

Process Name	Time to Process	Job Submission Time
P1	7	3
P2	18	23
P3	16	34
P4	12	16
P5	19	7

Calculate Turn Around Time, Wait Time and Response Time for following algorithms:

- **Burst time** is the total time taken by the process for its execution on the CPU.
- **Arrival time** is the time when a process enters into the ready state and is ready for its execution.
- **Exit time** is the time when a process completes its execution and exit from the system.
- **Response time** = Time at which the process gets the CPU for the first time - Arrival time
- **Turnaround time** = Burst time + Waiting time / Turnaround time = Exit time - Arrival time
- **Waiting time** = Turnaround time - Burst time

1. First Come First Serve

Order:

P1 (7)	P5 (19)	P4 (12)	P2 (18)	P3 (16)
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Process Name	Arrival Time	Burst Time	Exit Time	Turnaround Time	Response Time	Wait Time
P1	3	7	10	7	0	0
P5	7	19	29	22	3	3
P4	16	12	41	25	13	13
P2	23	18	59	36	18	18
P3	34	16	75	41	25	25
Avg.				26.2	11.8	11.8

2. Round Robin

Assume the CPU scheduling policy is Round Robin with time quantum = 5

Order:

P1 (5)	P5 (5)	P1 (2)	P5 (5)	P4 (5)	P5 (5)	P2 (5)	P4 (5)	P5 (4)	P3 (5)
P2 (5)	P4 (5)	P3 (5)	P2 (5)	P3 (5)	P2 (3)	P3 (1)			

Process Name	Arrival Time	Burst Time	Exit Time	Turnaround Time	Response Time	Wait Time
P1	3	7	15	12	0	5
P5	7	19	44	37	1	18
P4	16	12	56	40	4	28
P2	23	18	74	51	7	33
P3	34	16	75	41	10	25

Avg.				36.2	4.4	21.8
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3. Shortest job first

Order:

P1 (7)	P5 (6)	P4 (12)	P5 (13)	P3 (16)	P2 (18)
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Process Name	Arrival Time	Burst Time	Exit Time	Turnaround Time	Response Time	Wait Time
P1	3	7	10	7	0	0
P5	7	19	41	34	3	15
P4	16	12	28	12	0	0
P2	23	18	75	52	34	34
P3	34	16	57	23	7	7
Avg.				25.6	8.8	11.2

4. Longest job first

Order:

P1 (4)	P5 (9)	P4 (7)	P2 (11)	P3 (16)	P5 (10)	P2 (7)	P4 (5)	P1 (3)
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Process Name	Arrival Time	Burst Time	Exit Time	Turnaround Time	Response Time	Wait Time
P1	3	7	75	72	0	65
P5	7	19	60	53	0	34
P4	16	12	72	56	0	44
P2	23	18	67	44	0	26
P3	34	16	50	16	0	0
Avg.				48.2	0	33.8