Faculty of computers and Information
Cairo University
Operating System 1

Assignment 3: Memory management

(6 marks)

Deadline & Submission:

1. The Assignment is a group of min 3, max 4 students.
2. All team members must be from the same group.
3. One team member only should submit the compressed group solution as zip file
   Ex: A3_ID1_ID2_ID3_ID4_Group.zip
4. The deadline for submitting the solution is 23 Dec @11:59 PM.
5. Submissions should be in Java.

Grading Criteria

Class Partition/ Class Process	0.5
First Fit	1.5
Best Fit	1.5
Worst Fit	1.5
Compaction	1

You will develop a memory allocation simulator to allocate variable-sized partitions of the memory to a given sequence of processes requests. Apply different allocation policies:

1. First-Fit policy.
2. Best-Fit policy.
3. Worst-Fit policy.

- Add compaction (as option for the user): in compaction you shuffle the memory contents so as to place all free memory together in one large block.

Input will be as follows:

- Number of partition
- Partition name and its size.
- Number of process requests.
- Process name and its size.
- Selected policy by the user.

Sample input:

Enter number of partition:
6
Enter number of partition:
Partition0 90
Enter number of partition:
Partition1 20
Enter number of partition:
Partition2 5
Enter number of partition:
Partition3 30
Enter number of partition:
Partition4 120
Enter number of partition:
Partition5 80

Enter number of processes:
4
Process name and its size:
Process1 15
Process name and its size:
Process2 90
Process name and its size:
Process3 30
Process name and its size:
Process4 100

Select the policy you want to apply:
1. First fit
2. Worst fit
3. Best fit

Select policy:
1

Partition 0 (15 KB) => Process 1
Partition 6 (30 KB) => Process 3
Partition 8 (45 KB) => External fragment
Partition 1 (20 KB) => External fragment
Partition 2 (5 KB) => External fragment
Partition 3 (30 KB) => External fragment
Partition 4 (90 KB) => Process 2
Partition 7 (30 KB) => External fragment
Partition 5 (80 KB) => External fragment

Process 4 can not be allocated

Do you want to compact? 1.yes 2.no
1

Partition 0 (15 KB) => Process 1
Partition 6 (30 KB) => Process 3
Partition 4 (90 KB) => Process 2
Partition 9 (100 KB) => Process 4
Partition 10 (110 KB) => External fragment

Select policy:
2

Partition 0 (90 KB) => Process 2
Partition 1 (15 KB) => Process 1
Partition 6 (5 KB) => External fragment
Partition 2 (5 KB) => External fragment
Partition 3 (30 KB) => Process 3
Partition 4 (100 KB) => Process 4
Partition 7 (20 KB) => External fragment
Partition 5 (80 KB) => External fragment

Do you want to compact? 1.yes 2.no
1

Partition 0 (90 KB) => Process 2
Partition 1 (15 KB) => Process 1
Partition 3 (30 KB) => Process 3
Partition 4 (100 KB) => Process 4
Partition 8 (110 KB) => External fragment

Select policy:
3

Partition 0 (30 KB) => Process 3
Partition 8 (60 KB) => External fragment
Partition 1 (20 KB) => External fragment
Partition 2 (5 KB) => External fragment
Partition 3 (30 KB) => External fragment
Partition 4 (15 KB) => Process 1
Partition 6 (90 KB) => Process 2
Partition 7 (15 KB) => External fragment
Partition 5 (80 KB) => External fragment

Process 4 can not be allocated

Do you want to compact? 1.yes 2.no
2