Scheduling

1. FCFS (Non preemptive)
2. SJF (SPN) (Non preemptive)] Starvation.
3. SRTF (Preemptive).
4. Highest Response Ratio Next (HRRN).

Non-preemptive.

Normalized Turnaround Time $= \frac{Tr}{Ts}$ ← Turnaround Time. ← Service Time

minimize ~~T~~ Normalised Turnaround time

$$R = \frac{W + S}{S}$$ response ratio

W: time spent waiting

S: Service time

Policy: Select process with highest R.

Adv: No starvation

Favors ~~short~~ processes with short service Times

5 Round Robin Scheduling

Preemptive based on a clock.

Time slice / quantum : time given to each process before an interrupt happens.

How to choose the quantum?

Long	Short
performance approaches FCFS	* overhead due to context switching * shorter process will move faster.

n processes.

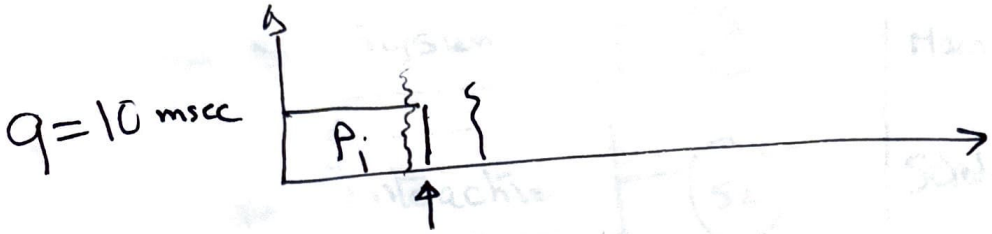
q quantum.

Maximum wait time = $(n-1)q$.

Each process gets $\frac{1}{n}$ of the CPU time

If q is very small, in theory, each process appears to have its own CPU that runs $\frac{1}{n}$ the speed of the CPU.

80% of the CPU burst should be shorter than a quantum.



6 Priority Scheduling

Select process with highest Priority.

0 ⟶ 127 } Internal vs. External.

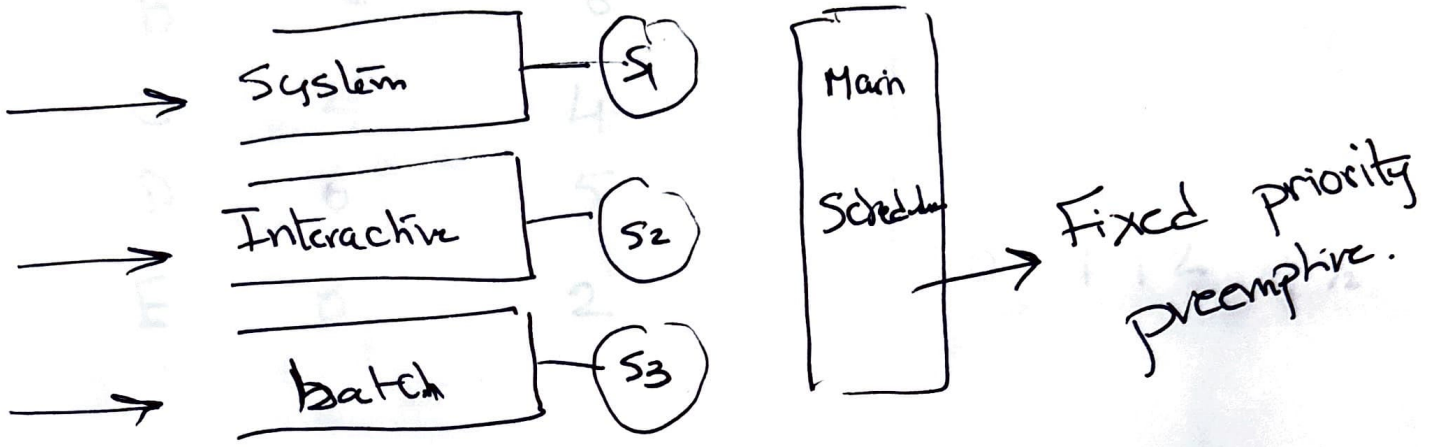
high ⟶ low.

Starvation can happen.

Soln : Aging : Increase priority as processes wait.

[7] Multilevel Queue Scheduling

[4]



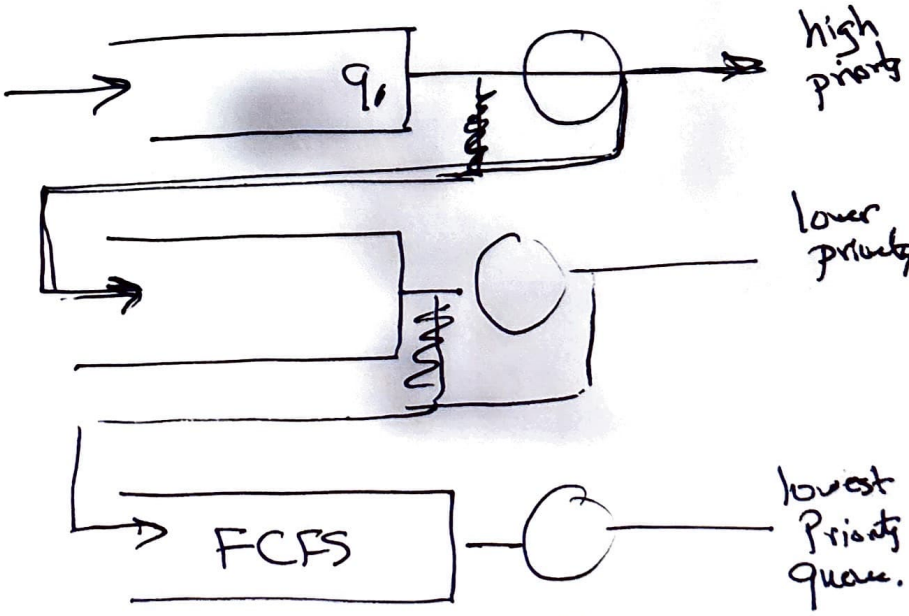
Classify processes into groups.

Each group is assigned a particular Ready Queue.

A main scheduler should be priority-based and preemptive.

[8] Multilevel Feedback Queue Scheduling

Penalize processes that have been running the longest.

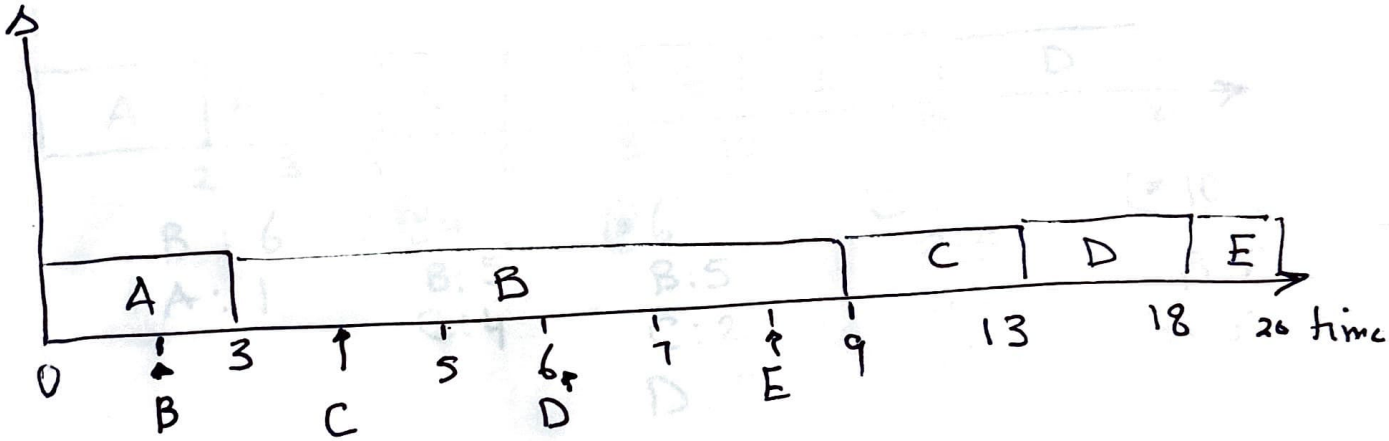


Ex

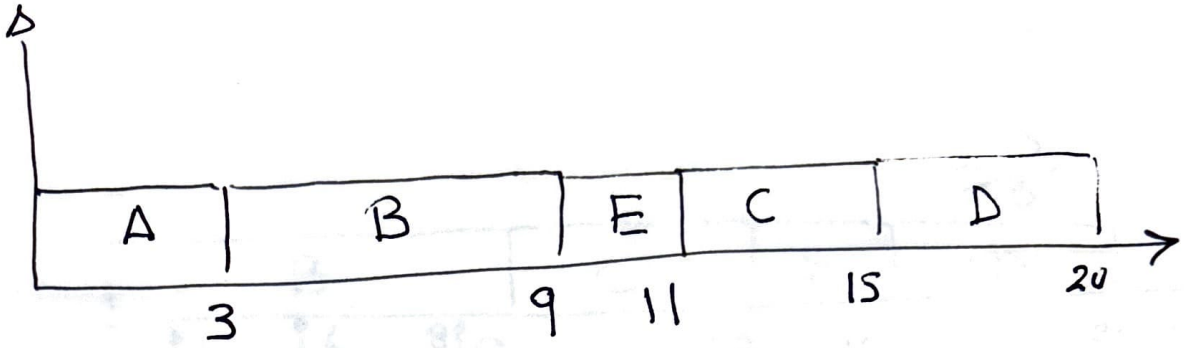
	Arrival time	Service Time (CPU burst)	Finish Time	Turnaround Time	Normalized Turnaround Time.
A	0	3	3	3	3/3
B	2	6	9	7	7/6
C	4	4	13	9	9/4
D	6	5	18	12	12/5
E	8	2	20	12	12/2

5

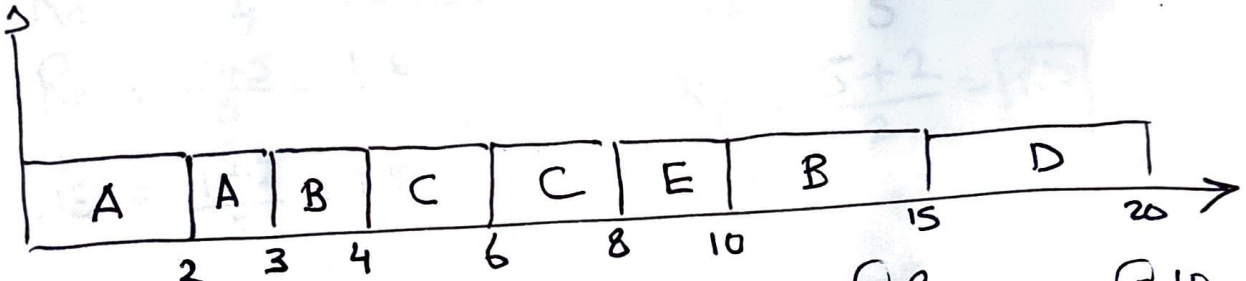
1 FCFS



2] SJF (Non preemptive)



3] SRTF (Preemptive).



B : 6
A : 1

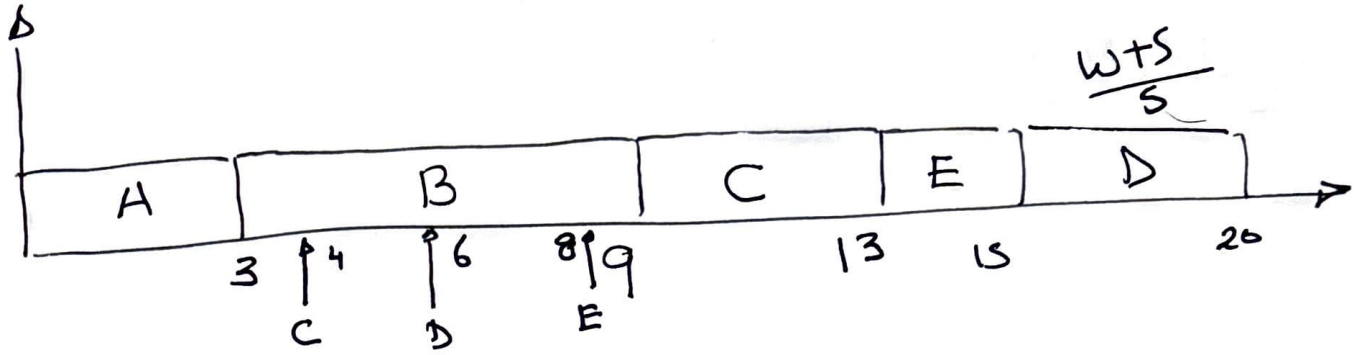
@4
B: 5
C: 4

@6
B: 5
C: 2
D: 5

@8
B: 5
D: 5
E: 2

@10
B: 5
D: 5

HRRN (Non preemptive).



@9:

$R_C = \frac{5+4}{4} = \boxed{2.25}$

$R_D = \frac{3+5}{5} = 1.6$

$R_E = \frac{1+2}{2} = 1.5$

@13

$R_D = \frac{7+5}{5} = 2.4$

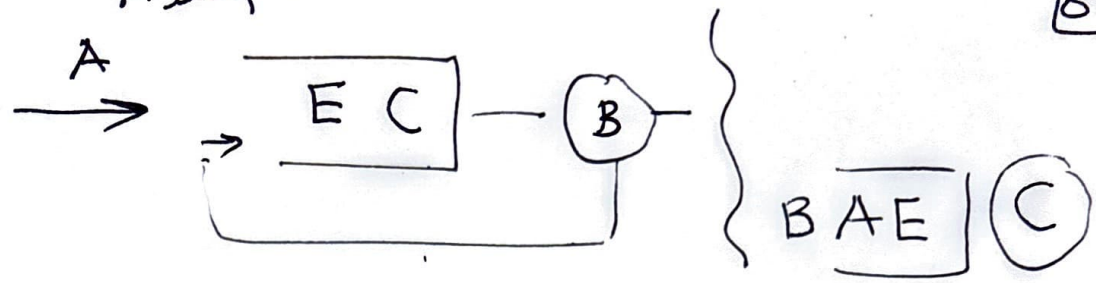
$R_E = \frac{5+2}{2} = \boxed{3.5}$

R.R

R.R

Assumption

8



q=1