Shayan
DT-22037

OS LAB 02

Question 1: Implement the FCFS code and paste the output below.

Solution:

```
Enter the number of processes -- 3

Enter Burst Time for Process 0 -- 2

Enter Burst Time for Process 1 -- 3

Enter Burst Time for Process 2 -- 4
        PROCESS BURST TIME      WAITING TIME    TURNAROUND TIME

        P0              2               0               2
        P1              3               2               5
        P2              4               5               9
Average Waiting Time -- 2.333333
Average Turnaround Time -- 5.333333
```

Question 2: Implement the SJF code and paste the output below.

Solution:

```
Enter the number of processes -- 3
Enter Burst Time for Process 0 -- 2
Enter Burst Time for Process 1 -- 3
Enter Burst Time for Process 2 -- 4

         PROCESS        BURST TIME      WAITING TIME    TURNAROUND TIME
         P0              2               0               2
         P1              3               2               5
         P2              4               5               9
Average Waiting Time -- 2.333333
Average Turnaround Time -- 5.333333
```

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Question 3: Implement the Round Robin code and paste the output below.

Solution:

```
Enter the number of processes -- 3

Enter Burst Time for process 1 -- 2

Enter Burst Time for process 2 -- 3

Enter Burst Time for process 3 -- 4

Enter time quantum -- 2

The Average Turnaround Time is -- 6.000000
The Average Waiting Time is -- 3.000000
        PROCESS  BURST TIME      WAITING TIME   TURNAROUND TIME
        1        2              0              2
        2        3              4              7
        3        4              5              9
```

Question 4: Implement the Priority Based Scheduling code and paste the output below.

Solution:

```
Enter the number of processes --- 3
Enter the Burst Time & Priority of Process 0 --- 2
5
Enter the Burst Time & Priority of Process 1 --- 3
6
Enter the Burst Time & Priority of Process 2 --- 4
4

PROCESS PRIORITY        BURST TIME      WAITING TIME    TURNAROUND TIME
2               4               4               0               4
0               5               2               4               6
1               6               3               6               9
Average Waiting Time is --- 3.333333
Average Turnaround Time is --- 6.333333
```

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Question 5: Execute all scheduling algorithms on following data and find out the Average Waiting Time and Average Turnaround Time of all scheduling algorithms and discuss your results.

(Quantum Value is 3)

Process Name	Burst Time	Priority
P0	2	3
P1	6	1
P2	4	2

Solution:

- **FCFS:**

```
Enter the number of processes -- 3

Enter Burst Time for Process 0 -- 2

Enter Burst Time for Process 1 -- 6

Enter Burst Time for Process 2 -- 4
        PROCESS BURST TIME      WAITING TIME    TURNAROUND TIME

        P0              2               0               2
        P1              6               2               8
        P2              4               8               12
Average Waiting Time -- 3.333333
Average Turnaround Time -- 7.333333
```

- **SJF:**

```
Enter the number of processes -- 3
Enter Burst Time for Process 0 -- 2
Enter Burst Time for Process 1 -- 6
Enter Burst Time for Process 2 -- 4

        PROCESS         BURST TIME      WAITING TIME    TURNAROUND TIME
        P0               2              0               2
        P2               4              2               6
        P1               6              6               12
Average Waiting Time -- 2.666667
Average Turnaround Time -- 6.666667
```

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- **Round Robin:**

```
Enter the number of processes -- 3

Enter Burst Time for process 1 -- 2

Enter Burst Time for process 2 -- 6

Enter Burst Time for process 3 -- 4

Enter time quantum -- 3

The Average Turnaround Time is -- 8.333333
The Average Waiting Time is -- 4.333333
        PROCESS  BURST TIME      WAITING TIME   TURNAROUND TIME
        1        2              0              2
        2        6              5              11
        3        4              8              12
```

- **Priority Based Scheduling:**

```
Enter the number of processes --- 3
Enter the Burst Time & Priority of Process 0 --- 2
3
Enter the Burst Time & Priority of Process 1 --- 6
1
Enter the Burst Time & Priority of Process 2 --- 4
2

PROCESS PRIORITY        BURST TIME      WAITING TIME    TURNAROUND TIME
1               1               6               0               6
2               2               4               6               10
0               3               2               10              12
Average Waiting Time is --- 5.333333
Average Turnaround Time is --- 9.333333
```

Each scheduling algorithm has its trade-offs. FCFS is simple but inefficient in terms of waiting times. Round Robin provides fair allocation but can increase waiting times for long processes. Priority Scheduling ensures that higher priority processes are executed first, but processes with lower priority may suffer from higher waiting times.

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Conclusion:

FCFS with Sorting appears to be the most efficient scheduling algorithm in this case, offering the lowest average waiting and turnaround times.

Round Robin increases waiting and turnaround times due to preemption overhead, but ensures fairness in execution.

Priority Scheduling works well for high-priority processes but causes delays for low-priority processes, resulting in the highest waiting and turnaround times.