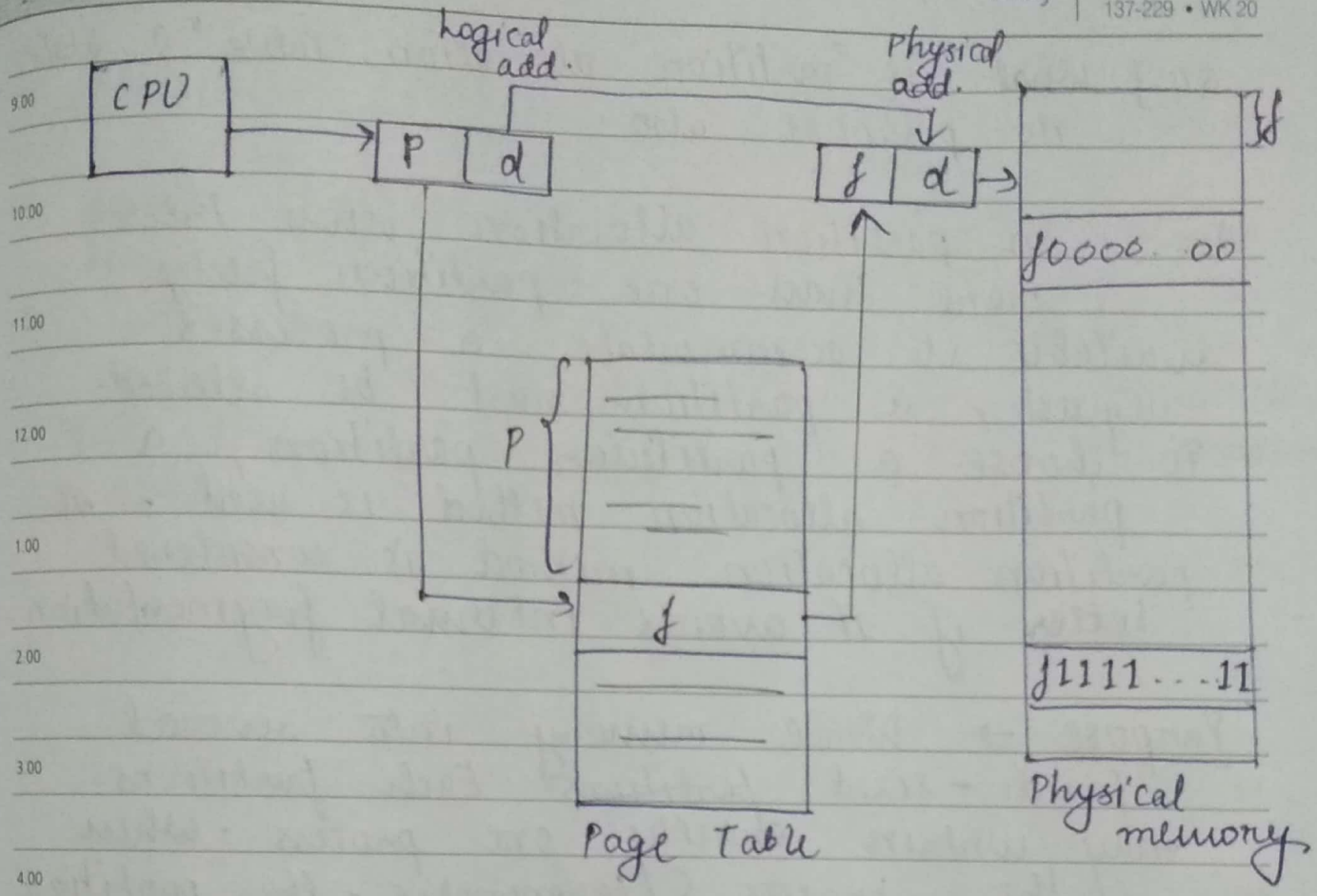
wk	M	T	W	T	F	S	S
18					1	2	3
19	4	5	6	7	8	9	10
20	11	12	13	14	15	16	17
21	18	19	20	21	22	23	24
22	25	26	27	28	29	30	31

Q5] Discuss the paging system for memory management in detail also give its advantages and disadvantages

Ans → Paging is a memory - management scheme that permits the physical address space of a process to be non-contiguous. Paging avoids the considerable problem of fitting the varying sized memory chunks onto the backing store, from which most of the previous memory management schemes suffered.

Physical memory is broken into fixed sized blocks called frames. Logical memory is also broken into blocks of the same size called pages.

When a process is to be executed, its pages are loaded into any available memory frames from the backing store. The backing store is divided into fixed sized as the memory frames. The hardware support for paging is :—



* Advantages & Disadvantages of Paging :-

i) Paging reduces external fragmentation, but still suffers from internal fragmentation.

ii) Paging is simple to implement and assumed as an efficient memory management technique.

Sunday 17

iii) Due to equal size of the pages and frames, swapping becomes very easy.

NOTES

iv) Page table requires extra memory space, so may not be good for a system having small RAM.

Q4] What is "partition allocation Table"? State its purpose also.

Ans → In partition allocation when there is more than one partition freely available to accomodate a processes request, a partition must be selected. To choose a particular partition, a partition allocation method is used. A partition allocation method is considered better if it avoids internal fragmentation.

Purpose → Divide memory into several fixed-sized partitions. Each partitions may contain exactly one process. When the process terminates, the partition become available for another process. The OS keeps a table indicating which parts of memory are available and which are occupied using a table.

Q5] State the "50 percent" rule in fragmentation?

Ans → Depending on the total amount of memory storage and the average process size, external fragmentation may be a minor or major problem.

NOTES

06 June 2020

wk	M	T	W	T	F	S	S
23	1	2	3	4	5	6	7
24	8	9	10	11	12	13	14
25	15	16	17	18	19	20	21
26	22	23	24	25	26	27	28
27	29	30					

2020 Tuesday May 19

140-226 • WK 21

9.00 Statistical analysis of first-fit, for instance, reveals that, even with some optimization, given N allocated blocks, another 0.5 N blocks will be lost due to fragmentation that is, one third of memory may be unusable. This property is known as the 50-percent rule.

10.00

11.00

12.00

1.00

2.00

3.00

4.00

5.00