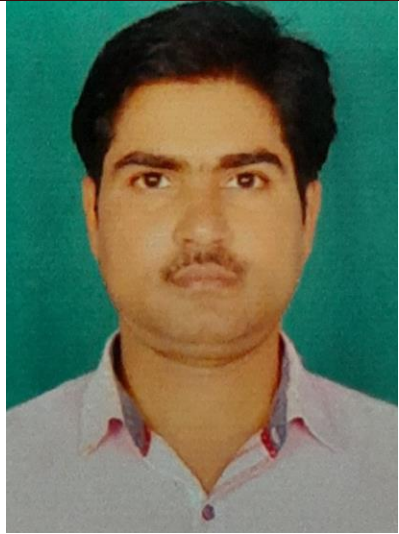




Operating system

Class-BCA III Semester



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OUTLINE-

UNIT :- II

CPU Scheduling

First come First serve (FCFS)

Shortest Job First

Priority

Round Robin (RR)

CPU SCHEDULING

It is the change of ready state to running state of the process. CPU scheduler selects process among the processes that are ready to execute and allocates CPU to one of them. Short term scheduler also known as dispatcher, execute most frequently and makes the fine grained decision of which process to execute next.

CPU scheduling decisions may take place when a process:

- Switches from running to waiting state.
- Switches from running to ready state.
- Switches from waiting to ready.
- Terminates

Scheduling Criteria

- ❖ **CPU utilization** : keep the CPU as busy as possible.
- ❖ **Turn around Time**: amount of time to execute a particular process.
- ❖ **Waiting time** : amount of time a process has been waiting in the queue.

- ❖ **Response time** : amount of time it takes from when a request was submitted until the first response is produced not output.



Scheduling Algorithm Optimization Criteria

- Maximum CPU utilization.
- Max throughput.
- Minimum turn around time.
- Minimum waiting time.
- Minimum response time

Operating System Scheduling algorithms

- First Come First Serve (FCFS) Scheduling
- Shortest-Job-First (SJF) Scheduling
- Priority Scheduling
- Round Robin(RR) Scheduling
- Multilevel Queue Scheduling



First-Come ,First-Served(FCFS)Scheduling

Since CPU gets a lot of processes to handle. So in FCFS CPU will take the first process in the list and will process it then it will take the second process and so on. For example let there be three processes:

PROCESSES	BURSTS TIME
P1	24
P2	3
P3	3



Suppose that the processes arrive in order p₁,p₂,p₃

So the waiting time for p₁=0,p₂=24,p₃=27

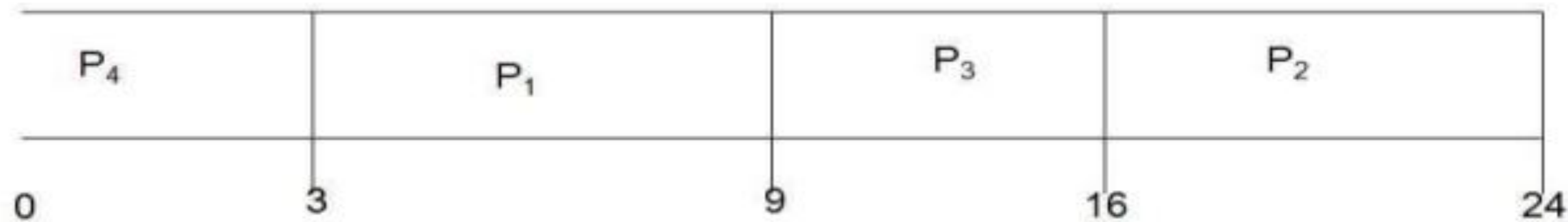
The average waiting time= $(0+24+27)/3=17$.

One of the major drawback of this scheme is that the Average waiting time is often quite long.

Shortest-Job-First(SJF)Scheduling

It is best approach to minimize waiting time. it
Selects the waiting process with the smallest
execution time to execute next.

Processes	Bursts time
P1	6
P2	8
P3	7
P4	3



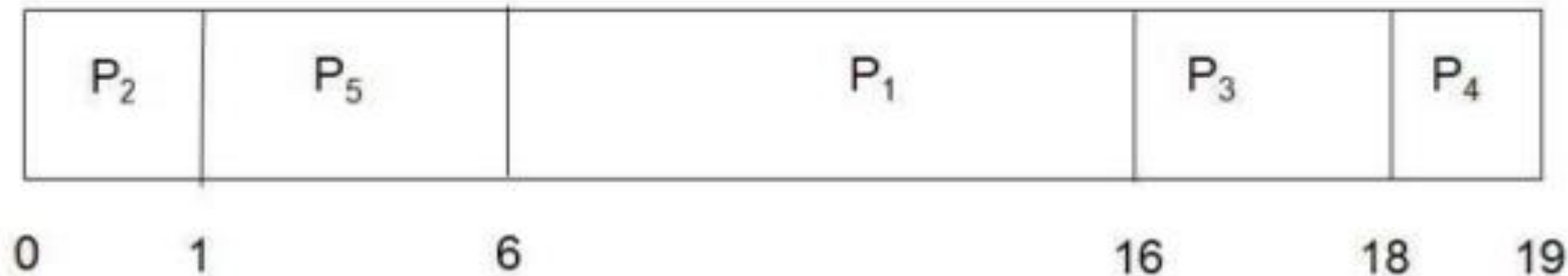
Average waiting time = $(3 + 16 + 9 + 0) / 4 = 7$.

The disadvantage of using SJF is that the total execution time of a job must be known before execution, while it is not possible to perfectly predict execution time.

Priority Scheduling

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

Processes	Burst time	Priority
P1	10	3
P2	1	1
P3	2	4
P4	1	5
P5	5	2



Average waiting time = $(6+0+16+18+1)/5 = 8.2$

The drawback of priority scheduling is starvation of low priority process.

Round Robin (RR)

In the round robin scheduling, processes are dispatched in a FIFO manner but are given a limited amount of CPU time called a time-slice or a quantum.

If a process does not complete before its CPU-time expires, the CPU is preempted and given to the next process waiting in a queue. The preempted process is then placed at the back of the ready list.

SUMMARY

A CPU Scheduling Mechanism Should

- Favour short jobs.
- Favour I/O bound jobs to get good I/O device utilization.
- Determine the nature of a job and schedule accordingly.

QUESTIONS:-

- 1. What is the CPU Scheduling?**
- 2. How many types of CPU Scheduling explain it with example?**
- 3. Which type of CPU Scheduling is the best and how?**
- 4. What is the difference between throughput and waiting time?**

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Thanks