King Saud University
College of Computer and Information Sciences
Information Technology Department

كلية علوم الحاسب والمعلومات
قسم تقنية المعلومات

CSC227: Operating System

Programming Assignment 2

Assignment Report

Section#:52586 Group#: 4	
Name	**ID**
Ghaida Alhussain (Leader)	**444201213**
Fajer Alamro	**444200800**
Sara Alhowaimel	**444200462**
Deem Aljarba	**444200523**

Supervised by: Dr.Amani Alahmadi

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Task distribution:

Name	Task
Ghaida Alhussain	MemoryInitialization
Fajer Alamro	MemoryManager
Sara Alhowaimel	SimulatorUI
Deem Aljarba	SimulatorUI

Screenshots:

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Test Case #1: Using Best-Fit Strategy

Added processes with their size:

1- p1 60
2- p2 150
3- p3 250

```
Enter the total number of blocks: 4
Enter the size of each block in KB: 300 200 100 400
Enter allocation strategy (1 for first-fit, 2 for best-fit, 3 for worst-fit): 2
Memory blocks are created…
Memory blocks:
=============================================
Block#      size                start-end     status
=============================================
Block0      300                 0-299      free
Block1      200                 300-499      free
Block2      100                 500-599      free
Block3      400                 600-999      free
=============================================
```

Initial blocks in memory

```
---------------------------------------------
Enter your choice: 1
Enter the process ID and size of process: p1 60
p1 Allocated at address 500, and the internal fragmentation is 40
=============================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
=============================================
Enter your choice: 1
Enter the process ID and size of process: p2 150
p2 Allocated at address 300, and the internal fragmentation is 50
=============================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
=============================================
Enter your choice: 1
Enter the process ID and size of process: p3 250
p3 Allocated at address 0, and the internal fragmentation is 50
=============================================
```

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Adding processes

```
-------------------------------------------
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
===========================================
Enter your choice: 3
Memory blocks:
=============================================================
Block#     size          start-end     status         ProcessID  InternalFragmentation
=============================================================
Block0   300       0-299          allocated      p3         50
Block1   200       300-499        allocated      p2         50
Block2   100       500-599        allocated      p1         40
Block3   400       600-999        free           Null       0
=============================================================
-------------------------------------------
```

Memory state

```
===========================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
===========================================
Enter your choice: 2
Enter the process ID to be released from the memory: p3
Process p3 deallocated successfully.
===========================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
===========================================
Enter your choice: 3
Memory blocks:
=============================================================
Block#     size          start-end     status         ProcessID  InternalFragmentation
=============================================================
Block0   300       0-299          free           Null       0
Block1   200       300-499        allocated      p2         50
Block2   100       500-599        allocated      p1         40
Block3   400       600-999        free           Null       0
=============================================================
```

Memory state after De-allocating p3

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Test Case #2: Using First-Fit Strategy

Same previous processes

```
==========================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
==========================================
Enter your choice: 3
Memory blocks:
============================================================
Block#     size          start-end     status          ProcessID  InternalFragmentation
============================================================
Block0   300        0-299          allocated       p1         240
Block1   200        300-499        allocated       p2         50
Block2   100        500-599        free            Null       0
Block3   400        600-999        allocated       p3         150
============================================================
```

Memory state

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Case #3: Using Worst-Fit Strategy

Same previous processes

```
==============================================
Enter your choice: 1
Enter the process ID and size of process: p2 150
p2 Allocated at address 0, and the internal fragmentation is 150
==============================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
==============================================
Enter your choice: 1
Enter the process ID and size of process: p3 250
Error: No suitable block available for allocation.
==============================================
1) Allocates memory blocks
2) De-allocates memory blocks
3) Print report about the current state of memory and internal Fragmentation
4) Exit
==============================================
Enter your choice: 3
Memory blocks:
============================================================
Block#     size          start-end     status         ProcessID  InternalFragmentation
============================================================
Block0   300       0-299          allocated      p2        150
Block1   200       300-499        free           Null      0
Block2   100       500-599        free           Null      0
Block3   400       600-999        allocated      p1        340
```

Memory state

Note: We couldn't allocate P3 because blocks 0 and 3 are already allocated, while blocks 1 and 2 are too small to fit it.