CPU SCHEDULING?

OPERATING SYSTEM

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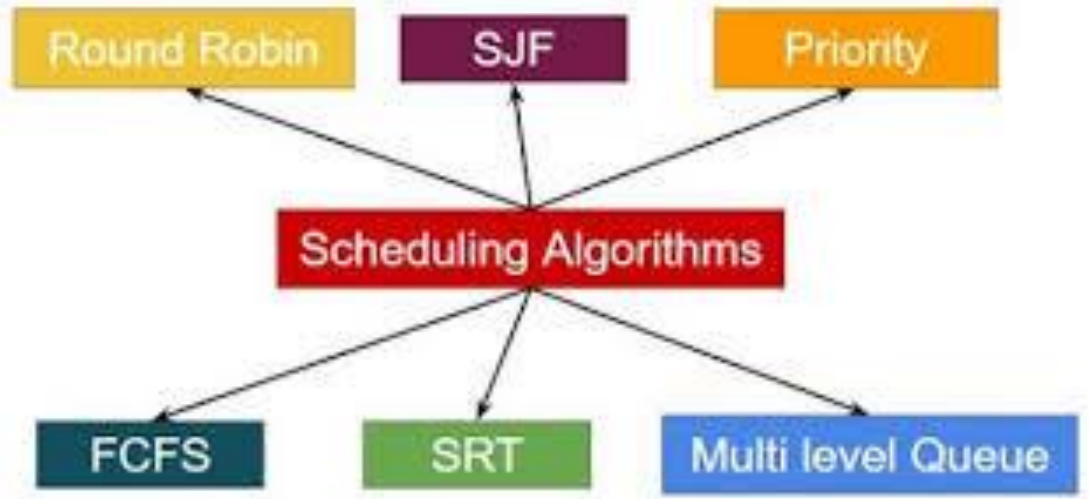
WHAT IS CPU SCHEDULING?

- Way of Selecting a process from ready queue and putting it into the CPU
- Ready queue in RAM is in which processes are ready to be executed



Pre-Emptive

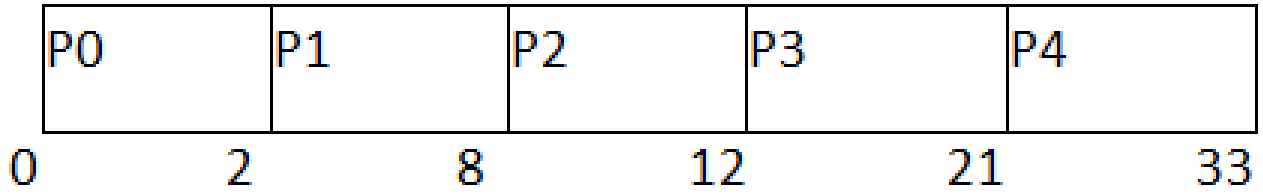
- A process from ready queue is put into the CPU to be executed.
- And can be put back to the ready queue to be executed later.
- Reasons can be time slice, priority, shortest process first etc.

Non Pre-Emptive

- A process from ready queue is put into the CPU to be executed
- Process will completely be executed taking its actual burst time

FIRST COME FIRST SERVE [non pre-emptive]

First come first serve (FCFS) scheduling algorithm simply schedules the jobs according to their arrival time. The job which comes first in the ready queue will get the CPU first. The lesser the arrival time of the job, the sooner will the job get the CPU. FCFS scheduling may cause the problem of starvation if the burst time of the first process is the longest among all the jobs.



Process ID	Arrival Time	Burst Time
0	0	2
1	1	6
2	2	4
3	3	9
4	6	12

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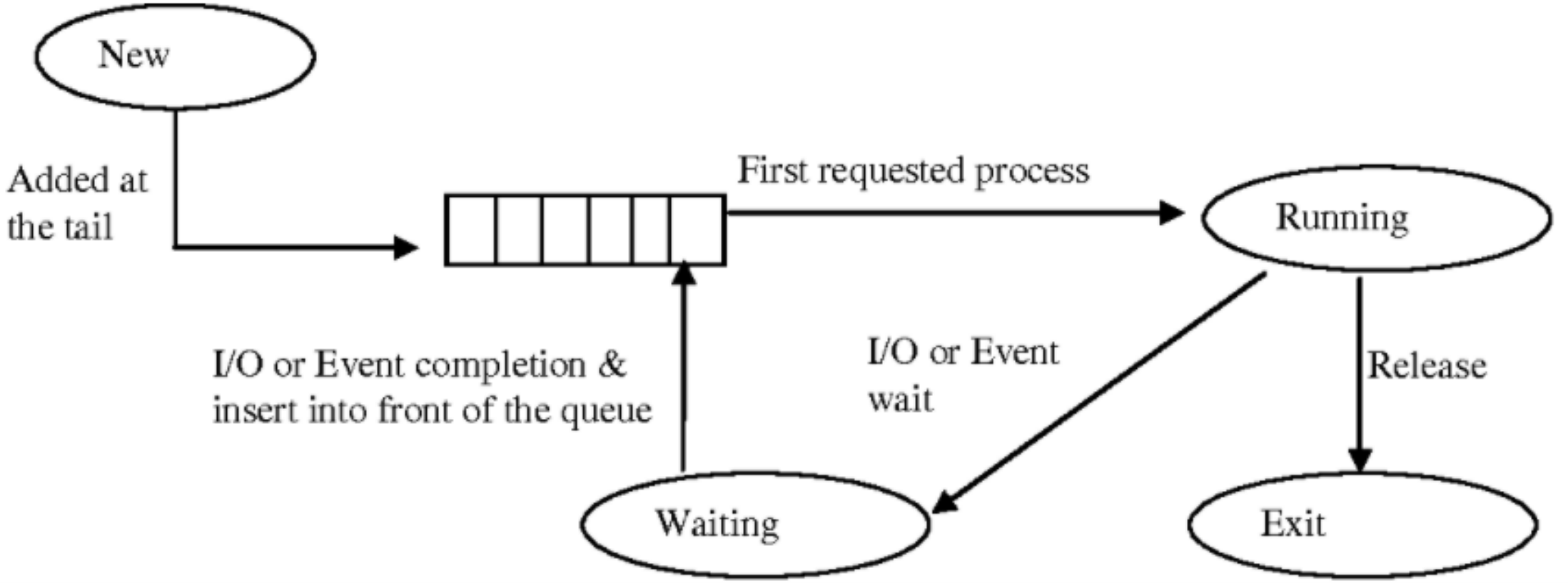
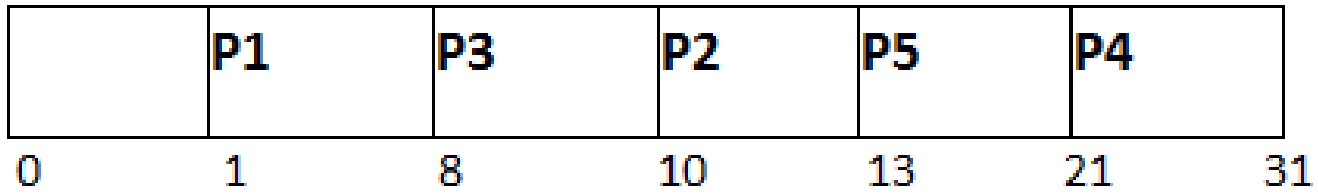

New
Added at the tail
First requested process
Running
I/O or Event completion & insert into front of the queue
I/O or Event wait
Release
Waiting
Exit

SHORTEST Job First [non pre-emptive]

In SJF scheduling, the process with the lowest burst time, among the list of available processes in the ready queue, is going to be scheduled next.



PID	Arrival Time	Burst Time
1	1	7
2	3	3
3	6	2
4	7	10
5	9	8

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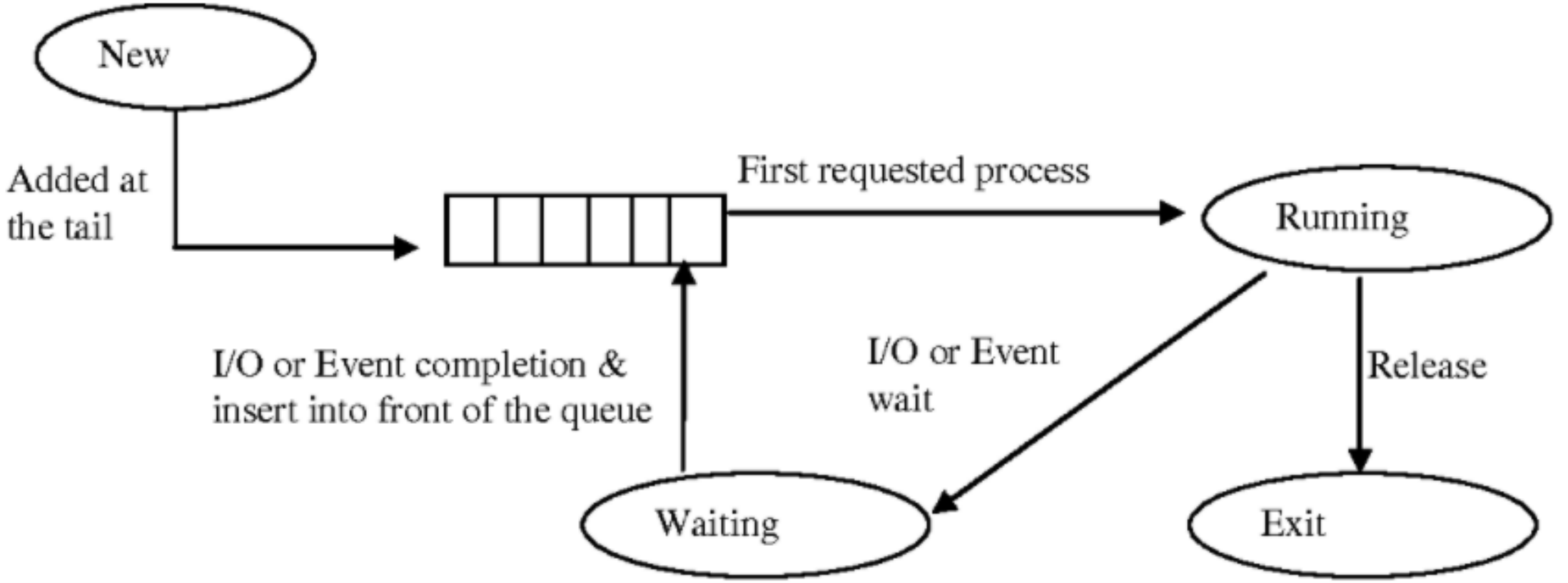
New
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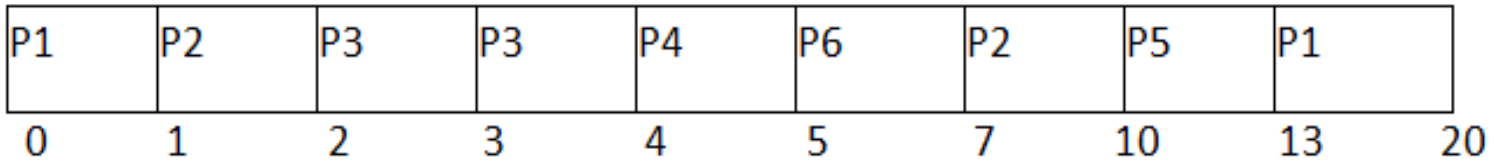
SHORTEST REMAINING TIME FIRST [pre-emptive]

This Algorithm is the **preemptive version** of **SJF scheduling**. In SRTF, the execution of the process can be stopped after certain amount of time. At the arrival of every process, the short term scheduler schedules the process with the least remaining burst time among the list of available processes and the running process.



Process ID	Arrival Time	Burst Time
1	0	8
2	1	4
3	2	2
4	3	1
5	4	3
6	5	2

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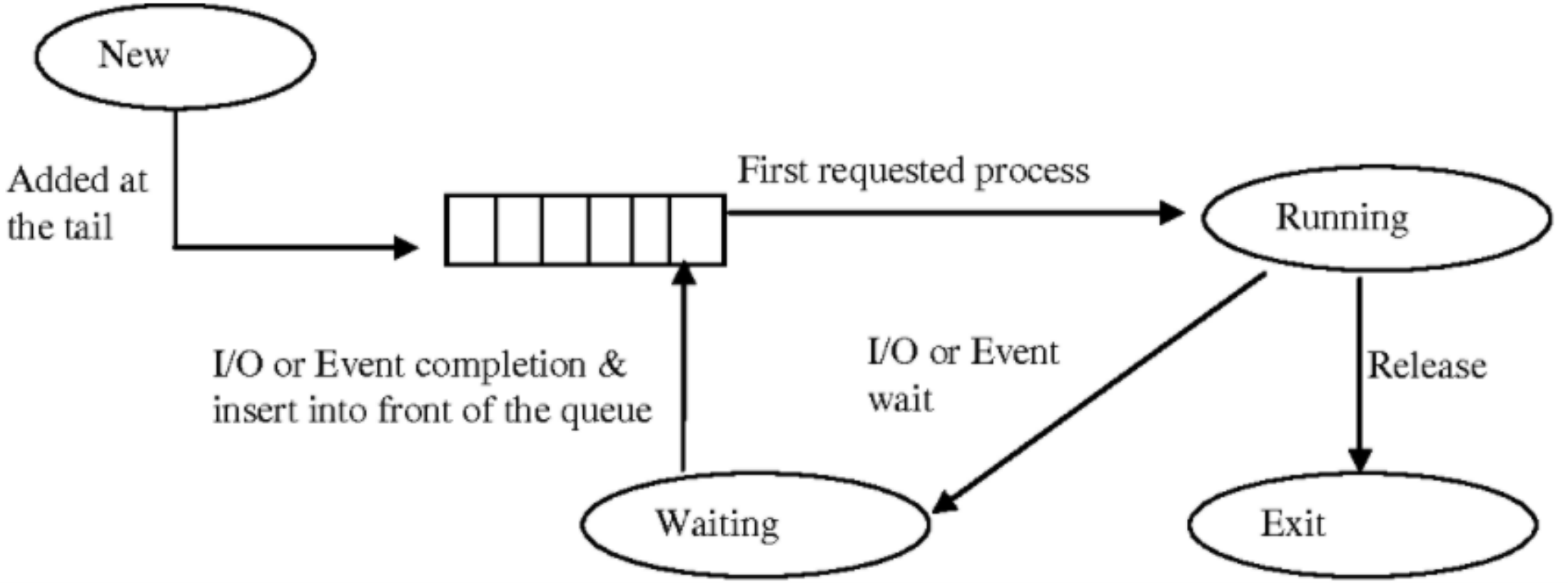
New
Added at the tail
First requested process
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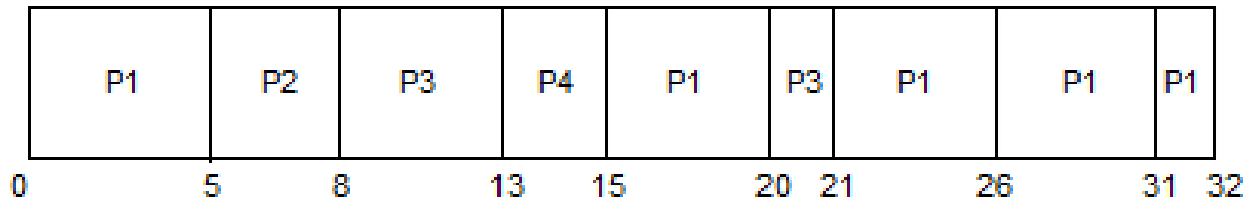
I/O or Event completion & insert into front of the queue
I/O or Event wait
Release
Waiting
Exit

ROUND robin [pre-emptive]

Round robin is the oldest, simplest scheduling algorithm. The name of this algorithm comes from the round-robin principle, where each person gets an equal share of something in turn. It is mostly used for scheduling algorithms in multitasking. This algorithm method helps for starvation free execution of processes.



The average waiting time will be, 11 ms.

PROCESS	BURST TIME
P1	21
P2	3
P3	6
P4	2

The GANTT chart for round robin scheduling will be,

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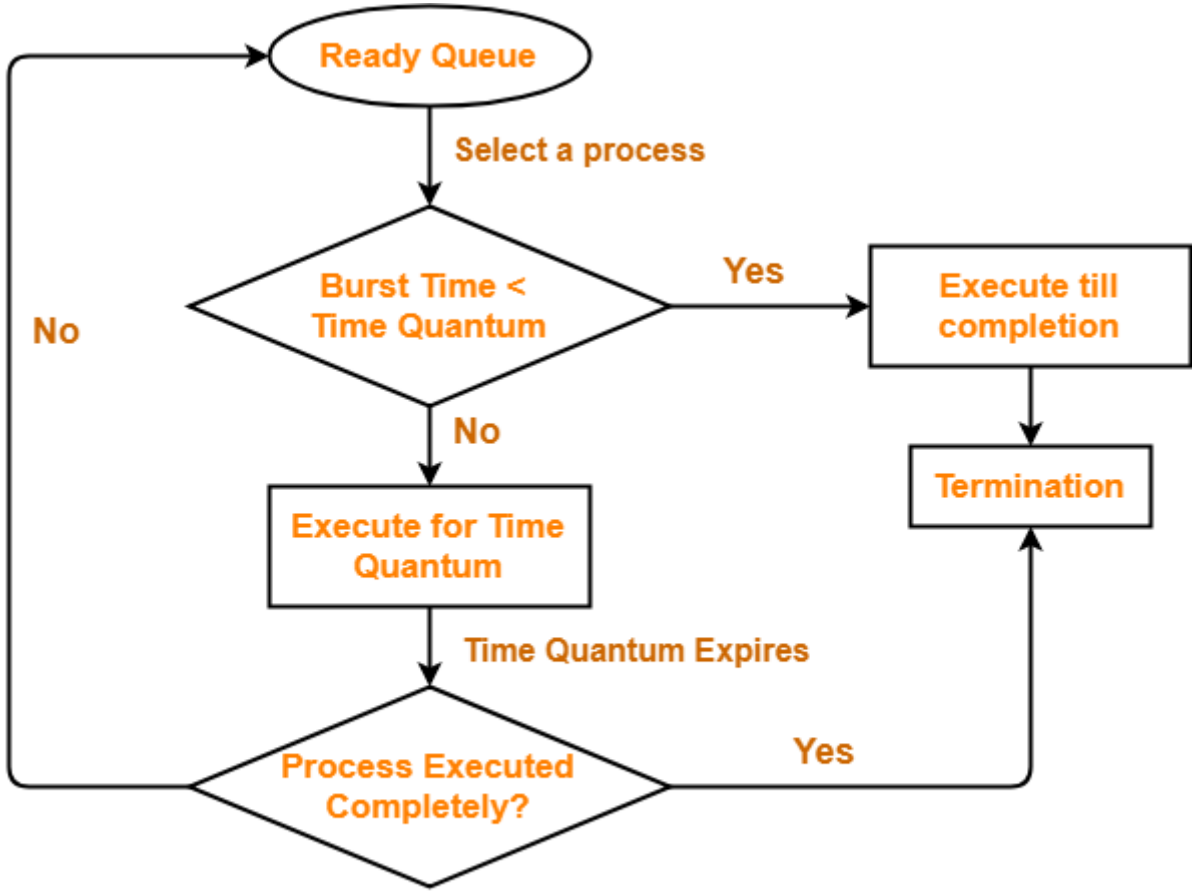
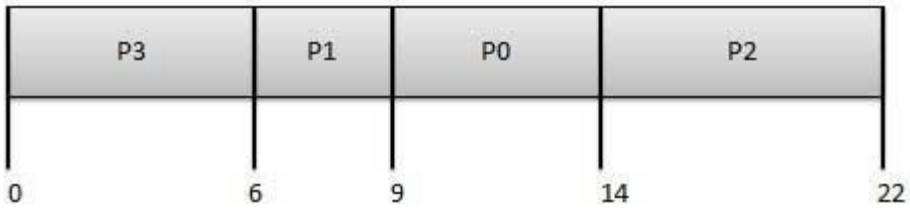


Round Robin Scheduling

PRIORITY Scheduling

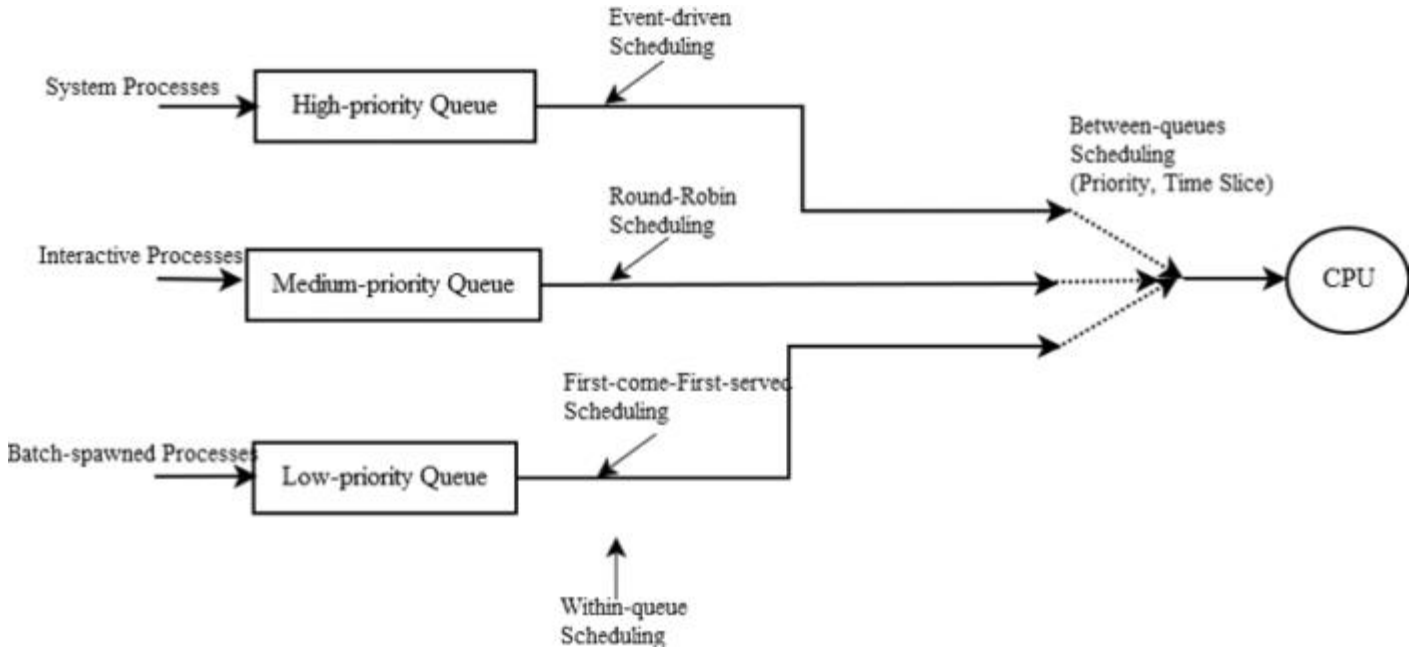
Priority scheduling is a method of scheduling processes based on priority. In this method, the scheduler selects the tasks to work as per the priority.

Process	Arrival Time	Execute Time	Priority	Service Time
P0	0	5	1	9
P1	1	3	2	6
P2	2	8	1	14
P3	3	6	3	0



Multi Level Scheduling

This algorithm separates the ready queue into various separate queues. In this method, processes are assigned to a queue based on a specific property of the process, like the process priority, size of the memory, etc.



Thank You!

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