



Lab 4: CPU Scheduling

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1 Exercises

1.1 First-Come, First-Served Scheduling

Consider the following set of 5 processes that all arrive at time 0, with the length of the CPU burst given in milliseconds:

Process	Burst Time
P1	10
P2	5
P3	8
P4	15
P5	7

Suppose the processes arrive in the order: **P1, P2, P3, P4, P5**. Draw the **Gantt Chart** for the schedule and calculate the **average waiting time** of the processes.

1.2 Shortest-Job-First Scheduling

Consider the following set of 5 processes, all arriving at time 0, with the length of the CPU burst given in milliseconds:

Process	Burst Time
P1	12
P2	4
P3	9
P4	6
P5	3

Using **SJF scheduling** (non-preemptive), draw the **Gantt Chart** for the schedule and calculate the **average waiting time** of the processes.

1.3 Shortest-Remaining-Time-First Scheduling

Consider the following set of 5 processes, with their arrival times and the length of the CPU burst given in milliseconds:

Process	Arrival Time	Burst Time
P1	0	9
P2	1	5
P3	2	7
P4	3	3
P5	4	6

Using **SRTF scheduling** (preemptive SJF), draw the **Gantt Chart** for the schedule and calculate the **average waiting time** and **average turnaround time** for the processes.

1.4 Round Robin Scheduling

Consider the following set of 5 processes that arrive at time 0, with the length of the CPU burst given in milliseconds. We use a time quantum of 4 milliseconds:

Process	Burst Time
P1	10
P2	5
P3	8
P4	15
P5	7

Using **Round Robin (RR)** scheduling with a **time quantum of 4 milliseconds**, draw the **Gantt Chart** for the schedule and calculate the **average waiting time** of the processes.

1.5 Priority Scheduling

Consider the following set of 5 processes, assumed to have arrived at time 0 in the order P1, P2, P3, P4, P5 with the length of the CPU burst and priority given in milliseconds:

Process	Burst Time	Priority
P1	10	3
P2	5	1
P3	8	2
P4	15	4
P5	7	2

Using **preemptive Priority Scheduling** with a **time quantum of 2 milliseconds**, draw the **Gantt Chart** for the schedule and calculate the **average waiting time** of the processes.