

CSC227: Operating Systems
2nd Semester 1445
Section:52988
Group:1

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Input/output screen shots

Case 1:

In this case there are 4 processes, 3 of them added to Q1 with different CPU burst times (P1 burst time = 5 higher than the time quantum, P3 burst time = 3 equal to time quantum, P4 burst time = 2 less than the time quantum). And process P2 added to Q2 with burst time = 4, when executing P2 after finishing processes in Q1, at time 10 a new process is added to Q1 (P4) so a fixed preemptive priority scheduling is implemented and P2 will be back to the ready queue and P4 will be executed.

```
1. Enter processes
2. Display scheduling report
3. Exit
Enter your choice: 1
Enter the total number of processes: 4
Enter process information 1
Priority (1 or 2): 1
Arrival time: 0
CPU burst time: 5
Enter process information 2
Priority (1 or 2): 2
Arrival time: 0
CPU burst time: 4
Enter process information 3
Priority (1 or 2): 1
Arrival time: 2
CPU burst time: 3
Enter process information 4
Priority (1 or 2): 1
Arrival time: 10
CPU burst time: 2
```

[Figure1] User input in Case 1 Entering 4 process, Three of them in Q1 and one in Q2.

```
1. Enter processes
2. Display scheduling report
3. Exit
Enter your choice: 2
Scheduling order :
[ P1 | P3 | P1 | P2 | P4 | P2 ]
=====
info :
Process ID: P3, Priority: 1, Arrival Time: 2, CPU Burst: 3, Start Time: 3, Termination Time: 6, Turnaround Time: 4, Waiting Time: 1, Response Time: 1
-----
Process ID: P1, Priority: 1, Arrival Time: 0, CPU Burst: 5, Start Time: 0, Termination Time: 8, Turnaround Time: 8, Waiting Time: 3, Response Time: 0
-----
Process ID: P4, Priority: 1, Arrival Time: 10, CPU Burst: 2, Start Time: 10, Termination Time: 12, Turnaround Time: 2, Waiting Time: 0, Response Time: 0
-----
Process ID: P2, Priority: 2, Arrival Time: 0, CPU Burst: 4, Start Time: 8, Termination Time: 14, Turnaround Time: 14, Waiting Time: 10, Response Time: 8
-----
Average Turnaround Time: 7.0
Average Waiting Time: 3.5
Average Response Time: 2.25
Different Scheduling Criteria:
Scheduling by Turnaround Time:
P4 P3 P1 P2
Scheduling by Waiting Time:
P4 P3 P1 P2
Scheduling by Response Time:
P4 P1 P3 P2
```

[Figure2] Scheduling Report for Case 1.

Case 2:

In this case there are 3 processes, all of them are added to Q2 with different CPU burst times (P1 burst time = 5, P2 burst time = 3, P3 burst time = 2). At time 0 there was only process P1 and when P2 (has lower CPU burst than P1) is added P1 is still executing since the algorithm is non-preemptive, and when P3 was added it came ahead of P2 in the queue.

```
1. Enter processes
2. Display scheduling report
3. Exit
Enter your choice: 1
Enter the total number of processes: 3
Enter process information 1
Priority (1 or 2): 2
Arrival time: 0
CPU burst time: 5
Enter process information 2
Priority (1 or 2): 2
Arrival time: 2
CPU burst time: 3
Enter process information 3
Priority (1 or 2): 2
Arrival time: 5
CPU burst time: 2
1. Enter processes
2. Display scheduling report
3. Exit
```

[Figure3] User input in Case 2 Entering 3 process, All of them in Q2.

```
1. Enter processes
2. Display scheduling report
3. Exit
Enter your choice: 2
Scheduling order :
[ P1 | P3 | P2 ]
=====
info :
Process ID: P1, Priority: 2, Arrival Time: 0, CPU Burst: 5, Start Time: 0, Termination Time: 5, Turnaround Time: 5, Waiting Time: 0, Response Time: 0
-----
Process ID: P3, Priority: 2, Arrival Time: 5, CPU Burst: 2, Start Time: 5, Termination Time: 7, Turnaround Time: 2, Waiting Time: 0, Response Time: 0
-----
Process ID: P2, Priority: 2, Arrival Time: 2, CPU Burst: 3, Start Time: 7, Termination Time: 10, Turnaround Time: 8, Waiting Time: 5, Response Time: 5
-----
Average Turnaround Time: 5.0
Average Waiting Time: 1.6666666666666667
Average Response Time: 1.6666666666666667
Different Scheduling Criteria:
Scheduling by Turnaround Time:
P3 P1 P2
Scheduling by Waiting Time:
P3 P1 P2
Scheduling by Response Time:
P3 P1 P2
```

[Figure4] Scheduling Report for Case 2.

Case 3:

In this case there are 4 processes, 2 of them added to Q1 with different CPU burst times (P1 burst time = 8 higher than the time quantum, P2 burst time = 2 less than time quantum). And process P3 and P4 are added to Q2 with burst times = 3, 2. When process P1 executed the first 3 ms and went back to the queue P2 was Arriving at the same time, Preemption was implemented to make P2 have higher priority.

```
1. Enter processes
2. Display scheduling report
3. Exit
Enter your choice: 1
Enter the total number of processes: 4
Enter process information 1
Priority (1 or 2): 1
Arrival time: 0
CPU burst time: 8
Enter process information 2
Priority (1 or 2): 1
Arrival time: 3
CPU burst time: 2
Enter process information 3
Priority (1 or 2): 2
Arrival time: 0
CPU burst time: 3
Enter process information 4
Priority (1 or 2): 2
Arrival time: 8
CPU burst time: 2
```

[Figure5] User input in Case 3 Entering 4 process, two added in Q1 and two in Q2.

```
1. Enter processes
2. Display scheduling report
3. Exit
Enter your choice: 2
Scheduling order :
[ P1 | P2 | P1 | P1 | P4 | P3 ]
=====
Info :
Process ID: P2, Priority: 1, Arrival Time: 3, CPU Burst: 2, Start Time: 3, Termination Time: 5, Turnaround Time: 2, Waiting Time: 0, Response Time: 0
-----
Process ID: P1, Priority: 1, Arrival Time: 0, CPU Burst: 8, Start Time: 0, Termination Time: 10, Turnaround Time: 10, Waiting Time: 2, Response Time: 0
-----
Process ID: P4, Priority: 2, Arrival Time: 8, CPU Burst: 2, Start Time: 10, Termination Time: 12, Turnaround Time: 4, Waiting Time: 2, Response Time: 2
-----
Process ID: P3, Priority: 2, Arrival Time: 0, CPU Burst: 3, Start Time: 12, Termination Time: 15, Turnaround Time: 15, Waiting Time: 12, Response Time: 12
-----
Average Turnaround Time: 7.75
Average Waiting Time: 4.0
Average Response Time: 3.5
Different Scheduling Criteria:
Scheduling by Turnaround Time:
P2 P4 P1 P3
Scheduling by Waiting Time:
P2 P4 P1 P3
Scheduling by Response Time:
P2 P1 P4 P3
```

[Figure6] Scheduling Report for Case 3.



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Report screen shots

```
Report
File Edit View

[ P1 | P3 | P1 | P2 | P4 | P2 ]
Process ID: P3, Priority: 1, Arrival Time: 2, CPU Burst: 3, Start Time: 3, Termination Time: 6, Turnaround Time: 4, Waiting Time: 1, Response Time: 1
-----
Process ID: P1, Priority: 1, Arrival Time: 0, CPU Burst: 5, Start Time: 0, Termination Time: 8, Turnaround Time: 8, Waiting Time: 3, Response Time: 0
-----
Process ID: P4, Priority: 1, Arrival Time: 10, CPU Burst: 2, Start Time: 10, Termination Time: 12, Turnaround Time: 2, Waiting Time: 0, Response Time: 0
-----
Process ID: P2, Priority: 2, Arrival Time: 0, CPU Burst: 4, Start Time: 8, Termination Time: 14, Turnaround Time: 14, Waiting Time: 10, Response Time: 8
-----
Average Turnaround Time: 7.0
Average Waiting Time: 3.5
Average Response Time: 2.25

[ P1 | P3 | P2 ]
Process ID: P1, Priority: 2, Arrival Time: 0, CPU Burst: 5, Start Time: 0, Termination Time: 5, Turnaround Time: 5, Waiting Time: 0, Response Time: 0
-----
Process ID: P3, Priority: 2, Arrival Time: 5, CPU Burst: 2, Start Time: 5, Termination Time: 7, Turnaround Time: 2, Waiting Time: 0, Response Time: 0
-----
Process ID: P2, Priority: 2, Arrival Time: 2, CPU Burst: 3, Start Time: 7, Termination Time: 10, Turnaround Time: 8, Waiting Time: 5, Response Time: 5
-----
Average Turnaround Time: 5.0
Average Waiting Time: 1.6666666666666667
Average Response Time: 1.6666666666666667

[ P1 | P2 | P1 | P1 | P4 | P3 ]
Process ID: P2, Priority: 1, Arrival Time: 3, CPU Burst: 2, Start Time: 3, Termination Time: 5, Turnaround Time: 2, Waiting Time: 0, Response Time: 0
-----
Process ID: P1, Priority: 1, Arrival Time: 0, CPU Burst: 8, Start Time: 0, Termination Time: 10, Turnaround Time: 10, Waiting Time: 2, Response Time: 0
-----
Process ID: P4, Priority: 2, Arrival Time: 8, CPU Burst: 2, Start Time: 10, Termination Time: 12, Turnaround Time: 4, Waiting Time: 2, Response Time: 2
-----
Process ID: P3, Priority: 2, Arrival Time: 0, CPU Burst: 3, Start Time: 12, Termination Time: 15, Turnaround Time: 15, Waiting Time: 12, Response Time: 12
-----
Average Turnaround Time: 7.75
Average Waiting Time: 4.0
Average Response Time: 3.5
```

[Figure7] Report.txt for all cases.

Student Peer evaluation

Criteria	Norah Almubarak	Lujain Albattah	Yara Aljasir	Noura Alshahrani	Refal Abutheeb
Work division: Contributed equally to the work	1	1	1	1	1
Peer evaluation: Level of commitments (Interactivity with otherteam members), and professional behavior towards team & TA	1	1	1	1	1
Project Discussion: Accurate answers, understanding of the presented work,good listeners to questions	1	1	1	1	1
Time management: Attending on time, being ready to start the demo, good time management in discussion and demo.	1	1	1	1	1
Total/4	4	4	4	4	4