PRIORITY SCHEDULING,

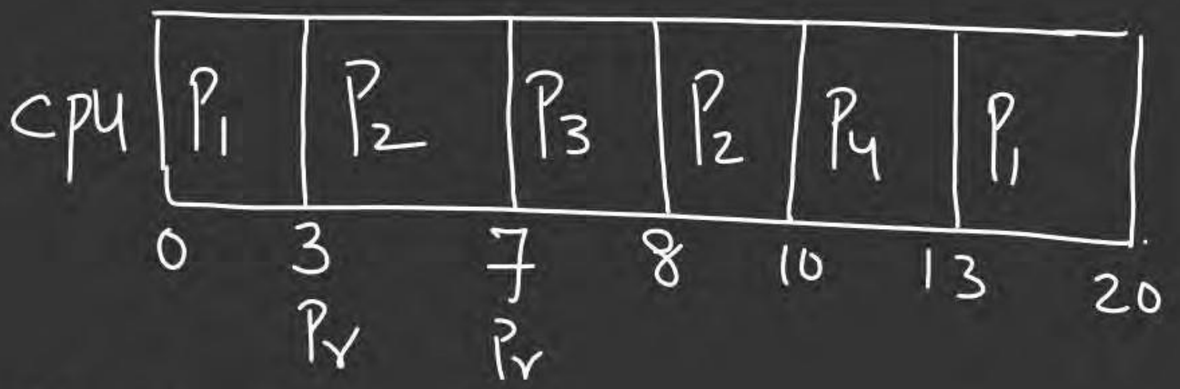
MLFQSA

Q.3 Conslder the following processes, wlth the arrlVal time and the length of the CPU burst given in milllseconds The scheduling algorithm used is preemptive Shortest RemainIng-Time First (SRTF).

The average turnaround time of these processes *1s* milliseconds.

P.No	A.T	B.T
1	0	~~10~~ 7 ✓
×2	3	~~6~~ 2 ✓
×3	7	1
×4	8	3 ✓

SRTF :



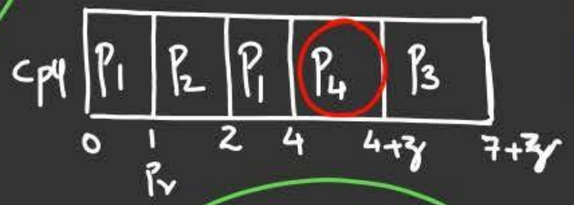
$$\text{Av. TAT} = \frac{20+7+1+5}{4} = \frac{33}{4} = 8.25$$

Q.4 Consider the following four processes wlth arrival times (in milliseconds) and their length of CPU bursts (in milliseconds) as shown below:

These processes are run on a single processor using preemptive Shortest Remaining Time First (SRTF) Scheduling Algorithm. If the average waiting time of the processes is 1 millisecond, then the value of 2 is

SRTF : Av. WT = 1

P.No	AT	B.T
1	0	~~2~~
2	1	1
3	3	3
4	4	3



i. if $(3 < 3)$ ✓

P.N	TAT	W.T
1	4	1
2	1	0
3	4+3	1+3
4	3	0

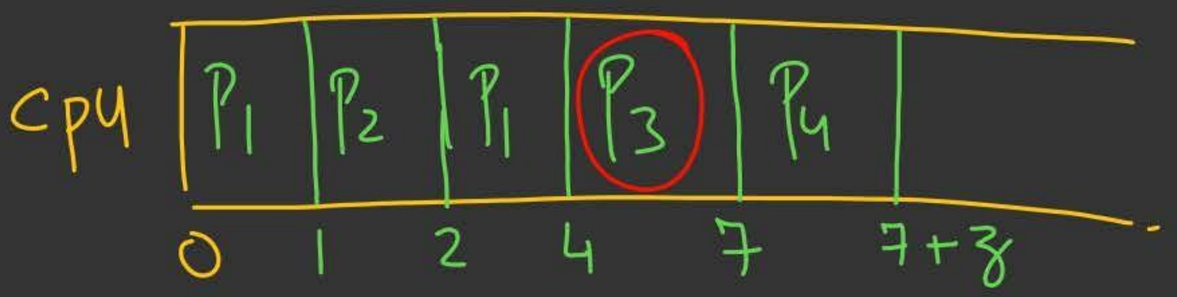
$Av.WT = \frac{1+0+1+3+0}{4}$

$4 = 3+2$

$\therefore 3 = 2$ ✓

2m

ii. if $(3 > 3)$ ×



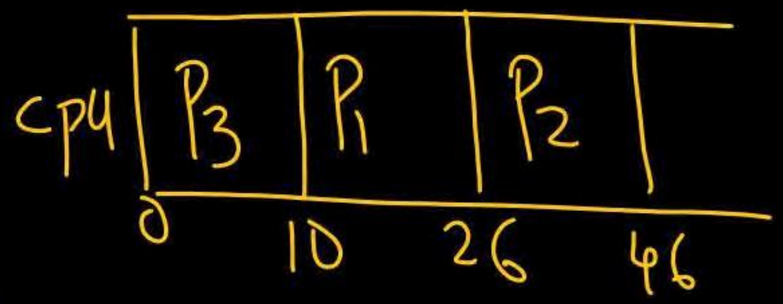
P.No	TAT	W.T
1	4	1
2	1	0
3	4	1
4	3+3	3
		5

$Av.WT = \frac{5}{4} = 1.25$ ✓

Q. 5 3 hree l*rocesses arrive at time zero with CPU bursts of 16, 20 and 10 milliseconds. lf the scheduler has prior knowledge about the length of the CPU bursts, the mini u die average in e for these three processes in a N n ree t e Schedtller (rounded to nearest lnteger) is milliseconds. gp

10 - 26 — 1 — 0 — 16
26 - 46 — 2 — 0 — 20
0 - 10 — 3 — 0 — 10
36

36 / 3 ≈ 12 ✓



5) Highest Response Ratio Next (HRRN)

Sel. Criteria: Response Ratio (RR) $= \frac{W+S}{S}$

W = waiting time of Process so far

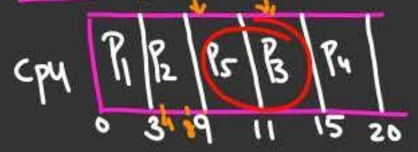
S = Service Time

Mode of opn: Non-Preemptive

[Not only favor Shorter Process, but also limit the waiting time of longer Process]

P.No	A.T	B.T
1	0	3
2	2	6
3	4	4
4	6	5
5	8	2

SJF: (favor shorter Process, Starv. to P3)



@ t_0: ~~P1~~; ✓

@ t_3: ~~P2~~; ✓

@ t_9: ~~P3~~; P4; P5

@ t_{13}: P4; P5

$RR_4 = \frac{7+5}{5} = \frac{12}{5}$

$RR_5 = \frac{5+2}{2} = \frac{7}{2}$ ✓

$RR_3 = \frac{5+4}{4} = \frac{9}{4}$ ✓

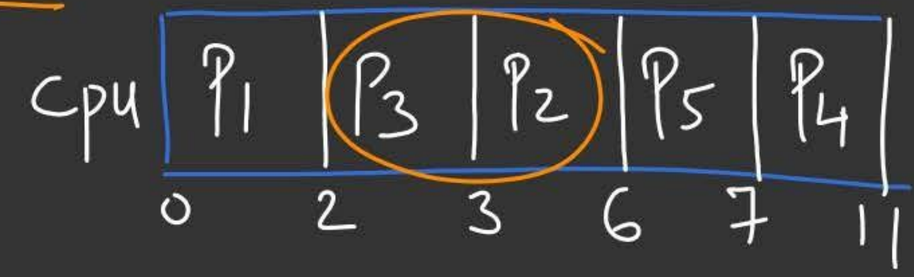
$RR_4 = \frac{3+5}{5} = \frac{8}{5}$

$RR_5 = \frac{1+2}{2} = \frac{3}{2}$

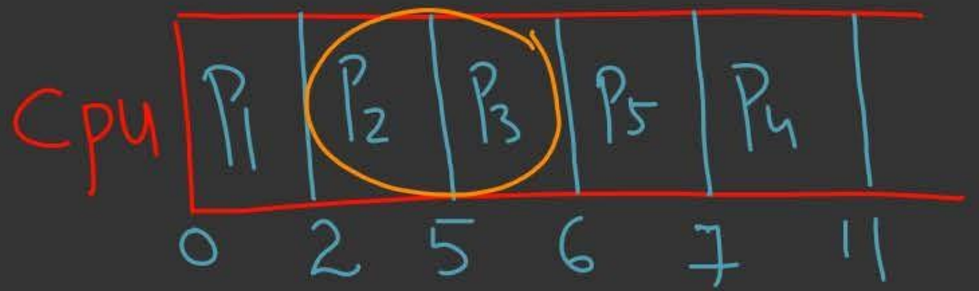
HRRN:

P.No	A.T	B.T
1	0	2
2	1	3
3	2	1
4	3	4
5	5	1

SJF



HRRN:



@t_0: ~~P1~~;

@t_2: ~~P2~~; P3;

$RR_2 = \frac{1+3}{3} = \frac{4}{3}$ ✓

$RR_3 = \frac{0+1}{1} = 1$

@t_5: ~~P3~~; P4; P5

$RR_3 = \frac{3+1}{1} = 4$ ✓

$RR_4 = \frac{2+4}{4} = 6/4 = 1.5$

$RR_5 = \frac{0+1}{1} = 1$

@t_6: P4; P5

$RR_4 = \frac{3+4}{4} = \frac{7}{4} = 1.75$

$RR_5 = \frac{1+1}{1} = 2$ ✓

6. Priority based Scheduling :

- indicate the level of importance of the process;
- is Computed as an integer value;

Sel. Criteria : Priority ✓

Mode of opn : N-Pr | Pr

f(Type ; Size ; Resources-use, - - -)

Int_value = Priority

Static → Starvation

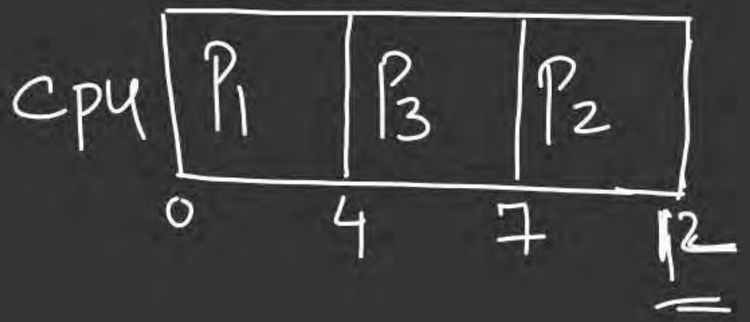
Dynamic → Aging Algo

"The working of Priority based Scheduling is same as SJF/SRTF, except that we use Priority value instead of B.T"

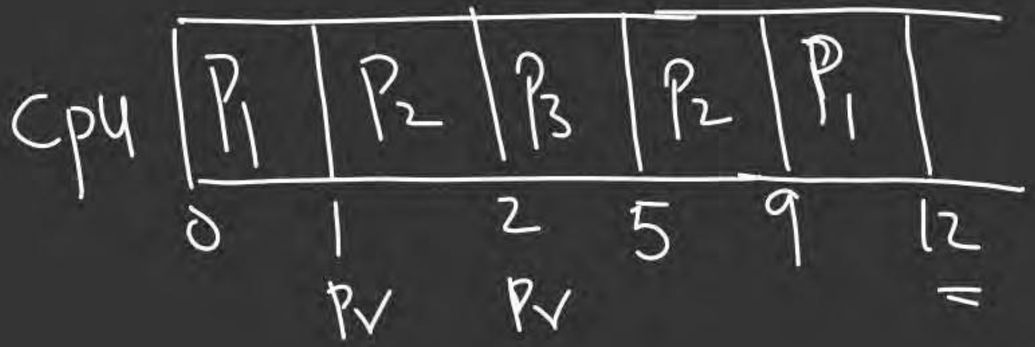
Prio	P.No	A.T	B.T
4	1	0	4
5	2	1	5
8	3	2	3

Higher no. is higher Priority

1) N-Pr-Prio

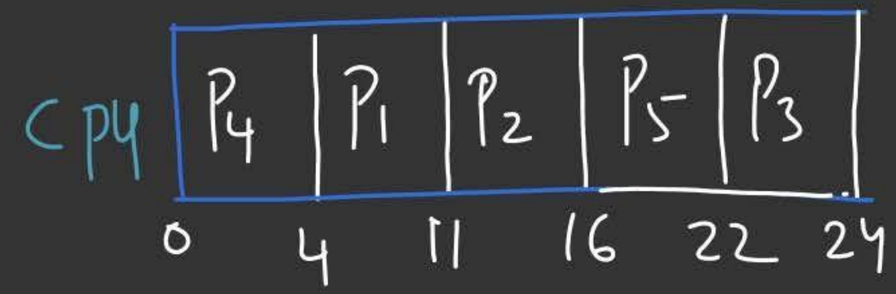


2) Pr-Prio



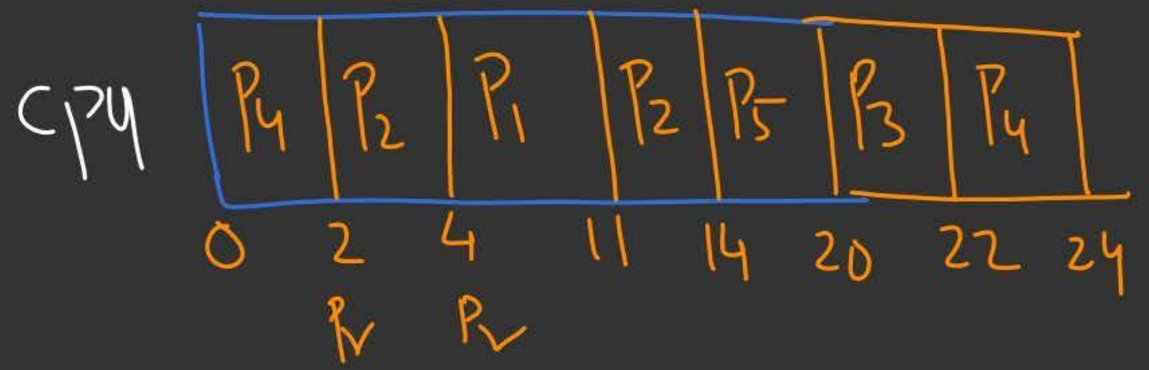
Prio	P.NO	A.T	B.T
× 8	1	4	7
7	2	2	5
6	3	6	2
4	4	0	4
7	5	3	6

N-Pr-Prio



Pr-Prio

<4;2;1;2;5;3;4>



Q.6 Consider a System with Preemptive I*riority based Schedullng with 3 1^rocesses P1, P2, 1*3 having lnfinite lnstances of them. ’1’he instances of these Processes arrive at regular intervals of 3, 7 & 20 ms respectively. the priority of the Process instances is the inverse of their periods. Each of the i*rocess instance l*1, 1*2, P3 consumes 1, 2 & 4 ms of CI*U time respectively. 3’he 1st instance of each l*rocess is available at What is the Completion time of the 1st instance of l*rocess P3?

End of Session : 30/10/2022