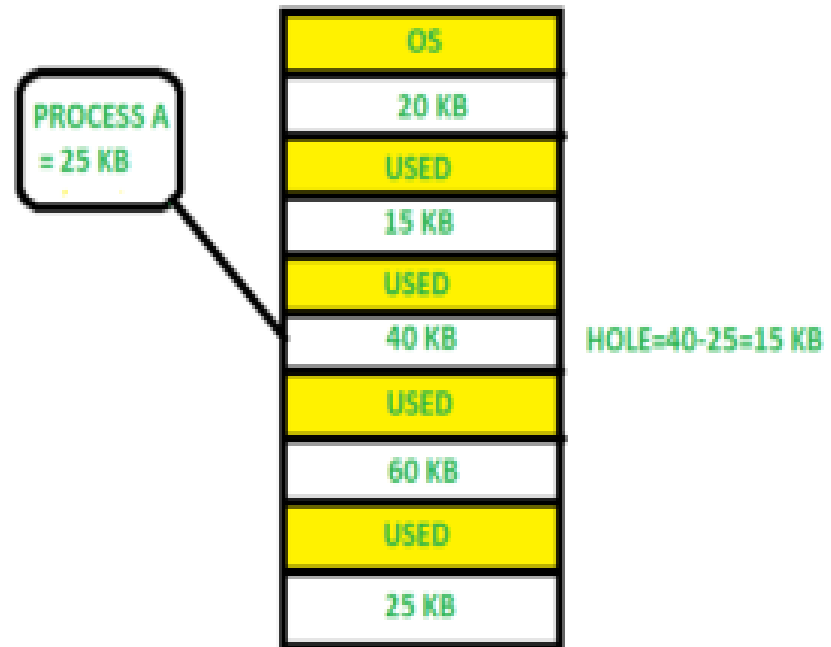# First Fit

- In the first fit, the partition is allocated which is the first sufficient block from the top of Main Memory.

- It scans memory from the beginning and chooses the first available block that is large enough. Thus it allocates the first hole that is large enough.

Implementation:

1- Input memory blocks with size and processes with size.

2- Initialize all memory blocks as free.

3- Start by picking each process and check if it can
   be assigned to current block.

4- If size-of-process <= size-of-block if yes then
   assign and check for next process.

5- If not then keep checking the further blocks.

First Fit

Job Number	Memory Requested
J1	20 K
J2	200 K
J3	500 K
J4	50 K

Memory location	Memory block size	Job number	Job size	Status	Internal fragmentation
10567	200 K	J1	20 K	Busy	180 K
30457	30 K			Free	30
300875	700 K	J2	200 K	Busy	500 K
809567	50 K	J4	50 K	Busy	None
Total available :	980 K	Total used :	270 K		710 K

First Fit

- **Advantage-**

- **Its advantage is that it is the fastest search as it searches only the first block i.e. enough to assign a process.**

- **Disdvantage-**

- **It may have problems of not allowing processes to take space even if it was possible to allocate.**

Best Fit

- Allocate the process to the partition which is the first smallest sufficient partition among the free available partition.

- It searches the entire list of holes to find the smallest hole whose size is greater than or equal to the size of the process.

Best Fit

Job Number	Memory Requested
J1	20 K
J2	200 K
J3	500 K
J4	50 K

Memory location	Memory block size	Job number	Job size	Status	Internal fragmentation
10567	30 K	J1	20 K	Busy	10 K
30457	50 K	J4	50 K	Busy	None
300875	200 K	J2	200 K	Busy	None
809567	700 K	J3	500 K	Busy	200 K
Total available :	980 K	Total used :	770 K		210 K

Best Fit

Advantages-

• Improved memory utilization, as it allocates the smallest block of memory that is sufficient to accommodate the memory request from the process.

• Additionally, Best-Fit can also help to reduce memory fragmentation, as it tends to allocate smaller blocks of memory that are less likely to become fragmented.

Disadvantages-

• Additionally, Best-Fit may also result in increased fragmentation, as it may leave smaller blocks of memory scattered throughout the memory space.

Best Fit

- **This method keeps the free/busy list in order by size – smallest to largest.**

- In this method, the operating system first searches the whole of the memory according to the size of the given job and allocates it to the closest-fitting free partition in the memory,

Worst-Fit

- In this allocation technique, the process traverses the whole memory and always search for the largest hole/partition, and then the process is placed in that hole/partition.

- It is a slow process because it has to traverse the entire memory to search the largest hole.

Worst-Fit

Process Number	Process Size
P1	30K
P2	100K
P3	45K

MEMORY LOCATION	MEMORY BLOCK SIZE	PROCESS NUMBER	PROCESS SIZE	STATUS	INTERNAL FRAGMENTATION
12345	50K	P3	45K	Busy	5K
45871	100K	P2	100K	Busy	None
1245	400K	P1	30K	Busy	370K
TOTAL AVAILABLE:	550K	TOTAL USED:	175K		375K