

Process	Burst Time	Priority	Arrival time
P0	8	5	0
P1	2	4	2
P2	1	6	4
P3	3	3	6
P4	5	2	5
P5	4	7	3

**Note:** I have assumed that the highest number is the highest priority in priority scheduling.

## 1. FCFS

<b>P<sub>0</sub></b>	<b>P<sub>1</sub></b>	<b>P<sub>5</sub></b>	<b>P<sub>2</sub></b>	<b>P<sub>4</sub></b>	<b>P<sub>3</sub></b>	
0	8	10	14	15	20	23

**Average waiting time** =  $0 + (8-2) + (14-4) + (20-6) + (15-5) + (10-3) / 6$

$$= 0+6+10+14+10+7/6$$

$$= 48/6 = 7.8$$

**Average turn-around time** =  $(8-0) + (10-2) + (15-4) + (23-6) + (20-5) + (14-3) / 6$

$$= 8+8+11+17+15+11 / 6$$

$$= 70/6 = 11.6$$

## 2. SJF:

**#non-preemptive**

<b>P<sub>0</sub></b>	<b>P<sub>2</sub></b>	<b>P<sub>1</sub></b>	<b>P<sub>3</sub></b>	<b>P<sub>5</sub></b>	<b>P<sub>4</sub></b>	
0	8	9	11	14	18	23

**Average waiting time** =  $0 + (9-2) + (8-4) + (11-6) + (18-5) + (14-3) / 6$

$$= 0+7+4+5+13+11/6$$

$$= 40/6 = 6.6$$

$$\begin{aligned}
 \text{Average turn-around time} &= (8-0) + (11-2) + (9-4) + (14-6) + (23-5) + (18-3) / 6 \\
 &= 8+9+5+8+18+15 / 6 \\
 &= 63/6 = 10.5
 \end{aligned}$$

**#preemptive**

<b>P<sub>0</sub></b>	<b>P<sub>1</sub></b>	<b>P<sub>2</sub></b>	<b>P<sub>5</sub></b>	<b>P<sub>3</sub></b>	<b>P<sub>4</sub></b>	<b>P<sub>0</sub></b>	
0	2	4	5	9	12	17	23

$$\begin{aligned}
 \text{Average waiting time} &= (17-2) + (2-2) + (4-4) + (9-6) + (12-5) + (5-3) / 6 \\
 &= 15+0+0+3+7+2/6 \\
 &= 27/6 = 4.5
 \end{aligned}$$

$$\begin{aligned}
 \text{Average turn-around time} &= (23-0) + (4-2) + (5-4) + (12-6) + (17-5) + (9-3) / 6 \\
 &= 23+2+1+6+12+6 / 6 \\
 &= 50/6 = 8.3
 \end{aligned}$$

### 3. PS:

**#non-preemptive**

<b>P<sub>0</sub></b>	<b>P<sub>5</sub></b>	<b>P<sub>2</sub></b>	<b>P<sub>1</sub></b>	<b>P<sub>3</sub></b>	<b>P<sub>4</sub></b>	
0	8	12	13	15	18	23

$$\begin{aligned}
 \text{Average waiting time} &= 0 + (13-2) + (12-4) + (15-6) + (18-5) + (8-3) / 6 \\
 &= 0+11+8+9+13+5/6 \\
 &= 46/6 = 7.6
 \end{aligned}$$

$$\begin{aligned}
 \text{Average turn-around time} &= (8-0) + (15-2) + (13-4) + (18-6) + (23-5) + (12-3) / 6 \\
 &= 8+13+9+12+18+9 / 6 \\
 &= 69/6 = 11.5
 \end{aligned}$$

**#preemptive**

<b>P<sub>0</sub></b>	<b>P<sub>5</sub></b>	<b>P<sub>2</sub></b>	<b>P<sub>0</sub></b>	<b>P<sub>1</sub></b>	<b>P<sub>3</sub></b>	<b>P<sub>4</sub></b>	
0	3	7	8	13	15	18	23

$$\begin{aligned}
 \text{Average waiting time} &= (8-3) + (13-2) + (7-4) + (15-6) + (18-5) + (3-3) / 6 \\
 &= 5+11+3+9+13+0/6 \\
 &= 41/6 = 6.8
 \end{aligned}$$

$$\begin{aligned}
 \text{Average turn-around time} &= (13-0) + (15-2) + (8-4) + (18-6) + (23-5) + (7-3) / 6 \\
 &= 13+13+4+12+18+4 / 6 \\
 &= 64/6 = 10.6
 \end{aligned}$$

## 4. RR:

#non-preemptive

P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>	P <sub>5</sub>
0	8	10	11	14	19
					23

$$\begin{aligned}
 \text{Average waiting time} &= 0 + (8-2) + (10-4) + (11-6) + (14-5) + (19-3) / 6 \\
 &= 0+6+6+5+9+16/6 \\
 &= 42/6 = 7
 \end{aligned}$$

$$\begin{aligned}
 \text{Average turn-around time} &= 8 + (10-2) + (11-4) + (14-6) + (19-5) + (23-3) / 6 \\
 &= 8+8+7+8+14+20 / 6 \\
 &= 65/6 = 10.8
 \end{aligned}$$

## Part-3

$$\begin{aligned}
 \text{Throughput} &= \# \text{ of processes} / \text{Total time unit} \\
 &= 6 / 23 = 0.26
 \end{aligned}$$