Name: Nimra Nasir
Reg No: 19-CP-35

Operating System

Lab : 11

Priority Scheduling Algorithm:

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

The processes with higher priority should be carried out first, whereas jobs with equal priorities are carried out on a round robin or FCFS basis. priority depends on memory requirement, time requirement.

Two types.

1- Preemptive scheduling
2- Non-preemptive scheduling

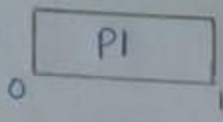
Preemptive Scheduling:

Example:

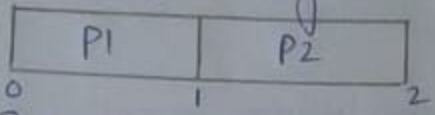
There are 7 processes P1, P2, P3 ..... P7 given. Their respective priorities, arrival times and burst times are given in table.

Process Id	Priority	Arrival Time	Burst Time
1	2 (L)	0	1
2	6	1	7
3	3	2	3
4	5	3	6
5	4	4	5
6	10 (H)	5	15
7	9	15	8

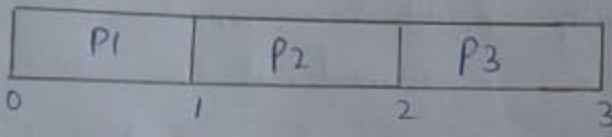
Step 1: At tim=0, P1 arrives with the burst time of 1 units and priority 2. Since no other process is available hence this will be scheduled till next job arrives or its completion



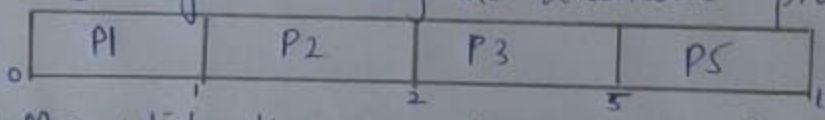
Step 2: At time =1, P2 arrives. P1 has completed its execution and no other process is available at this time hence the operating system has to schedule it regardless of the priority assigned to it.



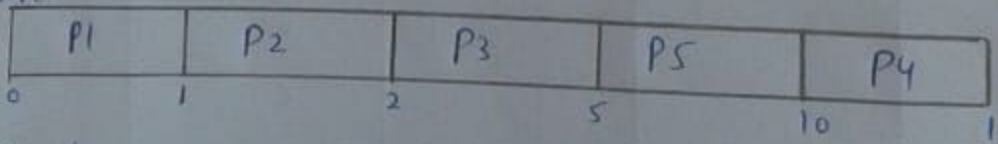
Step 3: The next process P3 arrives at time unit = 2, the priority of P3 is higher to P2. Hence the execution of P2 will be stopped and P3 will be scheduled on the CPU.



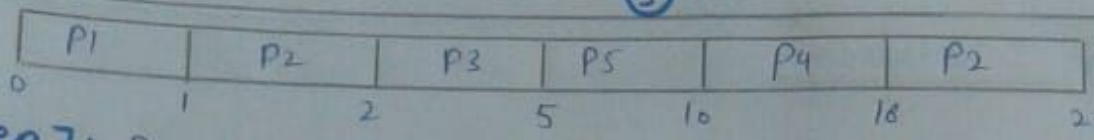
Step 4: During the execution of P3, three more processes P4, P5 and P6 becomes available. Since, all these three have the priority lower to the process in execution so P5 can't preempt process P3 will complete its execution and then P5 will be scheduled with the priority highest among the available processes.



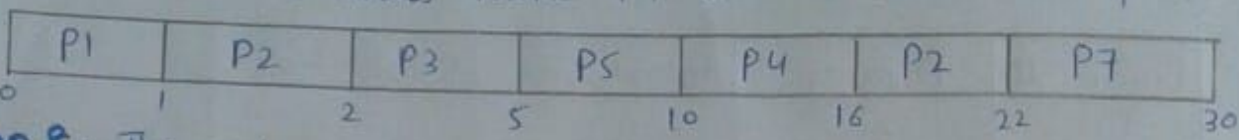
Step 5: Meanwhile the execution of P5, all the processes got available in the ready state. At this point, the algorithm will start behaving as Non-preemptive scheduling. all processes available in ready queues OS tak the process with the highest priority and execute that process till completion. then P4 will be scheduled and will be executed till the completion.



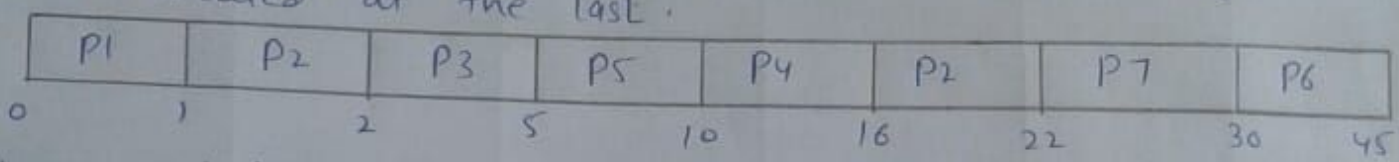
Step 6: P4 is completed, the other process with the highest priority available in the ready queue is P2. Hence P2 will be Scheduled next



Step 7: P2 is given the CPU till the completion since its remaining burst time is 6 units hence P7 will be scheduled after this.



Step 8: The only remaining process is P6 with the least priority the operating system has no choice unless of executing it. This will be executed at the last.



Turn around time = Completion Time − Arrival time
Waiting Time = Turn Around Time − Burst time

Process Id	Priority	Arrival Time	Burst Time	Completion time	Turn around Time	Waiting Time
1	2	0	1	1	1	0
2	6	1	7	22	21	14
3	3	2	3	5	3	0
4	5	3	6	16	13	7
5	4	4	5	10	6	1
6	10	5	15	45	40	25
7	9	6	8	30	24	16

Avg waiting Time = $(0 + 14 + 0 + 7 + 1 + 25 + 16)/7$

$= 63/7$

$= 9$ units

Non-preemptive Scheduling:

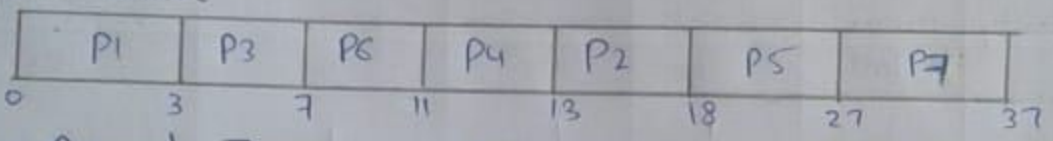
Example:

There are 7 processes P1, P2 ..... P7. Their arrival Time, and burst time are given.

Process ID	Priority	Arrival time	Burst time
1	2	0	3
2	6	2	5
3	3	1	4
4	5	4	2
5	7	6	9
6	4	5	4
7	10	7	10

Answer:

Gantt chart



Turn Around Time = Completion time − Arrival time

Waiting time = Turn Around time − Burst time.

Process Id	Priority	Arrival time	Burst time	completion time	Turn around time	waiting time	response time
1	2	0	3	3	3	0	0
2	6	2	5	18	16	11	13
3	3	1	4	7	6	2	3
4	5	4	2	13	9	7	11
5	7	6	9	27	21	12	18
6	4	5	4	11	6	2	7
7	10	7	10	37	30	18	27

Avg waiting time = (0+11+2+7+12+2+18)/7

= 52/7 units.