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Vishwakarma Institute of Technology, Pune-37

(Anautonomous Institute of Savitribai Phule Pune University)

Department of Computer Engineering

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- **Memory Management requirements, Memory Partitioning: Fixed, Dynamic Partitioning**

```
#include <stdbool.h>
#include <stdio.h>
#include <stdlib.h>

#define MEMORY_SIZE 1024
#define FIXED_PARTITION_SIZE 256

// Structure to represent a memory block
typedef struct MemoryBlock {
  int size;
  bool allocated;
} MemoryBlock;

// Fixed partitioning function
void fixedPartitioning() {
  MemoryBlock memory[MEMORY_SIZE / FIXED_PARTITION_SIZE];

  // Initialize memory blocks
  for (int i = 0; i < MEMORY_SIZE / FIXED_PARTITION_SIZE; ++i) {
    memory[i].size = FIXED_PARTITION_SIZE;
    memory[i].allocated = false;
  }
```

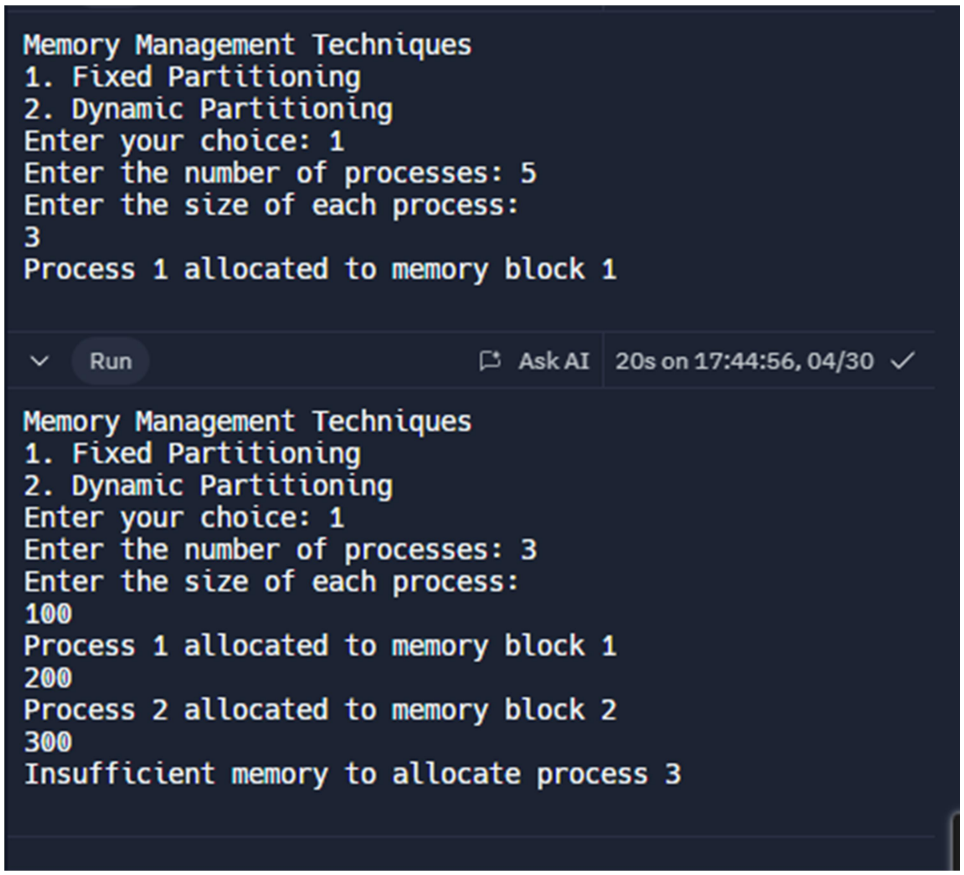
```
  // Allocate memory
  int num_processes, process_size;
  printf("Enter the number of processes: ");
  scanf("%d", &num_processes);
  printf("Enter the size of each process:\n");
  for (int i = 0; i < num_processes; ++i) {
    scanf("%d", &process_size);
    bool allocated = false;
    for (int j = 0; j < MEMORY_SIZE / FIXED_PARTITION_SIZE; ++j) {
      if (!memory[j].allocated && memory[j].size >= process_size) {
        memory[j].allocated = true;
        allocated = true;
        printf("Process %d allocated to memory block %d\n", i + 1, j + 1);
        break;
      }
    }
    if (!allocated) {
      printf("Insufficient memory to allocate process %d\n", i + 1);
    }
  }
}
```

```
// Dynamic partitioning function
void dynamicPartitioning() {
  int memory[MEMORY_SIZE];
  int num_processes, process_size;

  // Initialize memory
  for (int i = 0; i < MEMORY_SIZE; ++i) {
    memory[i] = -1; // -1 indicates unallocated memory
  }

  // Allocate memory
  printf("Enter the number of processes: ");
  scanf("%d", &num_processes);
  printf("Enter the size of each process:\n");
  for (int i = 0; i < num_processes; ++i) {
    scanf("%d", &process_size);
    bool allocated = false;
    for (int j = 0; j < MEMORY_SIZE; ++j) {
      if (memory[j] == -1) { // Find a free block
        int k;
        for (k = j; k < j + process_size; ++k) {
          if (memory[k] != -1) {
            break; // Block is too small, move to next free block
```

```
        }
      }
      if (k ==
        j + process_size) { // Allocate memory if the block is large enough
       for (int l = j; l < j + process_size; ++l) {
        memory[l] = i; // Allocate process ID to memory block
       }
       printf("Process %d allocated to memory starting from block %d\n",
            i + 1, j);
       allocated = true;
       break;
      }
     }
   }
   if (!allocated) {
    printf("Insufficient memory to allocate process %d\n", i + 1);
   }
  }
}

int main() {
  int choice;
```

```
// Display menu
printf("Memory Management Techniques\n");
printf("1. Fixed Partitioning\n");
printf("2. Dynamic Partitioning\n");
printf("Enter your choice: ");
scanf("%d", &choice);

// Perform selected operation
switch (choice) {
case 1:
  fixedPartitioning();
  break;
case 2:
  dynamicPartitioning();
  break;
default:
  printf("Invalid choice\n");
}

return 0;
```

}


Memory Management Techniques
1. Fixed Partitioning
2. Dynamic Partitioning
Enter your choice: 1
Enter the number of processes: 5
Enter the size of each process:
3
Process 1 allocated to memory block 1
Run
Ask AI
20s on 17:44:56, 04/30
Memory Management Techniques
1. Fixed Partitioning
2. Dynamic Partitioning
Enter your choice: 1
Enter the number of processes: 3
Enter the size of each process:
100
Process 1 allocated to memory block 1
200
Process 2 allocated to memory block 2
300
Insufficient memory to allocate process 3