Lab 2

Objective: Write a C program to simulate the following CPU scheduling algorithms to find turnaround time and waiting time for the above problem.

a) FCFS b) SJF c) Round Robin d) Priority

EXERCISE:

QUESTION 1 OUTPUT:

```
FCFS Scheduling:
Process Burst Time  Waiting Time    Turnaround Time
P0  24      0       24
P1  3       24      27
P2  3       27      30

Average Waiting Time: 17.00
Average Turnaround Time: 19.00


=== Code Execution Successful ===
```

QUESTION 2 OUTPUT:

```
SJF Scheduling:
Process Burst Time  Waiting Time    Turnaround Time
P4  3       0       3
P1  6       3       9
P3  7       9       16
P2  8       16      24

Average Waiting Time: 7.00
Average Turnaround Time: 13.00


=== Code Execution Successful ===
```

QUESTION 3 OUTPUT:

```
Round Robin Scheduling:
Process Burst Time  Waiting Time    Turnaround Time
P1  10      13      23
P2  5       10      15
P3  8       13      21

Average Waiting Time: 12.00
Average Turnaround Time: 19.67


=== Code Execution Successful ===
```

QUESTION 4 OUTPUT:

```
Priority Scheduling:
Process Burst Time  Priority    Waiting Time    Turnaround Time
P2  1       1       0       1
P5  5       2       1       6
P1  10      3       6       16
P3  2       4       16      18
P4  1       5       18      19

Average Waiting Time: 8.20
Average Turnaround Time: 12.00


=== Code Execution Successful ===
```

QUESTION 5:

```
Given Data:
    PROCESS BURST TIME  PRIORITY
    P0      2       3
    P1      6       1
    P2      4       2

FCFS Scheduling:
    PROCESS BURST TIME  WAITING TIME    TURNAROUND TIME
    P0      2       0       2
    P1      6       2       8
    P2      4       8       12

Average Waiting Time: 3.33
Average Turnaround Time: 7.33

SJF Scheduling:
    PROCESS BURST TIME  WAITING TIME    TURNAROUND TIME
    P0      2       0       2
    P2      4       2       6
    P1      6       6       12

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

```
Round Robin Scheduling:
    PROCESS BURST TIME  WAITING TIME    TURNAROUND TIME
    P0      2       0       2
    P1      4       5       9
    P2      6       6       12

Average Waiting Time: 3.67
Average Turnaround Time: 7.67

Priority Scheduling:
    PROCESS PRIORITY    BURST TIME  WAITING TIME    TURNAROUND TIME
    P1      1       4       0       4
    P2      2       6       4       10
    P0      3       2       10      12

Average Waiting Time: 4.67
Average Turnaround Time: 8.67


=== Code Execution Successful ===
```

OBSERVATION:

First-Come, First-Served (FCFS):

- Processes are executed in the order of arrival, irrespective of burst time or priority.
- Result:
  - High waiting time and turnaround time for longer processes (e.g., P1).
  - Simple but inefficient when processes vary in burst times.

Shortest Job First (SJF):

- Executes shortest burst times first, minimizing waiting and turnaround times.
- Result:
  - Achieved the lowest average waiting time and turnaround time.
  - P1 suffered delays but benefited from prioritizing shorter jobs like P0 and P2.

Round Robin (RR) (Quantum = 3):

- Processes are executed cyclically with equal CPU time slices.
- Result:
  - Balanced waiting times for all processes, ensuring fairness.
  - Higher average turnaround time compared to SJF due to context switching.

Priority Scheduling:

- Executes based on priority, with lower numerical values indicating higher priority.
- Result:
  - P1 (highest priority) completed first, minimizing its waiting time.
  - Starvation risk for lower-priority processes if longer.

ROUND ROBIN AND PRIORITY BASED

Objective: Write a C program to simulate the following CPU scheduling algorithms to find turnaround time and waiting time for the above problem.

a) Round Robin

b) Priority

EXERCISE:

a) OUTPUT:

```
Round Robin Scheduling:
Process Burst Time  Waiting Time    Turnaround Time
P1  10      13      23
P2  5       10      15
P3  8       13      21

Average Waiting Time: 12.00
Average Turnaround Time: 19.67


=== Code Execution Successful ===
```

b) OUTPUT:

```
Priority Scheduling:
Process Burst Time  Priority    Waiting Time    Turnaround Time
P2  1       1       0       1
P5  5       2       1       6
P1  10      3       6       16
P3  2       4       16      18
P4  1       5       18      19

Average Waiting Time: 8.20
Average Turnaround Time: 12.00


=== Code Execution Successful ===
```

QUESTION 5:

```
Round Robin Scheduling:
    PROCESS BURST TIME  WAITING TIME    TURNAROUND TIME
    P0      2       0       2
    P1      4       5       9
    P2      6       6       12

Average Waiting Time: 3.67
Average Turnaround Time: 7.67

Priority Scheduling:
    PROCESS PRIORITY    BURST TIME  WAITING TIME    TURNAROUND TIME
    P1      1       4       0       4
    P2      2       6       4       10
    P0      3       2       10      12

Average Waiting Time: 4.67
Average Turnaround Time: 8.67


=== Code Execution Successful ===
```

OBSERVATION:

Round Robin (RR) (Quantum = 3):

- Processes are executed cyclically with equal CPU time slices.
- Result:
  - Balanced waiting times for all processes, ensuring fairness.
  - Higher average turnaround time compared to SJF due to context switching.

Priority Scheduling:

- Executes based on priority, with lower numerical values indicating higher priority.
- Result:
  - P1 (highest priority) completed first, minimizing its waiting time.
  - Starvation risk for lower-priority processes if longer.