CS & IT ENGINEERING

Operating System

Process Management

Lecture -1

By- Vishvadeep Gothi sir

Topics to be Covered

- **Topic** Operating System Definition
- **Topic** Types of Operating System
- **Topic** Dual Mode of Operation

Topic : Introduction

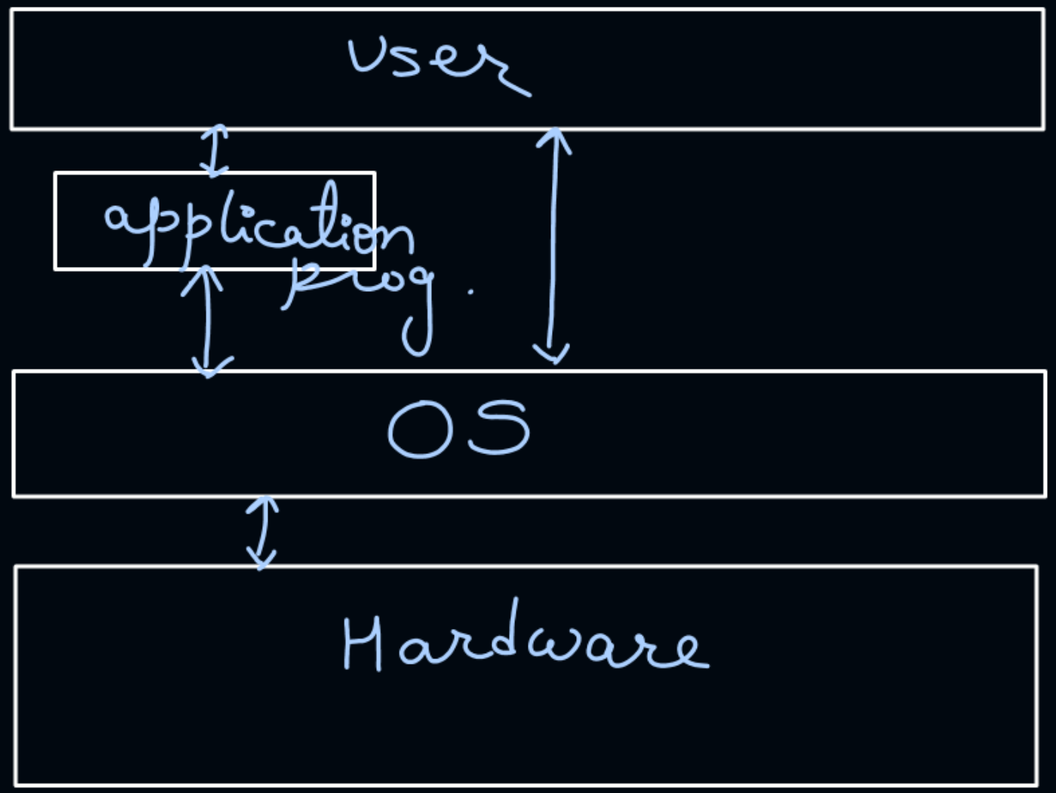
- **GATE Ranks:**
  - 682 (2009) – 3rd year
  - 19 (2010) – 4th year
  - 119, 440 etc.

- **Education:**
  - ME from IISc Bangalore
  - M. tech from BITS-pilani in Data Science

- **Work:**
  - 17+ Year Teaching Experience
  - 13+ in GATE/IES (Gate Forum, Gate Academy, ACE)
  - Worked in Cisco, Audience Communication

Topic : Operating System

- Software abstracting hardware
- Interface between user and hardware
- Set of utilities to simplify application development/execution
- Control program
- Acts like a government


User
application prog.
OS
Hardware

Topic : OS Course Syllabus

Chapter Number	Chapter Name
1	Introduction
2	Process Management
3	CPU Scheduling
4	Process Synchronization
5	Deadlock
6	Memory Management & Virtual Memory
7	File System
8	Disk Scheduling

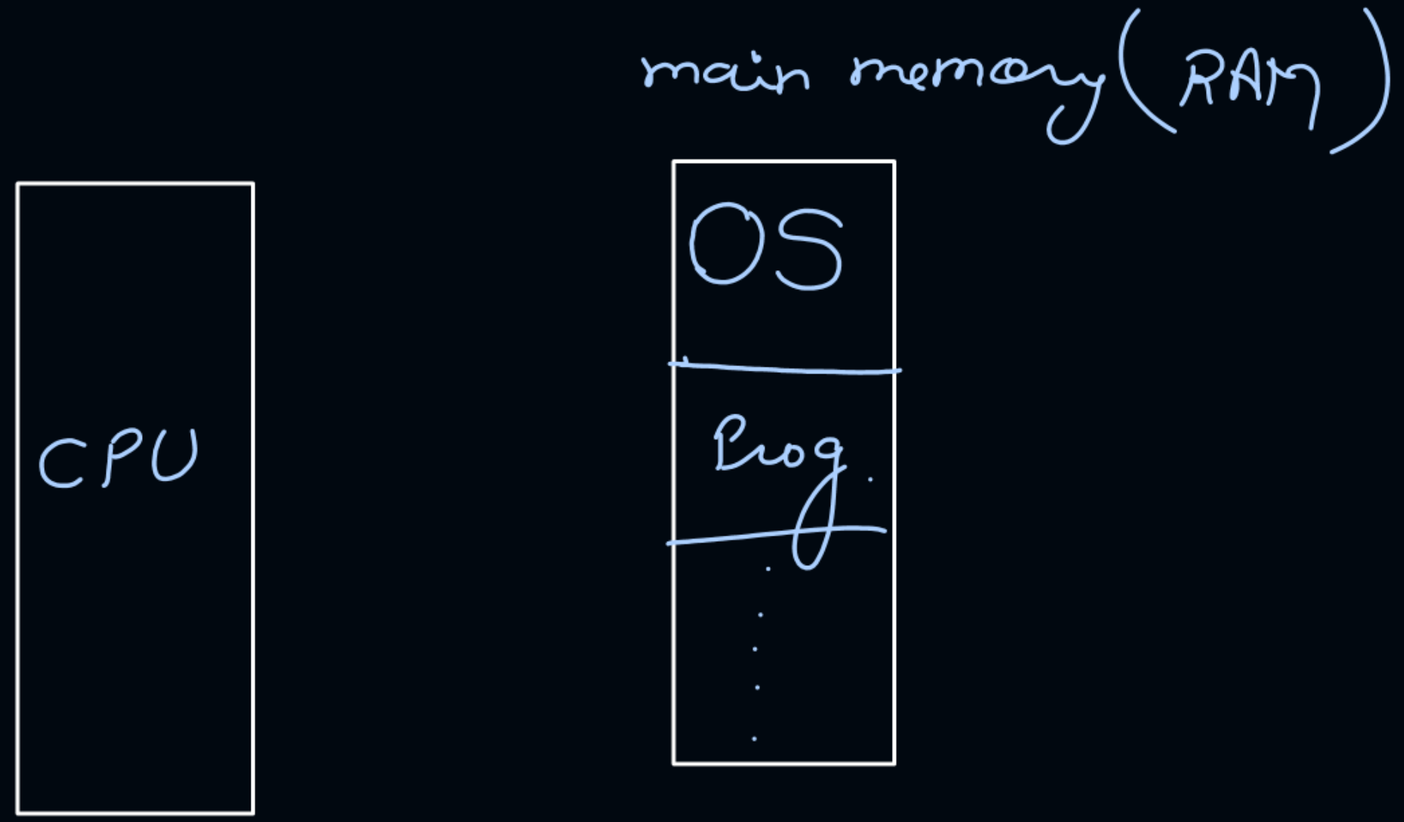
Process
CPU scheduling

Prerequisite :-

Basics of number system ⇒ Binary, hexadecimal

Basics of Computer system

Comp.



Topic : Services of OS

- User Interface
- Program Execution → Important feature of OS
- I/O Operation
- File-System Manipulation
- Communication (Inter-process Communication)
- Error Detection
- Resource Allocation
- Accounting
- Protection & Security

Topic : Goals of OS

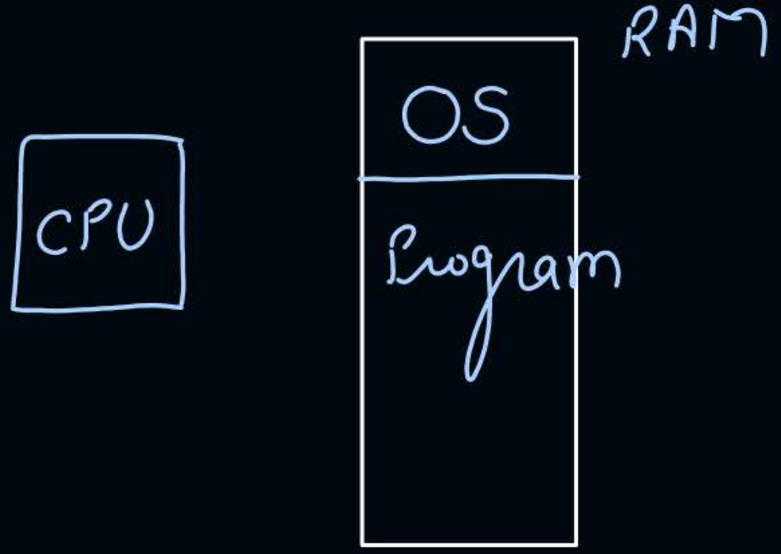
- Convenience (User-friendly)
- Efficiency
- Portability
- Reliability
- Scalability
- Robustness

Topic : Types of OS

1. Uniprogramming OS
2. Multiprogramming OS
3. Multitasking OS (Time Sharing)
4. Multiprocessing OS
5. Multiuser OS
6. Real Time OS
7. Embedded OS
8. Handheld Device OS

Uniprogramming OS :-

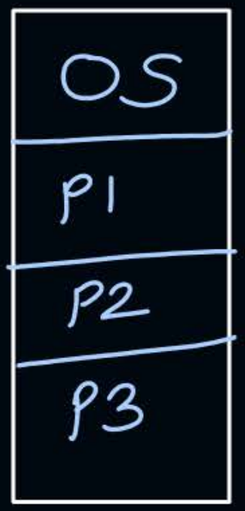
An OS which allows only one process in main memory at a time.



when the process goes for I/O operation then CPU will be idle. Hence uniprogramming OS does not utilize CPU properly.

Multiprogramming OS :-

An OS which allows multiple programs to be in main memory.



Now when a process goes for I/O operation, then OS can schedule other process to run on CPU; hence better CPU utilization.

No. of processes in main memory at a time is called as "degree of multiprogramming"

when degree of multiprogramming increases, then CPU utilization also increases; but upto a limit.

Types of multiprogramming OS

Non-preemptive

If a process runs on CPU, then it leaves CPU only when it wants.
OS forcefully can not take out the process from CPU.

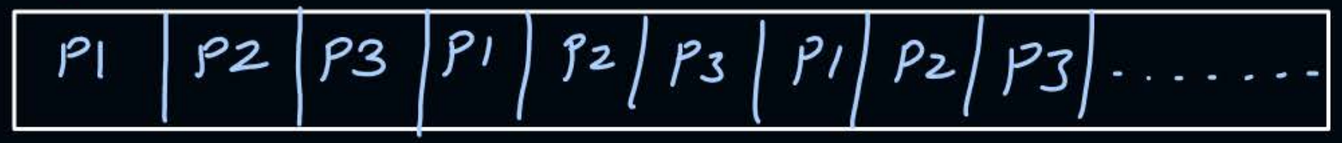
Preemptive

If a running process can be taken out of the CPU forcefully.

Multitasking OS :-

Extension of preemptive multiprogramming OS in which processes are executed in round-robin manner.

CPU

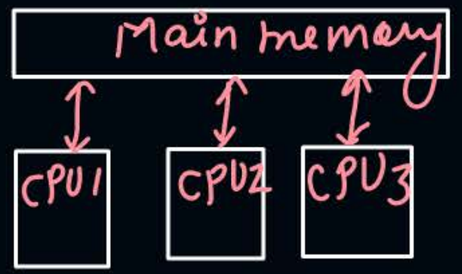


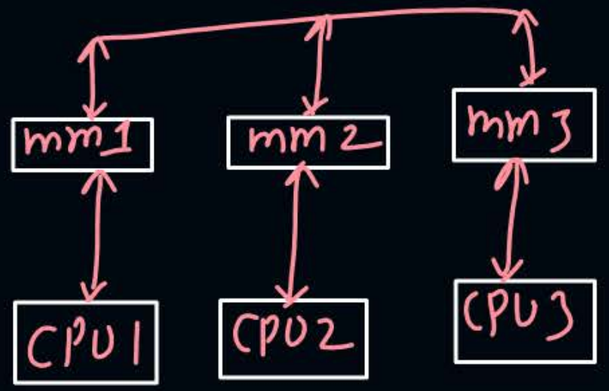
Multiprocessing OS:-

Used on computers with multiple CPUs

Types

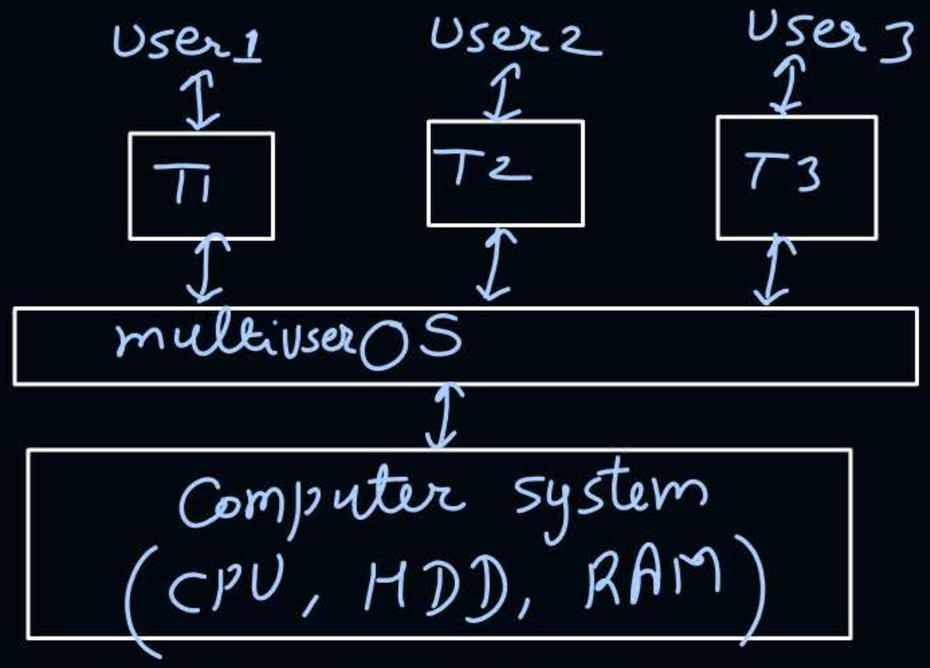
- Tightly Coupled (Shared-memory)
- Loosely coupled (Distributed system)





Multiuser OS:-

It is used on Computer system which can be used by multiple users simultaneously.

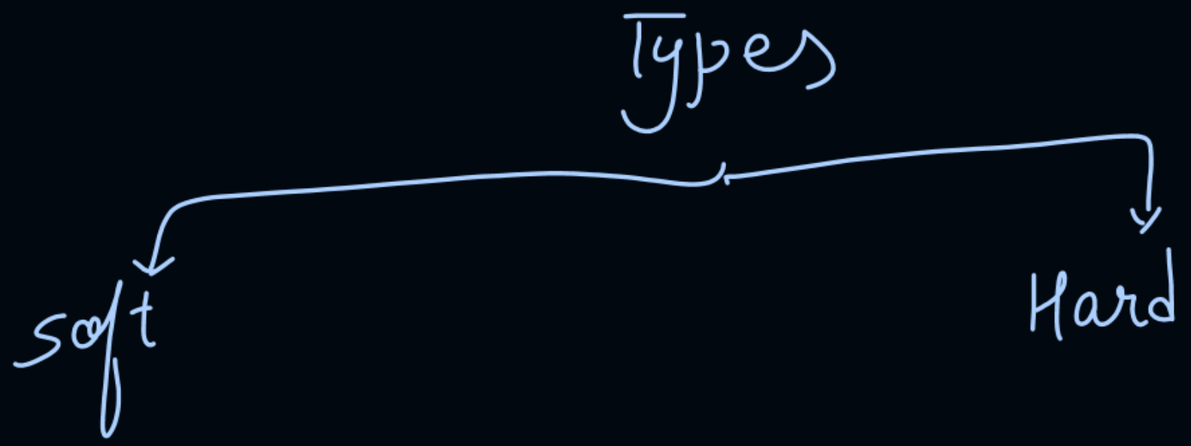


T1, T2, T3 ⇒ Terminals
(screen, keyboard, mouse, other I/O)

Realtime OS :-

works on real time data & event.

⇒ Each process has a deadline.



Embedded OS :-

OS used on embedded systems which are attatched with other devices like cars, A.C., washing machines.

Hand-Held OS:-

OS used on hand-held devices like mobile phones etc.

2 mins Summary

Topic Operating System Definition

Topic Types of Operating System

Topic Dual Mode of Operation

Happy Learning

THANK - YOU