

Operating System

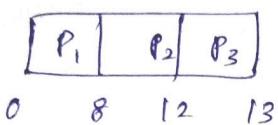
Assignment - 1

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19 CSE030

1. what is the average turn around time for the following process (i) using FCFS (ii) Non-preemptive SJF (iii) preemptive SJF.

(i)



Process	AT	BT	WT	TAT
P_1	0.0	8	$0 - 0 = 0$	8
P_2	0.4	4	$8 - 0.4 = 7.6$	11.6
P_3	1	1	$12 - 1 = 11$	12

$$\frac{31.6}{2}$$

$$ATAT = 10.5 \text{ ms}$$

(ii)

P_1	P_3	P_2
0	8	9

0 8 9 13

Process	AT	ET	WT	TAT
P_1	0.0	8	$0 - 0 = 0$	8
P_2	0.4	4	$9 - 0.4 = 8.6$	12.6
P_3	1	1	$8 - 1 = 7$	8

$$\frac{28.6}{3}$$

$$ATAT = 9.53 \text{ ms.}$$

(iii)

P_1	P_2	P_3	P_2	P_1
0	0.4	1	2	5.4

0 0.4 1 2 5.4 13

Process	AT	ET	WT	TAT
P_1	0.0	8	$0 + (5.4 - 0.4)$ $= 5 - 0 = 5$	13
P_2	0.4	4	$0.4 + (2 - 1)$ $= 1.4 - 0.4 = 1$	5
P_3	1	1	$1 - 1 = 0$	1

$$\frac{19}{3}$$

$$ATAT = 6.33 \text{ ms}$$

2. Consider the following process with CPU Burst time given in milliseconds.

	BT	Priority
P ₁	10	3
P ₂	1	1
P ₃	2	3
P ₄	1	4
P ₅	5	2

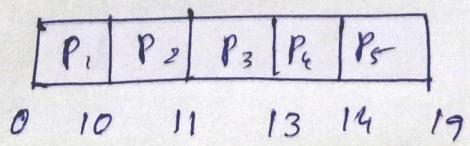
Process X arrived at P₁, P₂, P₃, P₄, P₅

Order of arrived at time 0.

Draw Gantt chart to show the execution using

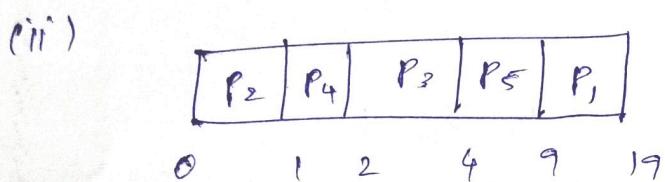
- (i) FCFS (ii) SJF (iii) Non-preemptive priority
- (iv) Round Robin ($T_q = 1\text{ ms}$).

Calculate waiting time, Turn around time for each scheduling time.



Process	ET	WT	TAT
P ₁	10	0	10
P ₂	1	10	11
P ₃	2	11	13
P ₄	1	13	14
P ₅	5	14	19
		<u>48</u>	<u>67</u>

TWT = 48 ms
Total turn around time = 67 ms.



Process	ET	WT	TAT
P ₂	1	0	1
P ₄	1	1	2
P ₃	2	2	4
P ₅	5	4	9
P ₁	10	9	19

TWT = 16 ms
Total turn around time = 35 ms.

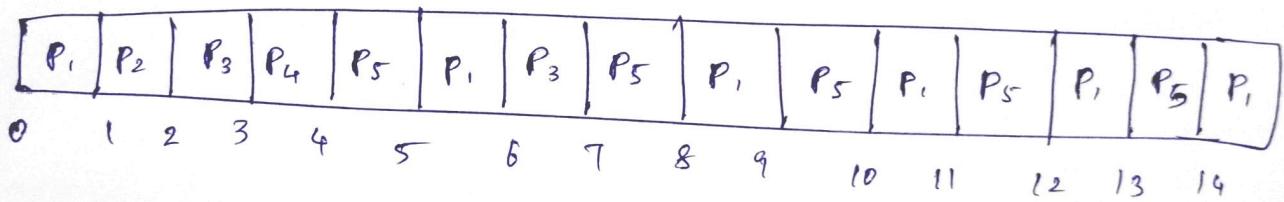
(iii)

P_2	P_5	P_1	P_3	P_4
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Process	ET	Priority	WT	TAT
P_2	10	3	0	1
P_5	1	1	1	6
P_1	2	3	6	16
P_3	1	4	16	18
P_4	5	2	18	19

Total turnaround time = 60 ms
 Average turnaround time = $\frac{60}{5} = 12 \text{ ms}$
 Total waiting time = 31 ms.

(iv)



Process	ET	WT	TAT
P_1	10	$(0 + (5-1) + (8-6) + (10-9)) = 9$	19
P_2	1	$+ (12-11) + (14-13) = 2$	$TWT = 27 \text{ ms}$
P_3	2	$2 + (6-3) = 5$	$7 \quad TTAT = 46 \text{ ms}$
P_4	1	3	4
P_5	5	$(4 + (7-5) + (9-8) + (11-10) + (13-12)) = 9$	4