LAB-02

First Come First Serve

```
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02> cd "c:\Us
301\Lab 02\" ; if ($?) { gcc Lab-02-FirstComeFirstServe.c -o Lab-02-FirstComeFirstServe } ; if
Enter the number of processes: 4
Enter Arrival Time and Burst Time for Process P1: 3 3
Enter Arrival Time and Burst Time for Process P2: 0 4
Enter Arrival Time and Burst Time for Process P3: 2 2
Enter Arrival Time and Burst Time for Process P4: 1 4

Process Arrival Time    Burst Time      Completion Time Turnaround Time Waiting Time
P1              3               3               6               3               0
P2              0               4               10              10              6
P3              2               2               12              10              8
P4              1               4               16              15              11

Average Turnaround Time: 9.50
Average Waiting Time: 6.25
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02>
```

Shortest Job First

```
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02> cd "c:\Users\Adminis
301\Lab 02\" ; if ($?) { gcc Lab-02-ShortestJobFirst.c -o Lab-02-ShortestJobFirst } ; if ($?) { .\Lab-02-S
Enter the number of processes: 4
Enter Arrival Time for Process P1: 3
Enter Burst Time for Process P1: 3
Enter Arrival Time for Process P2: 0
Enter Burst Time for Process P2: 4
Enter Arrival Time for Process P3: 2
Enter Burst Time for Process P3: 2
Enter Arrival Time for Process P4: 1
Enter Burst Time for Process P4: 4

Process Arrival Time    Burst Time      Completion Time Turnaround Time Waiting Time
P2              0               4               4               4               0
P4              1               4               8               7               3
P3              2               2               10              8               6
P1              3               3               13              10              7

Average Turnaround Time: 7.25
Average Waiting Time: 4.00
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02>
```

Round Robin

```
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02> cd
301\Lab 02\" ; if ($?) { gcc Lab-02-RoundRobin.c -o Lab-02-RoundRobin } ; if ($?) { .\Lab
Enter the number of processes: 3

Enter Burst Time for process 1: 10

Enter Burst Time for process 2: 5

Enter Burst Time for process 3: 8

Enter time quantum: 2

The Average Turnaround Time is: 19.67
The Average Waiting Time is: 12.00

PROCESS  BURST TIME      WAITING TIME    TURNAROUND TIME
        1        10              13              23
        2        5               10              15
        3        8               13              21
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02>
```

Priority Based Scheduling

```
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02> cd "
301\Lab 02\" ; if ($?) { gcc Lab-02-Priority-Based-Scheduling.c -o Lab-02-Priority-Based-S
Enter the number of processes: 4
Enter the burst time and Priority of Process 1: 6 3
Enter the burst time and Priority of Process 2: 8 1
Enter the burst time and Priority of Process 3: 7 2
Enter the burst time and Priority of Process 4: 3 4


PROCESS PRIORITY        BURST TIME      WAITING TIME    TURNAROUND TIME
2       1               8               0               8
3       2               7               8               15
1       3               6               15              21
4       4               3               21              24

Average waiting time: 11.00
Average turnaround time: 17.00
PS C:\Users\Administrator\Desktop\6th Semester\OS Lab\OS-Labs-CT-353-DT-22301\Lab 02>
```

Q5

Discussion:

FCFS: It is simple and easy to implement but can suffer from convoy effect where longer processes delay shorter ones.

Average waiting time in FCFS is higher compared to SJF because it does not prioritize the shortest burst time.

SJF: SJF minimizes waiting time by prioritizing processes with the shortest burst time first.

It generally results in the lowest average waiting time and turnaround time. However, it's not always practical because we need to know the burst time in advance, which isn't always possible.

Round Robin (RR): RR is fair because each process gets a fair share of CPU time, but it can lead to higher average waiting time and turnaround time compared to SJF.

The time quantum plays a crucial role in determining efficiency. A very small quantum increases context-switching overhead, while a very large quantum resembles FCFS.

Priority Scheduling: Priority Scheduling may lead to starvation for processes with lower priority if higher priority processes keep coming.

It works well when priorities are accurately assigned, but as seen here, it can lead to higher average turnaround time compared to SJF.

Conclusion: SJF is the most efficient in terms of waiting time and turnaround time, but it's not always feasible in real-world applications due to the requirement of knowing burst times in advance.

FCFS and Round Robin are easier to implement but result in higher waiting times.

Priority Scheduling can lead to starvation, and its performance depends on how priorities are assigned.