# CSE 321 Operating Systems

# Lab Assignment 3

# **Total Marks: 30**

Given the list of processes, their CPU burst times, arrival times and priorities implement SJF, Priority and Round Robin scheduling algorithms on the processes with preemption. For each of the scheduling policies, compute and print the completion Time(CT), Turnaround Time(TAT), and Waiting Time(WT) for each process using **C Programming.**

**Waiting time:** Processes need to wait in the process queue before execution starts and in execution while they get preempted.

**Turnaround time:** Time elapsed by each process to get completely served. (Difference between submission time and completion time).

**Instructions:**

1. **You must use Struct to implement each of the algorithms**
2. **You must take user input for no. of processes, AT and BT.**
3. **Need to show individual CT, TAT and WT for each of the processes not the average.**
4. **For Priority Scheduling, lower number will get the highest priority.**

**Task 1:** **SJF Scheduling with preemption**

**You can use the following input as sample:**

|  |  |  |
| --- | --- | --- |
| **Process** | **Arrival Time** | **Burst Time** |
| P1 | 0 | 5 |
| P2 | 2 | 2 |
| P3 | 3 | 7 |
| P4 | 4 | 4 |
| P5 | 5 | 5 |

**Solution in a Gantt chart:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **P1** | **P2** | **P2** | **P1** | **P4** | **P5** | **P3** |

**0 2 3 4 7 11 16 23**

**Task 2:** **Round Robin**

**You can use the following input as sample:**

Time Quantum = 20 ms

|  |  |
| --- | --- |
| **Process** | **Burst Time** |
| P1 | 53 |
| P2 | 17 |
| P3 | 68 |
| P4 | 24 |

**Solution in a Gantt chart:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **P1** | **P2** | **P3** | **P4** | **P1** | **P3** | **P4** | **P1** | **P3** | **P3** |

1. **20 37 57 77 97 117 121 134 154 162**

**Task 3: Priority Scheduling**

**Note: Lower number will get the highest priority.**

**You can use the following input as sample:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Process** | **Arrival Time** | **Burst Time** | **Priority** |
| P1 | 0 | 15 | 2 |
| P2 | 14 | 5 | 4 |
| P3 | 3 | 10 | 0 |
| P4 | 9 | 22 | 3 |
| P5 | 7 | 16 | 1 |

**Solution in a Gantt chart:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **P1** | **P3** | **P5** | **P1** | **P4** | **P2** |

**0 3 13 29 41 63 68**