Faculty of Engineering & Technology

Department of Electrical & Computer Engineering

ENCS3390: Operating System Concepts

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Programming Task 2

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Section: 2

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Abstract:

Algorithms for scheduling are similar to computer task organizers. This succinct synopsis elucidates their work management methodology, emphasizing categories such as Round Robin, Shortest Job Next, First-Come-First-Served, Priority Scheduling, and Shortest Reminder Time First. We'll also talk about real-time scheduling and how it strikes a compromise between predictability and responsiveness. This is a brief illustration of how scheduling algorithms help computers complete tasks quickly and effectively.

Result:

```
Enter number of Processes: 7
enter time quantum For round robin Algorithm: 5
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Enter arrival time for process[1]: 0
Enter burst time for process [1]: 10
Enter time comes back after for process time[1]: 2
Enter Priority for Process [1]: 3

Enter arrival time for process[2]: 1
Enter burst time for process [2]: 8
Enter time comes back after for process time[2]: 4
Enter Priority for Process [2]: 2

Enter arrival time for process[3]: 3
Enter burst time for process [3]: 14
Enter time comes back after for process time[3]: 6
Enter Priority for Process [3]: 3

Enter arrival time for process[4]: 4
Enter burst time for process [4]: 7
Enter time comes back after for process time[4]: 8
Enter Priority for Process [4]: 1

Enter arrival time for process[5]: 6
Enter burst time for process [5]: 5
Enter time comes back after for process time[5]: 3
Enter Priority for Process [5]: 0

Enter arrival time for process[6]: 7
Enter burst time for process [6]: 4
Enter time comes back after for process time[6]: 6
Enter Priority for Process [6]: 1

Enter arrival time for process[7]: 8
Enter burst time for process [7]: 6
Enter time comes back after for process time[7]: 9
Enter Priority for Process [7]: 2
```

```
****************************************************************************
Process ID      Arrival Time    Burst Time    Comes back after       Priority
1               0               10            2                      3
2               1               8             4                      2
3               3               14            6                      3
4               4               7             8                      1
5               6               5             3                      0
6               7               4             6                      1
7               8               6             9                      2

****************************************************************************
```

```
select a scheduling algorithm:
1. First Come First Serve (FCFS)
2. Round Robin
3. Shortest Remaining Time First (SRTF)
4. Shortest Job First (SJF)
5. Preemptive Priority
6. Non-Preemptive Priority
0. exit
enter your choice:
```

*When entering 1 The output will be First come First serve (FCFS)

```
enter your choice:
1

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FCFS Algorithm
Gantt Chart:
| P1 0-10 | P2 10-18 | P3 18-32 | P4 32-39 | P5 39-44 | P6 44-48 | P7 48-54

Process ID      Arrival Time    Burst Time    Priority        Waiting Time    Turnaround Time
1                   0               10            3               0               10
2                   1               8             2               9               17
3                   3               14            3               15              29
4                   4               7             1               28              35
5                   6               5             0               33              38
6                   7               4             1               37              41
7                   8               6             2               40              46

average turnaround time = 30.86

average waiting time = 23.14

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select a scheduling algorithm:
1. First Come First Serve (FCFS)
2. Round Robin
3. Shortest Remaining Time First (SRTF)
4. Shortest Job First (SJF)
5. Preemptive Priority
6. Non-Preemptive Priority
0. exit
enter your choice:
```

*When entering 2 The output will be Round Robin

```
Round Robin Scheduler

Gantt Chart:
| P1 0-5 | P2 5-10 | P3 10-15 | P4 15-20 | P5 20-25 | P6 25-29 | P7 29-34 | P1 34-39 | P2 39-42 | P3 42-47 | P4 47-49 | P7 49-50 | P3 50-54

Process ID    Arrival Time    Burst Time    Priority      Waiting Time    Turnaround Time
1                 0               10            3             29              39
2                 1               8             2             33              41
3                 3               14            3             37              51
4                 4               7             1             38              45
5                 6               5             0             14              19
6                 7               4             1             18              22
7                 8               6             2             36              42

average turnaround time = 37.00
average waiting time = 29.29

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*When entering 3 The output will SRTF

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SRTF Scheduler

Gantt Chart:
| P1 0-1 | P2 1-2 | P2 2-3 | P2 3-4 | P2 4-5 | P2 5-6 | P2 6-7 | P2 7-8 | P2 8-9 | P6 9-10 | P6 10-11 | P6 11-12 | P6 12-13 | P5 13-14 | P5 14-15 | P5 15-16 | P5 16-17
| P5 17-18 | P7 18-19 | P7 19-20 | P7 20-21 | P7 21-22 | P7 22-23 | P7 23-24 | P4 24-25 | P4 25-26 | P4 26-27 | P4 27-28 | P4 28-29 | P4 29-30 | P4 30-31 | P1 31-32 | P
1 32-33 | P1 33-34 | P1 34-35 | P1 35-36 | P1 36-37 | P1 37-38 | P1 38-39 | P1 39-40 | P3 40-41 | P3 41-42 | P3 42-43 | P3 43-44 | P3 44-45 | P3 45-46 | P3 46-47 | P3 4
7-48 | P3 48-49 | P3 49-50 | P3 50-51 | P3 51-52 | P3 52-53 | P3 53-54 |

Process ID       Arrival Time     Burst Time      Priority       Waiting Time     Turnaround Time
1                0                10              3              30               40
2                1                8               2              0                8
3                3                14              3              37               51
4                4                7               1              20               27
5                6                5               0              7                12
6                7                4               1              2                6
7                8                6               2              10               16

average Turnaround Time = 22.86

average Waiting Time = 15.14
*****************************************
```

*When entering 4 The output will SJF

```
SJF Scheduler
Gantt Chart:
| P1 0-10 | P6 10-14 | P5 14-19 | P7 19-25 | P4 25-32 | P2 32-40 | P3 40-54 |

Process ID         Arrival Time       Burst Time       Priority         Waiting Time     Turnaround Time
1                  0                  10               3                0                10
6                  7                  4                1                3                7
5                  6                  5                0                8                13
7                  8                  6                2                11               17
4                  4                  7                1                21               28
2                  1                  8                2                31               39
3                  3                  14               3                37               51

average Turnaround Time = 23.57

average Waiting Time = 15.86

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*When entering 5 The output will Preemptive Priority

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Preemptive Priority Scheduling with Aging
chart gantt:
| P1 0- 1|| P2 1- 2|| P2 2- 3|| P2 3- 4|| P4 4- 5|| P4 5- 6|| P5 6- 7|| P5 7- 8|| P5 8- 9|| P5 9- 10|| P5 10- 11|| P4 11- 12|| P4 12- 13|| P4 13- 14|| P4 14- 15|| P4 15
- 16|| P6 16- 17|| P6 17- 18|| P6 18- 19|| P6 19- 20|| P2 20- 21|| P2 21- 22|| P2 22- 23|| P2 23- 24|| P2 24- 25|| P7 25- 26|| P7 26- 27|| P7 27- 28|| P7 28- 29|| P7 29
- 30|| P7 30- 31|| P1 31- 32|| P1 32- 33|| P1 33- 34|| P1 34- 35|| P1 35- 36|| P1 36- 37|| P1 37- 38|| P1 38- 39|| P1 39- 40|| P3 40- 41|| P3 41- 42|| P3 42- 43|| P3 43
- 44|| P3 44- 45|| P3 45- 46|| P3 46- 47|| P3 47- 48|| P3 48- 49|| P3 49- 50|| P3 50- 51|| P3 51- 52|| P3 52- 53|| P3 53- 54|
Process ID       Arrival Time     Burst Time      Priority       Waiting Time     Turnaround Time
1                0                10              1              30               40
2                1                8               1              16               24
3                3                14              0              37               51
4                4                7               0              5                12
5                6                5               -1             0                5
6                7                4               0              9                13
7                8                6               1              17               23

average Turnaround Time = 24.00

average Waiting Time = 16.29
```

*When entering 6 The output will Non Preemptive Priority

```
Non-Preemptive Priority Scheduler
| P1 0-10| P5 10-15| P4 15-22| P6 22-26| P2 26-34| P7 34-40| P3 40-54
Process ID       Arrival Time    Burst Time       Priority        Waiting Time    Turnaround Time
1                0               10               3               0               10
2                1               8                2               25              33
3                3               14               3               37              51
4                4               7                1               11              18
5                6               5                0               4               9
6                7               4                1               15    .         19
7                8               6                2               26              32

average Turnaround Time = 24.57

average Waiting Time = 16.86

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```
*When entering 0 will exit form program

Note: for such a big project for simulating the scheduling algorithms the approach was successful but it have some bugs due to the lack of time and the pressure from the other courses the problem is not that big part of a deal since all the code works fine but for simulating for multiple times for the same scheduling algorithm the program may crash due to the memory allocations and for the number of loop the program goes threw