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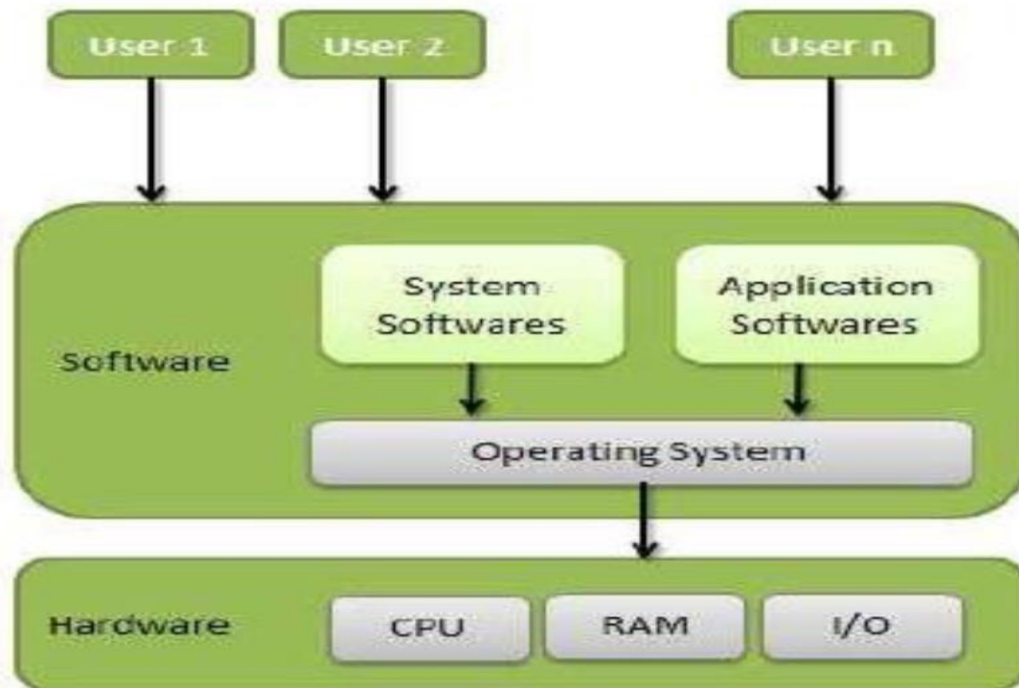
SUBJECT: operating system

INSTRUCTOR: Sir Daud Khan

1.Explain the main purpose of an operating system?

ANSWER:

An operating system is a program that acts as an interface between the user and the computer hardware and control the execution of all kinds of programs.



An operating system has three main functions:

- (1) manage the computer's resources, such as the central processing unit, memory, disk drives, and printers,
- (2) establish a user interface, and
- (3) execute and provide services for applications software.

2.What are the advantages of a multiprocessor system?

ANSWER:

The advantages of the multiprocessing system are:

- **Increased Throughput** – By increasing the number of processors, more work can be completed in a unit time.
- **Cost Saving** – Parallel system shares the memory, buses, peripherals etc. Multiprocessor system thus saves money as compared to multiple single systems.

3.Describe the objective of multiprogramming.

ANSWER:

objective of multiprogramming:

- In a computer system, there are multiple processes waiting to be executed, i.e. they are waiting when the CPU will be allocated to them and they begin their execution.
- These processes are initially kept in an area called job pool
- This job pool consists of all those processes awaiting allocation of main memory and CPU.
- The processor is shared amongst different processes.
- The main idea of multi programming is to maximize the CPU time.

- is the use of two or more CPUs (processors) within a single Computer system.
- The term also refers to the ability of a system to support more than one processor within a single computer system.
- Now since there are multiple processors available, multiple processes can be executed at a time

4. Give some benefits of multithreaded programming.

ANSWER:

benefits of multithreaded programming:

- Improved throughput. Many concurrent compute operations and I/O requests within a single process.
- Simultaneous and fully symmetric use of multiple processors for computation and I/O
- Superior application responsiveness. If a request can be launched on its own thread, applications do not freeze or show the "hourglass". An entire application will not block, or otherwise wait, pending the completion of another request.
- Improved server responsiveness. Large or complex requests or slow clients don't block other requests for service. The overall throughput of the server is much greater.
- Minimized system resource usage. Threads impose minimal impact on system resources. Threads require less overhead to create, maintain, and manage than a traditional process.
- Program structure simplification. Threads can be used to simplify the structure of complex applications, such as server-class and multimedia applications. Simple routines can be written for each activity, making

complex programs easier to design and code, and more adaptive to a wide variation in user demands.

- Better communication. Thread synchronization functions can be used to provide enhanced process-to-process communication. In addition, sharing large amounts of data through separate threads of execution within the same address space provides extremely high-bandwidth, low-latency communication between separate tasks within an application.

5.What is RR scheduling algorithm?

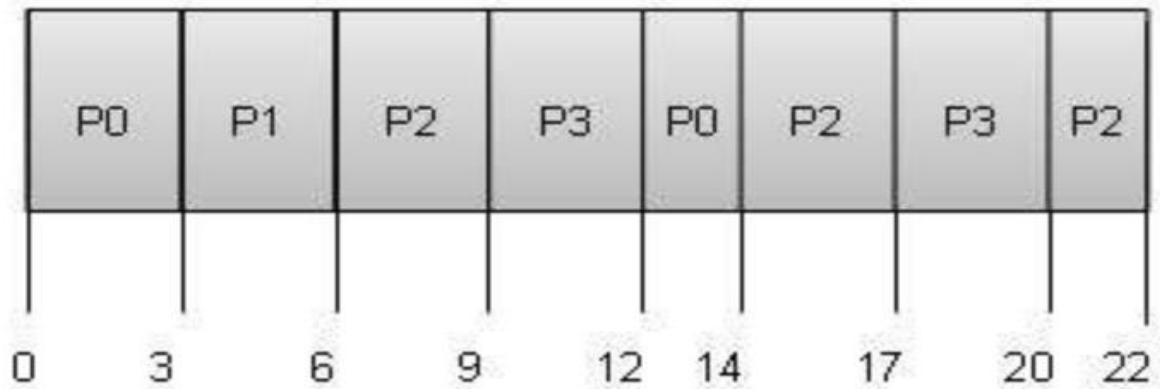
ANSWER:

Round Robin Scheduling:

- Round Robin is the preemptive process scheduling algorithm.
- Each process is provided a fix time to execute, it is called a **quantum**.
- Once a process is executed for a given time period, it is preempted and other process executes for a given time period.
- Context switching is used to save states of preempted processes

Process	Arrival Time	Execute Time
P0	0	5
P1	1	3
P2	2	8
P3	3	6

Quantum = 3



- Wait time of each process is as follows

Process	Wait Time : Service Time - Arrival Time
P0	$(0 - 0) + (12 - 3) = 9$
P1	$(3 - 1) = 2$
P2	$(6 - 2) + (14 - 9) + (20 - 17) = 12$
P3	$(9 - 3) + (17 - 12) = 11$

- Average Wait Time: $(9+2+12+11) / 4 = 8.5$

6.What are the primary differences between Network Operating System and Distributed Operating System?

ANSWER:

Network and Distributed Operating systems have a common hardware base, but the difference lies in software.

	Network Operating System	Distributed Operating System
1	A network operating system is made up of software and associated protocols that allow a set of computer network to be used together.	A distributed operating system is an ordinary centralized operating system but runs on multiple independent CPUs.
2	Environment users are aware of multiplicity of machines.	Environment users are not aware of multiplicity of machines.
3	Control over file placement is done manually by the user.	It can be done automatically by the system itself.
4	Performance is badly affected if certain part of the hardware starts malfunctioning	It is more reliable or fault tolerant i.e distributed operating system performs even if certain part of the hardware starts malfunctioning.

7.What inconveniences that a user can face while interacting with a computer system, which is without an operating system.

ANSWER:

Operating system is a required component of the computer system.

Without an operating system computer hardware is only an inactive electronic machine, which is inconvenient to user for execution of programs.

As the computer hardware or machine understands only the machine language. It is difficult to develop each and every program in machine language in order to execute it.

Thus without operating system execution of user program or to solve user problems is extremely difficult.