Operation System

Assignment-1

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19CSE052

1) What is average turn around time for the following process

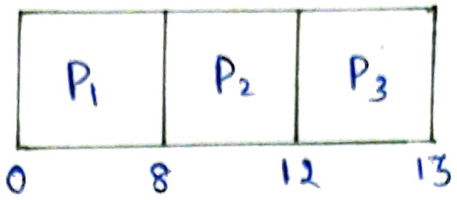
i) using FCFS

ii) Non-preemptive SJF

iii) preemptive SJF

Process	Arrival Time	Burst time
P_1	0	8
P_2	0.4	4
P_3	1	1

i) using FCFS

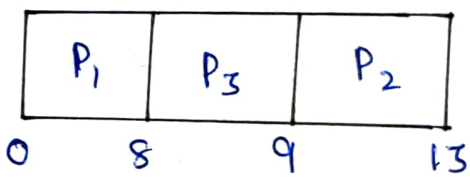


Process	arrival time	Burst time	waiting time	Turnaround time
P_1	0	8	0 - 0 = 0	8 + 0 = 8
P_2	0.4	4	8 - 0.4 = 7.6	4 + 7.6 = 11.6
P_3	1	1	12 - 1 = 11	1 + 11 = 12

Average turn around time $= \frac{8 + 11.6 + 12}{3}$

$= \frac{31.6}{3} = 10.53$ ms

ii) Non preemptive SJF

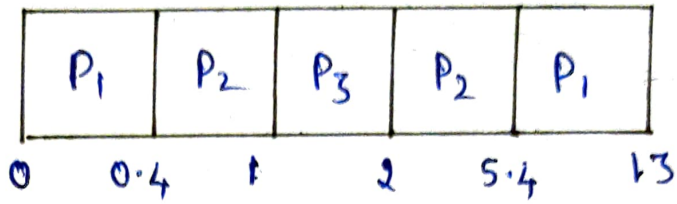


Process	Arrival time	Burst time	waiting time	turn around time
P_1	0	8	0 - 0 = 0	8 + 0 = 8
P_2	0.4	4	9 - 0.4 = 8.6	4 + 8.6 = 12.6
P_3	1	1	8 - 1 = 7	7 + 1 = 8

Average turn around time $= \frac{8 + 12.6 + 8}{3} = \frac{28.6}{3}$

$= 9.53$ ms

iii) preemphive SJF



Process	Arrival time	Burst time	waiting time	Turn around time
P_1	0	8	$[0+(5.4-0.4)]-0$ $= 5$	$8+5=13$
P_2	0.4	4	$[0.4+(2-1)]-0.4$ $=1$	$4+1=5$
P_3	1	1	$[1-1]=0$	$1+0=1$

Average turn around time $= \frac{13+5+1}{3}$

$= 19/3 = 6.33$ ms.

2) Consider the following process with CPU burst time given in milli seconds.

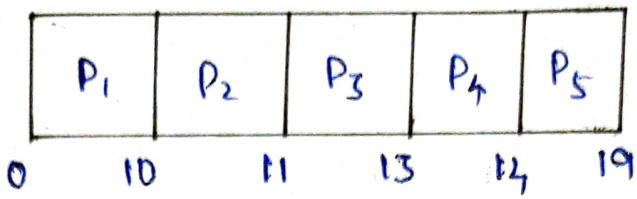
Process	Bursttime	priority
P_1	10	3
P_2	1	1
P_3	2	3
P_4	1	4
P_5	5	2

Process are arrived in all order at time 0.

Draw a gantt chart to show execution using FCFS, SJF Non preemptive priority and round robin Time quantum - 1

Calculate waiting time and turn around time for each scheduling algorithm.

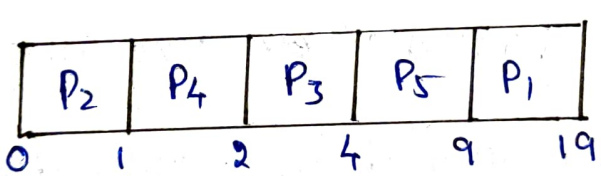
i) FCFS



Process	Execution time	waiting time	Turn around time
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

waiting time = 48 ms.
Turn around time = 67 ms

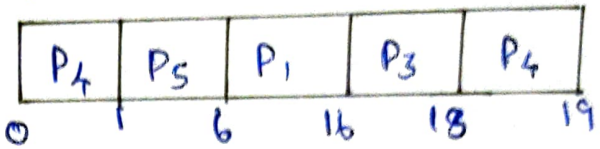
ii) SJF



Process	Execution Time	waiting time	Turn around time
P_1	10	9	10+9 = 19
P_2	1	0	1+0 = 1
P_3	2	2	2+2 = 4
P_4	1	1	1+1 = 2
P_5	5	4	5+4 = 9

Total waiting time = 16 ms
Total turnaround time = 35 ms

iii) Non preemptive priority.

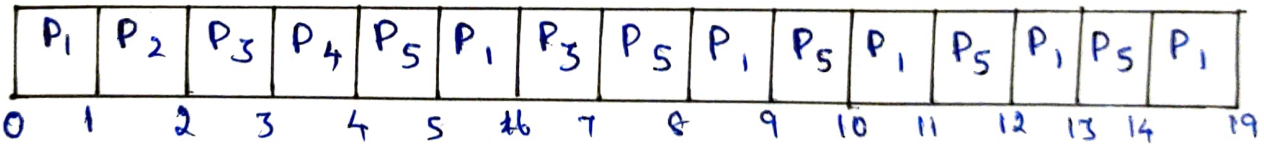


Process	Burst time	priority	waiting time	Turn around time.
P_1	10	3	6	10+6=16
P_2	1	1	0	1+0=1
P_3	2	3	16	2+16=18
P_4	1	4	18	1+18=19
P_5	5	2	1	5+1=6

Total waiting time = 41ms

Total turn around time = 60ms.

iv) Round robin (Time quantum = 1ms)



Process	Execution time	waiting time	Turn around time
P_1	10	0+(5-1)+(8-6)+(10-9)+(12-11)+(14-13)=9	10+9=19
P_2	1	1	1+1=2
P_3	2	2+(6-3)=5	2+5=7
P_4	1	3	1+3=4
P_5	5	4+(7-5)+(9-8)+(11-10)+(13-12)=9	5+9=14

Total turnaround time = 46ms Total waiting time = 27ms.