

Lab Five

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1 PROBLEM ONE

Q: Consider the following set of processes, with the length of the CPU burst in milliseconds. All processes are assumed to arrive in the order P1, P2, P3, P4, P5 at time = 0.

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

- Draw 4 Gantt charts that illustrate these processes using FCFS, SJF, NP-Pri, and RR (quantum = 1).
- What is the turnaround time of each scheduling algorithm?
- What is the waiting time of each scheduling algorithm?
- Which algorithm results in the minimum average waiting time?

FCFS	NP-SJF	NP-Pri	RR
P1	P2	P2	P1
P1	P4	P5	P2
P1	P3	P5	P3
P1	P3	P5	P4
P1	P5	P5	P5
P1	P5	P5	P1
P1	P5	P1	P3
P1	P5	P1	P5
P1	P5	P1	P1
P1	P1	P1	P5
P2	P1	P1	P1
P3	P1	P1	P5
P3	P1	P1	P1
P4	P1	P1	P5
P5	P1	P1	P1
P5	P1	P3	P1
P5	P1	P3	P1
P5	P1	P4	P1

1.1 TURNAROUND TIMES

FCFS $\Rightarrow (10 + 11 + 14 + 15 + 20)/5 = 70/5$

NP-SJF $\Rightarrow (1 + 2 + 4 + 9 + 20)/5 = 36/5$

NP-Pri $\Rightarrow (1 + 6 + 17 + 20 + 21)/5 = 65/5$

RR $\Rightarrow (19 + 2 + 7 + 4 + 16)/5 = 38/5$

1.2 WAITING TIMES

FCFS $\Rightarrow (0 + 10 + 11 + 12 + 15)/5 = 48/5$

NP-SJF $\Rightarrow (0 + 1 + 2 + 4 + 9)/5 = 16/5$

NP-Pri $\Rightarrow (0 + 1 + 7 + 17 + 19)/5 = 43/5$

RR $\Rightarrow (0 + 1 + 2 + 3 + 4)/5 = 10/5$

1.3 MINIMUM AVERAGE WAITING TIME

Round Robin has the minimum average wait time.