MEMORY MANAGEMENT

An OS supporting multiprogramming system must required to resides all the processes assigned by multiple user in the high speed main memory to share the resources at any instant or time, required the main memory to be partitioned.

There are two possible way to partition main memory that includes :-

1. **STATIC OR FIXED PARTITIONING**
2. **DYNAMIC OR VARIABLE PARTITIONING**

STATIC OR FIXED PARTITIONING

In static or fixed partitioning the number of partition and the size of partition is made in the beginning and remain fixed thereafter . The description of each partition is made in the beginning ,is recorded in a table refer to as partition description table.
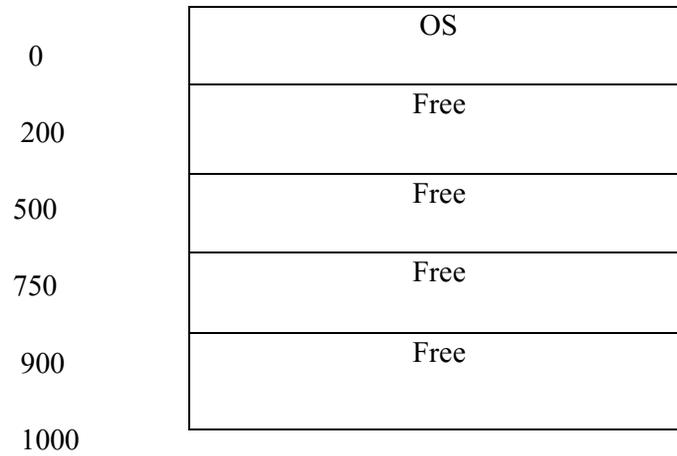
The partition description table is used by an operating system at later time to allocate free partition to the requesting process waiting in the ready queue.
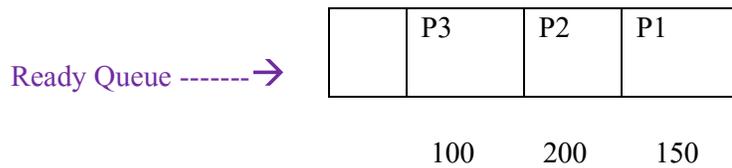
MEMORY MANAGEMENT IN STATIC PARTITIONING

PARTITION DESCRIPTION TABLE

BASE adddress	Size	Status
0	200	Allocated
200	300	Free
500	250	Free
750	150	Free
900	100	Free

MAIN MEMORY

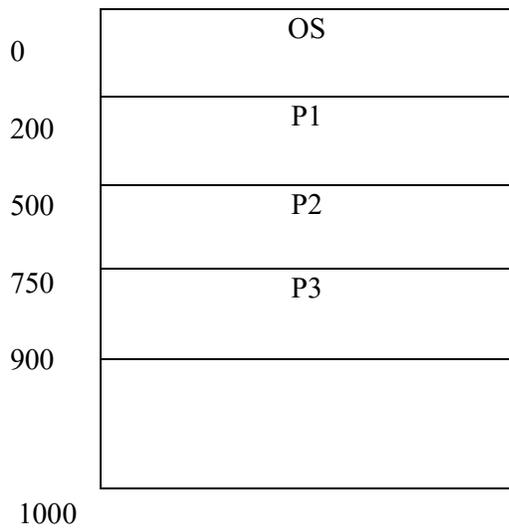|	
0	OS
200	Free
500	Free
750	Free
900	Free
1000	

Suppose an operating system made five partition of various size as given above in the beginning at time t1, following process are waiting in the ready queue to get free partition.

Ready Queue ------->

	P3	P2	P1
	100	200	150

Main Memory   PARTITION DESCRIPTION TABLE

Base address	Size	Status
0	200	Allocated
200	300	Allocated
500	250	Allocated
750	150	Allocated
900	100	Free

Main Memory diagram:

```
0      |        OS        |
200    |        P1        |
500    |        P2        |
750    |        P3        |
900    |                  |
1000
```

In the above method the allocation of partition in the memory is simple . But there were wastage of lots of memory ,to improve this we can use major two technique to save lots of memory for other processes.

These techniques are ----

A). FIRST FIT METHOD :-To allocate free partitioning to the requesting process waiting in the ready queue will use first fit method . In static partitioning when large partition is given to smaller process , it leads to waste lots of memory occurred internally refer to as Internal Fragmentation .

B). BEST FIT METHOD :- The best fit method is used to allocate free partition to the process waiting in the ready queue . In best fit method the OS (Memory Management) search the partition description table to find the equal or just greater free partition able to accommodate requesting process.

DYNAMIC OR VARIABLE PARTITIONING

           In dynamic partitioning the number of partition and size of each partition is made dynamically i.e,   at run time according to the requesting process waiting in the ready queue which changes at any instant/time and completely removed the Internal Fragmentation .

Memory management in dynamic partition :-

Consider a case i.e, at time t2 following process are waiting in ready queue to get a partition .
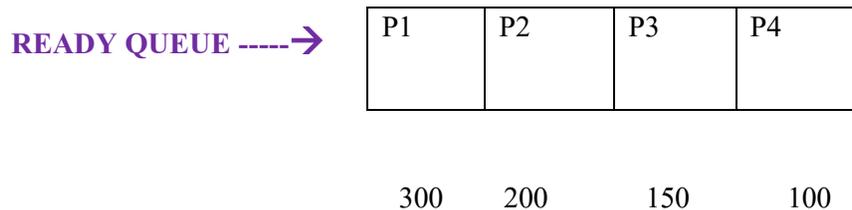
READY QUEUE -----→

P1	P2	P3	P4

        300   200   150   100

PARTITION DESCRIOPTION TABLE

Base address	Size	Status
0	200	Allocated
200	300	Allocated
500	200	Allocated
700	150	Allocated
850	100	Allocated
950	50	Free

MAIN   MEMORY

Address	
0	OS
200	P1
500	P2
700	P3
850	P4
950	
1000	

In the above figure all the process get space and free space is at last position in main memory .in this partition wastage of memory is external . in this partition we remove internal fragmentation .

ABOUT   FRAGMENTATION

An OS supporting multi-programming required several process to resides simultaneously in the high speed main memory to share resources between process at any instance /time , required the main memory to be partition.

The two possible way of partitioning in multiprogramming   environment includes static and dynamic . since the partitions were made in the beginning and remain fixed there after when a larger partition is allocated to smaller process , a lots of memory wastage occurred refer to as fragmentation .

In a static partitioning the wastage of memory occurred is known as internal Fragmentation.

In case of Dynamic partitioning the wastage of memory occurred is known as External Fragmentation.

BCA /PT 1
PAPER 2

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