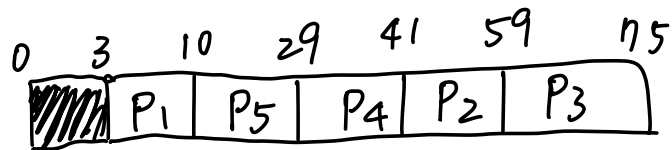


1. First Come First Serve



Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time	Response Time
P1	3	7	10	$10 - 3 = 7$	$7 - 7 = 0$	0
P2	23	18	59	$59 - 23 = 36$	$36 - 18 = 18$	18
P3	34	16	75	$75 - 34 = 41$	$41 - 16 = 25$	25
P4	16	12	41	$41 - 16 = 25$	$25 - 12 = 13$	13
P5	7	19	29	$29 - 7 = 22$	$22 - 19 = 3$	3

Turnaround time = completion time - arrival time

Waiting time = Turnaround time - burst time

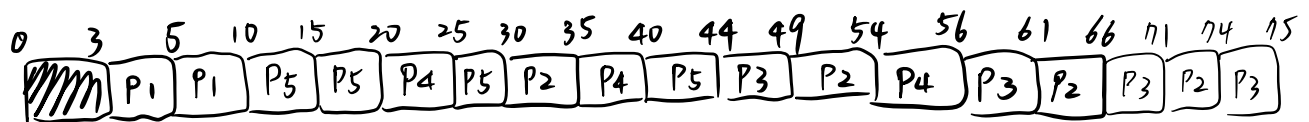
$$\text{Avg. Turnaround Time} = \frac{7 + 36 + 41 + 25 + 22}{5} = 26.2$$

$$\text{Avg. Waiting Time} = \frac{0 + 18 + 25 + 13 + 3}{5} = 11.8$$

$$\text{Avg. Response Time} = \frac{0 + 18 + 25 + 13 + 3}{5} = 11.8$$

2. Round Robin

	Arrival	Burst
P ₁	3	7-2-5 ✓
P ₅	7	19-5=14-5=9-5=4-4 ✓
P ₄	16	12-5=7-5=2 ✓
P ₂	23	18-5=13-5=8-5=3
P ₃	34	16-5=11-5=6-5=1



Ready Queue: ~~P₄~~ ~~P₅~~ ~~P₂~~ ~~P₄~~ ~~P₅~~ ~~P₃~~ ~~P₂~~ ~~P₄~~ ~~P₃~~ P₂ P₃

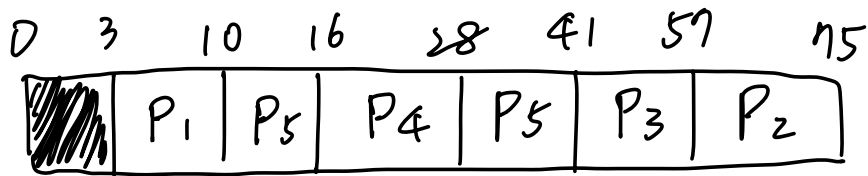
	Completion	Turnaround	Waiting	Response
P ₁	10	10-3=7	7-7=0	3-3=0
P ₂	74	74-23=51	51-18=33	30-23=7
P ₃	75	75-34=41	41-16=25	44-34=10
P ₄	56	56-16=40	40-12=28	20-16=4
P ₅	44	44-7=37	37-19=18	10-7=3

$$\text{Avg. Turnaround Time} = \frac{7+51+41+40+37}{5} = 35.2$$

$$\text{Avg. Waiting Time} = \frac{0+33+25+28+18}{5} = 20.8$$

$$\text{Avg. Response Time} = \frac{0+7+10+4+3}{5} = 4.8$$

3. Shortest Job First




Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time	Response Time
P ₁	3	7	10	$10 - 3 = 7$	$7 - 7 = 0$	$7 - 7 = 0$
P ₂	23	18	75	$75 - 23 = 52$	$52 - 18 = 34$	$57 - 23 = 34$
P ₃	34	16	57	$57 - 34 = 23$	$23 - 16 = 7$	$41 - 34 = 7$
P ₄	16	12	28	$28 - 16 = 12$	$12 - 12 = 0$	$16 - 16 = 0$
P ₅	7	19	41	$41 - 7 = 34$	$34 - 19 = 15$	$10 - 7 = 3$

$$\text{Avg. Turnaround Time} = \frac{7 + 52 + 23 + 12 + 34}{5} = 25.6$$

$$\text{Avg. Waiting Time} = \frac{0 + 34 + 7 + 0 + 15}{5} = 11.2$$

$$\text{Avg. Response Time} = \frac{0 + 34 + 7 + 0 + 3}{5} = 8.8$$

4. Longest Job First

0	3	7	16	23	34	50	60	67	72	75
	P ₁	P ₅	P ₄	P ₂	P ₃	P ₅	P ₂	P ₄	P ₁	

Process	Arrival Time	Burst Time	Completion Time	Turnaround Time	Waiting Time	Response Time
P1	3	7	75	$75 - 3 = 72$	$72 - 4 - 3 = 65$	$3 - 3 = 0$
P2	23	18	67	$67 - 23 = 44$	$23 - 0 - 23 = 0$	$23 - 23 = 0$
P3	34	16	50	$50 - 34 = 16$	$34 - 0 - 34 = 0$	$34 - 34 = 0$
P4	16	12	72	$72 - 16 = 56$	$67 - 7 - 16 = 43$	$16 - 16 = 0$
P5	7	19	60	$60 - 7 = 53$	$50 - 9 - 7 = 34$	$7 - 7 = 0$

$$\text{Avg. Turnaround Time} = \frac{72 + 44 + 16 + 56 + 53}{5} = 48.2$$

$$\text{Avg. Waiting Time} = \frac{65 + 0 + 0 + 43 + 34}{5} = 28.4$$

$$\text{Avg. Response Time} = 0$$