

LAB: 02

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COURSE: Operating Systems

COURSE CODE: CT-353

Assumptions:

To solve the first four question I have used the data provided in fifth question and have discussed those results in the fifth question.

Q1

```
D:\os\FCFS.exe
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
-----
Process exited after 12.87 seconds with return value 0
Press any key to continue . . .
```

Q2

```
Enter the number of processes: 3
Enter burst time for process P1: 2
Enter burst time for process P2: 6
Enter burst time for process P3: 4
```

Process	Burst Time	Waiting Time	Turnaround Time
P1	2	0	2
P3	4	2	6
P2	6	6	12

```
Average Waiting Time: 2.67
Average Turnaround Time: 6.67
```

```
-----
Process exited after 5.75 seconds with return value 0
Press any key to continue . . .
```

Enter the number of processes: 3

Enter Burst Time for process 1: 2

Enter Burst Time for process 2: 4

Enter Burst Time for process 3: 6

Enter time quantum: 3

The Average Turnaround Time is: 7.666667

The Average Waiting Time is: 3.666667

PROCESS	BURST TIME	WAITING TIME	TURNAROUND TIME
1	2	0	2
2	4	5	9
3	6	6	12

Process exited after 13.86 seconds with return value 0

Press any key to continue . . .

```
Enter the number of processes: 3
Enter burst time for process P1: 2
Enter priority for process P1 (lower value = higher priority): 3
Enter burst time for process P2: 6
Enter priority for process P2 (lower value = higher priority): 1
Enter burst time for process P3: 4
Enter priority for process P3 (lower value = higher priority): 2

Process Priority      Burst Time      Waiting Time      Turnaround Time
P2           1           6              0                6
P3           2           4              6               10
P1           3           2             10               12

Average Waiting Time: 5.33
Average Turnaround Time: 9.33

-----
Process exited after 8.662 seconds with return value 0
Press any key to continue . . .
```

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.