Faculty of Computing and Information Technology (FCIT)
Department of Computing Indus University, Karachi

NAME OF STUDENT: AHMED ALI ANSARI ID No: 1402-2020

ASSIGNMENT

Fall 2022

Department / Faculty	Program	Semester	Course Title	Instructor	Issue Date	Due Date	Faculty Signature	Total Marks
FCIT	BS Computer science	5th, OfferNo 65755	**Operating System (Lab)**	Aadrish Pirzado	15/12/2022	22/12/2022		**5**

Instructions

1. This paper contains **1 Questions**. Attempt all questions.
2. This assignment should be completed within assigned time, after the due date, assignment will not be accepted.
3. Please ensure that no part of your assignment should be copied from any other source without acknowledgement of the source and proper referencing.(w3school).
4. Please note that copy-paste is a serious nature of academic dishonesty, it is called "Plagiarism" and the penalties are attached to being found guilty of committing such offences.
5. It is allow using lecture notes, books and other sources, however needing to refer/cite properly, Reference list must be given at end of the assignment.
6. This assignment should be submitted in **PDF** file for this purpose first take image of all hand written pages and then merge using Smartphone app (from PC/Laptop put all images in word file and save as **PDF**) including assignment paper in the start of submission.
7. Assignment can be compressed or break in two parts if file size is larger than uploading limit.
8. The font size should 12 and Times New Roman should be used. All figures and illustrations should be properly titled or numbered on the left side, below.
9. Also ensure that no part of your assignment has been written by any other person, except to the extent of collaboration and /or group work.

This table is for official use; do not write anything on it.

CLOs	CLO_3		Total
Question Number	**5**		
Student's Score			
Maximum Score	**5**		**5**

This paper has a total of **2 pages** including this title page

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Operating System

[Questions-1 is related to CLO # 4:] PLO-3 (C3 – Design & Development Solution) CLO-3: Report the outcome of an experiment/task in standard format.

Q1. (A) Write a program that simulates process creation requests in a computer and observe the fragmentation due to different memory partitioning methods and allocation strategies (first-fit, best-fit, and next-fit, worst-fit).

(The process creation requests simulator should create processes of random durations and sizes, and there should be to provision to view the fragmentation at different instances.)

Note: • Your assignment must have contained 300 words.

• A zero-tolerance policy will be regulated in case of plagiarism. • Perform tasks individually. • Use this proper format for assignments rather than new document.

Code for next fit:

```
# Python3 program for next fit
# memory management algorithm

# Function to allocate memory to
# blocks as per Next fit algorithm
def NextFit(blockSize, m, processSize, n):

    # Stores block id of the block
    # allocated to a process

    # Initially no block is assigned
    # to any process
    allocation = [-1] * n
    j = 0
    t = m-1
    # pick each process and find suitable blocks
    # according to its size ad assign to it
    for i in range(n):

        # Do not start from beginning
        while j < m:
            if blockSize[j] >= processSize[i]:
```

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```
                # allocate block j to p[i] process
                allocation[i] = j

                # Reduce available memory in this block.
                blockSize[j] -= processSize[i]

                # sets a new end point
                t = (j - 1) % m
                break
            if t == j:
                # sets a new end point
                t = (j - 1) % m
                # breaks the loop after going through all memory block
                break

            # mod m will help in traversing the
            # blocks from starting block after
            # we reach the end.
            j = (j + 1) % m

    print("Process No. Process Size Block no.")

    for i in range(n):
        print("\t", i + 1, "\t\t\t", processSize[i],end = "\t\t\t")
        if allocation[i] != -1:
            print(allocation[i] + 1)
        else:
            print("Not Allocated")

# Driver Code
if __name__ == '__main__':
    blockSize = [5, 10, 20]
    processSize = [10, 20, 5]
    m = len(blockSize)
    n = len(processSize)

    NextFit(blockSize, m, processSize, n)
```

Ouput:

```
PS F:\COMPUTER SCIENCE\SEMESTER 5\Exercises quizes hands on code pres assignments\Operat
al/Microsoft/WindowsApps/python3.10.exe "f:/COMPUTER SCIENCE/SEMESTER 5/Exercises quizes
ile/lab 9 next fit.py"
Process No. Process Size Block no.
         1                       10                      2
         2                       20                      3
         3                       5                       1
```

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Code for best fit:

```
# Python3 implementation of Best - Fit algorithm

# Function to allocate memory to blocks
# as per Best fit algorithm
def bestFit(blockSize, m, processSize, n):

    # Stores block id of the block
    # allocated to a process
    allocation = [-1] * n

    # pick each process and find suitable
    # blocks according to its size ad
    # assign to it
    for i in range(n):

        # Find the best fit block for
        # current process
        bestIdx = -1
        for j in range(m):
            if blockSize[j] >= processSize[i]:
                if bestIdx == -1:
                    bestIdx = j
                elif blockSize[bestIdx] > blockSize[j]:
                    bestIdx = j

        # If we could find a block for
        # current process
        if bestIdx != -1:

            # allocate block j to p[i] process
            allocation[i] = bestIdx

            # Reduce available memory in this block.
            blockSize[bestIdx] -= processSize[i]

    print("Process No. Process Size  Block no.")
    for i in range(n):
        print(i + 1, "       ", processSize[i],
                                end = "      ")
        if allocation[i] != -1:
            print(allocation[i] + 1)
        else:
            print("Not Allocated")

# Driver code
if __name__ == '__main__':
    blockSize = [100, 500, 200, 300, 600]
    processSize = [212, 417, 112, 426]
```

```
    m = len(blockSize)
    n = len(processSize)

    bestFit(blockSize, m, processSize, n)
```

Output:

```
PS F:\COMPUTER SCIENCE\SEMESTER 5\Exercises quizes hands on code p
al/Microsoft/WindowsApps/python3.10.exe "f:/COMPUTER SCIENCE/SEMES
ile/lab 9 best fit.py"
Process No. Process Size        Block no.
1               212             4
2               211             2
3               112             3
4               333             5
```

Code for wrost fit:

```
# Python3 implementation of worst - Fit algorithm

# Function to allocate memory to blocks as
# per worst fit algorithm
def worstFit(blockSize, m, processSize, n):

    # Stores block id of the block
    # allocated to a process

    # Initially no block is assigned
    # to any process
    allocation = [-1] * n

    # pick each process and find suitable blocks
    # according to its size ad assign to it
    for i in range(n):

        # Find the best fit block for
        # current process
        wstIdx = -1
        for j in range(m):
            if blockSize[j] >= processSize[i]:
                if wstIdx == -1:
                    wstIdx = j
                elif blockSize[wstIdx] < blockSize[j]:
                    wstIdx = j

        # If we could find a block for
        # current process
        if wstIdx != -1:
```

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```
            # allocate block j to p[i] process
            allocation[i] = wstIdx

            # Reduce available memory in this block.
            blockSize[wstIdx] -= processSize[i]

    print("Process No. Process Size Block no.")
    for i in range(n):
        print(i + 1, "       ",
            processSize[i], end = "  ")
        if allocation[i] != -1:
            print(allocation[i] + 1)
        else:
            print("Not Allocated")

# Driver code
if __name__ == '__main__':
    blockSize = [100, 500, 200, 300, 600]
    processSize = [212, 417, 112, 426]
    m = len(blockSize)
    n = len(processSize)

    worstFit(blockSize, m, processSize, n)
```

Output:

```
PS F:\COMPUTER SCIENCE\SEMESTER 5\Exercises quizes hands on cod
al/Microsoft/WindowsApps/python3.10.exe "f:/COMPUTER SCIENCE/SE
ile/lab 9 wrost fit.py"
Process No. Process Size Block no.
1               212    5
2               417    2
3               112    5
4               426    Not Allocated
```