

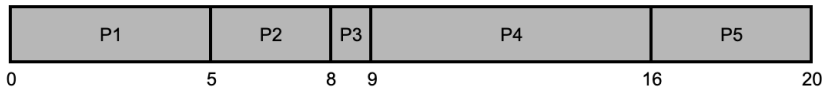
Assignment 4

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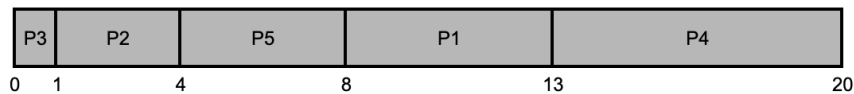
Question 1:

a)

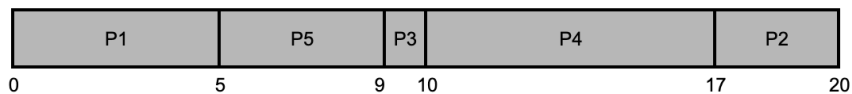
FCFS



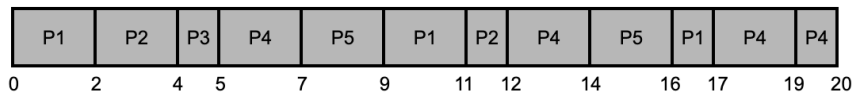
SJF



Non-Preemptive Priority



RR (quantum = 2, no priority)



b)

$$\text{turnaround} = \text{completion time} - \text{arrival time}$$

FCFS turnaround:

$$P1 = 5 - 0 = 5$$

SJF turnaround:

$$P1 = 13 - 0 = 13$$

$$P2 = 8-0 = 8$$

$$P3 = 9-0 = 9$$

$$P4 = 16-0 = 16$$

$$P5 = 20-0 = 20$$

Non-Preemptive Priority turnaround:

$$P1 = 5-0 = 5$$

$$P2 = 20-0 = 20$$

$$P3 = 10-0 = 10$$

$$P4 = 17-0 = 17$$

$$P5 = 9-0 = 9$$

$$P2 = 4-0 = 4$$

$$P3 = 1-0 = 1$$

$$P4 = 20-0 = 20$$

$$P5 = 8-0 = 8$$

RR (quantum = 2, no priority) turnaround:

$$P1 = 17-0 = 17$$

$$P2 = 12-0 = 12$$

$$P3 = 5-0 = 5$$

$$P4 = 20-0 = 20$$

$$P5 = 16-0 = 16$$

c)

$$waiting = turnaround\ time - burst\ time$$

FCFS waiting:

$$P1 = 5-5 = 0$$

$$P2 = 8-3 = 5$$

$$P3 = 9-1 = 8$$

$$P4 = 16-7 = 9$$

$$P5 = 20-4 = 16$$

$$\underline{average\ waiting\ time} = (0 + 5 + 8 + 9 + 16) / 5 = 7.60\ ms$$

SJF waiting:

$$P1 = 13-5 = 8$$

$$P2 = 4-3 = 1$$

$$P3 = 1-1 = 0$$

$$P4 = 20-7 = 13$$

$$P5 = 8-4 = 4$$

$$\underline{average\ waiting\ time} = (8 + 1 + 0 + 13 + 4) / 5 = 5.20\ ms$$

Non-Preemptive Priority waiting:

$$P1 = 5-5 = 0$$

$$P2 = 20-3 = 17$$

$$P3 = 10-1 = 9$$

RR (quantum = 2, no priority) waiting:

$$P1 = 17-5 = 12$$

$$P2 = 12-3 = 9$$

$$P3 = 5-1 = 4$$

$$P4 = 17 - 7 = 10$$

$$P4 = 20 - 7 = 13$$

$$P5 = 9 - 4 = 5$$

$$P5 = 16 - 4 = 12$$

$$\text{average waiting time} = (0 + 17 + 9 + 10 + 5) / 5 = 8.20 \text{ ms}$$

$$\text{average waiting time} = (12 + 9 + 4 + 13 + 12) / 5 = 10.00 \text{ ms}$$

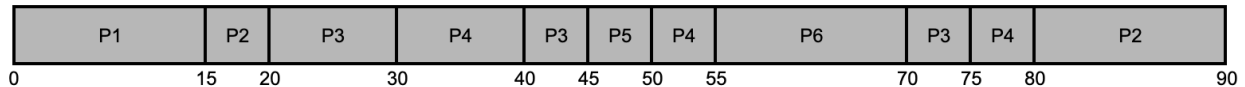
d)

The SJF algorithm results in the minimum average wait time of 5.20 ms

Question 2:

a)

Preemptive Priority Based RR (quantum = 10)



b)

$$\text{turnaround} = \text{completion time} - \text{arrival time}$$

Turnaround:

$$P1 = 15 - 0 = 15$$

$$P2 = 90 - 0 = 90$$

$$P3 = 75 - 20 = 55$$

$$P4 = 80 - 20 = 60$$

$$P5 = 50 - 45 = 5$$

$$P6 = 70 - 55 = 15$$

c)

$$\text{waiting} = \text{turnaround time} - \text{burst time}$$

Waiting:

$$P1 = 15 - 15 = 0$$

$$P2 = 90 - 20 = 70$$

$$P3 = 55 - 20 = 35$$

$$P4 = 60 - 20 = 40$$

$$P5 = 5 - 5 = 0$$

$$P6 = 15 - 15 = 0$$

$$\text{average waiting time} = (0 + 70 + 35 + 40 + 0 + 0) / 6 = 24.17 \text{ ms}$$