

Section A

Memory allocation techniques

Aim: To Write a C program to simulate the following contiguous memory allocation techniques namely, Best-fit, First-fit and Worst-fit.

Description:

One of the simplest methods for memory allocation is to divide memory into several fixed-sized partitions. Each partition may contain exactly one process. In this multiple-partition method, when a partition is free, a process is selected from the input queue and is loaded into the free partition. When the process terminates, the partition becomes available for another process. The operating system keeps a table indicating which parts of memory are available and which are occupied. Finally, when a process arrives and needs memory, a memory section large enough for this process is provided. When it is time to load or swap a process into main memory, and if there is more than one free block of memory of sufficient size, then the operating system must decide which free block to allocate.

- a) Best-fit strategy chooses the block that is closest in size to the request.



```

Microsoft Visual Studio Debug Console

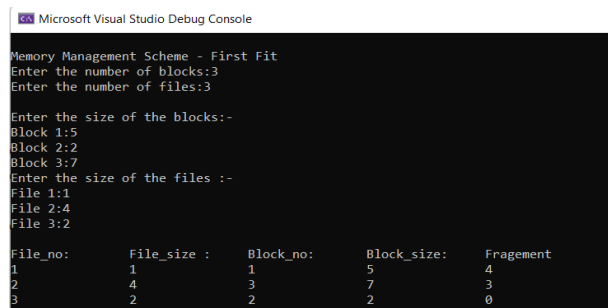
Enter the number of blocks:3
Enter the number of files:3

Enter the size of the blocks:-
Block 1:5
Block 2:2
Block 3:7
Enter the size of the files :-
File 1:1
File 2:4
File 3:2

File No File Size      Block No   BlockSize   Fragment
1         1         2         2         1
2         4         1         5         1
3         2         3         7         5
  
```

Best-Fit Sample run

- b) First-fit chooses the first available block that is large enough.



```

Microsoft Visual Studio Debug Console

Memory Management Scheme - First Fit
Enter the number of blocks:3
Enter the number of files:3

Enter the size of the blocks:-
Block 1:5
Block 2:2
Block 3:7
Enter the size of the files :-
File 1:1
File 2:4
File 3:2

File_no:      File_size :      Block_no:      Block_size:      Fragement
1             1             1             5             4
2             4             3             7             3
3             2             2             2             0
  
```

First-Fit Sample run

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- c) Worst-fit chooses the largest available block.

```
Microsoft Visual Studio Debug Console

Memory Management Scheme - Worst Fit
Enter the number of blocks:3
Enter the number of files:3

Enter the size of the blocks:-
Block 1:5
Block 2:2
Block 3:7
Enter the size of the files :-
File 1:1
File 2:4
File 3:2

File_no:      File_size:      Block_no:      Block_size:      Fragement
1             1             3             7             6
2             4             1             5             1
3             2             2             2             0
```

Worst-Fit Sample run