Course:- B.tech (CSE) Sec:- B

Subject Name:- Operating System

Univ. Roll no:- 2215000094

Class Roll no:- 3

Name:- Aditya Gupta

# Assignment Sheet-1

**Solution 1:-** Cache memory is a type of high-speed memory that is built into the processor of a laptop. It's main purpose is to store frequently used data and instructions for quick access by the processor. This allows the laptop to perform tasks faster and more efficiently.

While Cache memory is useful and important, it cannot replace other type of memory in a laptop. This is because Cache memory has a limited capacity and can only store a small amount of data. In Comparison, RAM and hard disk.

**Solution 2:-** Given line of code contain 2 process in a for loop.

2 × 4 (for loop runs 4 times) ⇒ 8 (total no. of process).

**Solution 3:-** **Priority and SJF:-** Priority scheduling assigns a priority value to each process and the process with the heigher priority is executed first. In SJF scheduling execute the process with the shortest burst time first. Both of these algorithms are non-preemptive.

**Multilevel Feedback Queues and FCFS:-** The relationship b/w these two set of algorithm is that FCFS can be seen as a special case of MLFQ with only one queue. In this case, all processes have the same priority and are executed in the order they arrive, similar to FCFS scheduling

Priority and FCFS:- In priority scheduling, the priority value can be based as various factors, such as the process's arrival time. when the priority value is based on the processes arrival time, priority scheduling becomes equivalent to FCFS scheduling.

RR and SJF:- In RR, scheduling can be seen as a generalization of SJF scheduling. In RR scheduling. In RR scheduling, the time quantum can be set to a very large value, effectively making it equivalent to SJF scheduling.

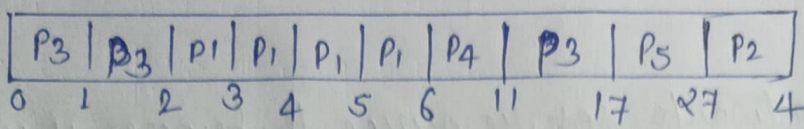
Solution 5:- a) For the office desktop computers, I would recommend a client operating system. This type of operating system is designed for individual users and is user-friendly, making it easy for employees to navigate and use. It also supports common office software such as Microsoft office.

b) For server in the office, I would recommend a server operating system. This type of operating system is specially designed to handle multiple user connections and provide file sharing capabilities

c) For the specialized task of monitoring and controlling manufacturing equipment, I would recommend a real-time system. This type of system is designed for time-sensitive tasks and can quickly-respond to events in real-time.

Solution 6:-

| Process | Burst time | Arrival time |
|---|---|---|
| P1 | 3 | 2 |
| P2 | 13 | 3 |
| P3 | 6 | 0 |
| P4 | 4 | 5 |
| P5 | 10 | 7 |




| Completion time | TAT | WT |
|---|---|---|
| 7 | 5 | 0 |
| 40 | 37 | 24 |
| 17 | 17 | 9 |
| 11 | 6 | 2 |
| 27 | 26 | 16 |

avg. TAT = $\frac{91}{5}$ = 18.2 ms

avg. WT = $\frac{51}{5}$ = 10.2 ms

Solution-8

## Process states

Processes on a multi-user server can be in one of the following state.

i) New :- when a process is first created, it is in the 'New' state.

ii) Ready :- one the process has been initialized, it moves to the ready state.

iii) Running :- when the CPU starts executing the processes instructions it moves to the running state.

iv) Blocked :- If a process needs to wait for a resource, such as a network resource, it moves to the 'Blocked' state.

v) Terminated :- when a process completes its execution, it moves to the 'terminated' state.

## Addressing a Issue.

i) Identify the specific process that is stuck in the Blocked state. this can be done by using system monitoring tools or by checking

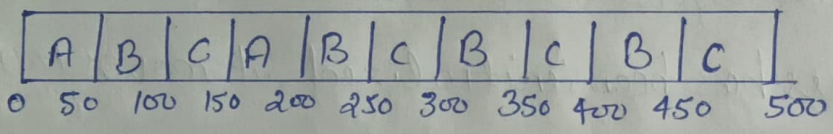
the process list.

ii) Determine which network ~~set~~ resource the process is waiting for. This can be done by analyzing the process's code or by checking the system logs.

iii) Check if the network resource is available. If the resource is not available, you may need to troubleshoot the network or contact the network administration.

Solution-7

| Process | Burst time ($t_c$) | I/O time ($t_{io}$) | Arival time |
|---|---|---|---|
| A | 100 | 500 | 0 |
| B | 350 | 500 | 5 |
| C | 200 | 500 | 10 |




Completion time of C → 500 + I/O time of C
→ 500 + 500
→ 1000 ms.

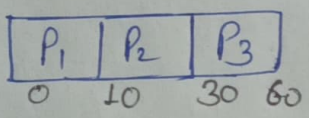
Solution-10:- To put it simply, an operating system is like the brain of computer. It is a software that manages all the hardware and software components of a computer and allows them to work together seamlessly. Without an operating system, a computer would be like a body with out a brain - it would not be able to function properly.

One of the main purposes of an operating is to provide a user-friendly interface ~~or~~ for users to intract with the computer.

Solution:-4 2 context switches are required.

| Process | Arrival time | Burst time |
|---|---|---|
| $P_1$ | 0 | 10 |
| $P_2$ | 2 | 20 |
| $P_3$ | 6 | 30 |

Gantt chart




Since context switches at time zero and at the end (60) is not include, therefore two (2) context switches are required. one at time 10 for $P_1$ to $P_2$ and another at time 30 for $P_2$ to $P_3$.

Solution:3→ Q = 10 Ms.

Process X Execution:- X is given to CPU.

If process X completely its work within this time frame, It voluntarily fields the CPU and move to the terminate state.

Process Y Execution:→ • Process Y is given the CPU after process's time Quantum expires.

- when the Quantum time (10ms) expire for process Y, it is forcibly preempted by scheduler moved back to "Ready state".
- This scheduler safety the next process in line.