**S.Y.B.Tech**

**Computer Engineering**

**Lab. : CE 2207 Operating Systems Laboratory (OSL)**

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| **Assignment #5: (Group-‘B3’)**   |  | | --- | |  | | Title: Write a Java program to implement following memory allocation strategies: First Fit, Best Fit and Worst Fit. | | |

**Objective:** Implementation of memory allocation strategies.

**Theory:**

**What is Memory Management?**

**Memory Management** is the process of controlling and coordinating computer memory, assigning portions known as blocks to various running programs to optimize the overall performance of the system.

It is the most important function of an operating system that manages primary memory. It helps processes to move back and forward between the main memory and execution disk. It helps OS to keep track of every memory location, irrespective of whether it is allocated to some process or it remains free

## Memory Management Techniques: Some most crucial memory management techniques are as follows:

### Single Contiguous Allocation

It is the easiest memory management technique. In this method, all types of computer's memory except a small portion which is reserved for the OS is available for one application. For example, MS-DOS operating system allocates memory in this way. An embedded system also runs on a single application.

### Partitioned Allocation

It divides primary memory into various memory partitions, which are mostly contiguous areas of memory. Every partition stores all the information for a specific task or job. This method consists of allotting a partition to a job when it starts & unallocated when it ends.

**What is Memory allocation?**

Memory allocation is a process by which computer programs are assigned memory or space.

Here, main memory is divided into two types of partitions

1. **Low Memory** - Operating system resides in this type of memory.
2. **High Memory**- User processes are held in high memory.

**Partition Allocation**

Memory is divided into different blocks or partitions. Each process is allocated according to the requirement. Partition allocation is an ideal method to avoid internal fragmentation.

Below are the various partition allocation schemes:

* **First Fit**: In this type fit, the partition is allocated, which is the first sufficient block from the beginning of the main memory.
* **Best Fit:**It allocates the process to the partition that is the first smallest partition among the free partitions.
* **Worst Fit:**It allocates the process to thepartition, which is the largest sufficient freely available partition in the main memory.

**Sample Output:**

Enter no. of memory blocks available :5

Enter the block id : 1

Enter the size of memory block 1 in KB :100

Enter the block id :2

Enter the size of memory block 2 in KB :500

Enter the block id: 3

Enter the size of memory block 3 in KB :200

Enter the block id: 4

Enter the size of memory block 4 in KB :300

Enter the block id: 5

Enter the size of memory block 5 in KB :600

Enter no. of processes available:4

Enter the process id:1

Enter the size of process 1 in KB:212

Enter the process id:2

Enter the size of process 2 in KB:417

Enter the process id:3

Enter the size of process 3 in KB:112

Enter the process id:4

Enter the size of process 4 in KB:426

1]FIRST FIT STRATEGY

2]BEST FIT STRATEGY

3]WORST FIT STRATEGY

4]EXIT

Enter your option : 1

Process 1 of size 212 KB is allocated to memory block 2 of size 500 KB

Process 2 of size 417 KB is allocated to memory block 5 of size 600 KB

Process 3 of size 112 KB is allocated to memory block 3 of size 200 KB

Process 4 is not allocated to any memory block

1]FIRST FIT STRATEGY

2]BEST FIT STRATEGY

3]WORST FIT STRATEGY

4]EXIT

Enter your option : 2

Process 1 of size 212 KB is allocated to memory block 3 of size 300 KB

Process 2 of size 417 KB is allocated to memory block 4 of size 500 KB

Process 3 of size 112 KB is allocated to memory block 2 of size 200 KB

Process 4 of size 426 KB is allocated to memory block 5 of size 600 KB

1]FIRST FIT STRATEGY

2]BEST FIT STRATEGY

3]WORST FIT STRATEGY

4]EXIT

Enter your option : 3

Process 1 of size 212 KB is allocated to memory block 1 of size 600 KB

Process 2 of size 417 KB is allocated to memory block 2 of size 500 KB

Process 3 of size 112 KB is allocated to memory block 3 of size 300 KB

Process 4 is not allocated to any memory block

1]FIRST FIT STRATEGY

2]BEST FIT STRATEGY

3]WORST FIT STRATEGY

4]EXIT

Enter your option: 4

EXECUTION COMPLETED!!