CS & IT ENGINEERING

Operating System

Basics of OS

(One Shot)

Topics to be Covered

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


COA
OS

Topic : Introduction

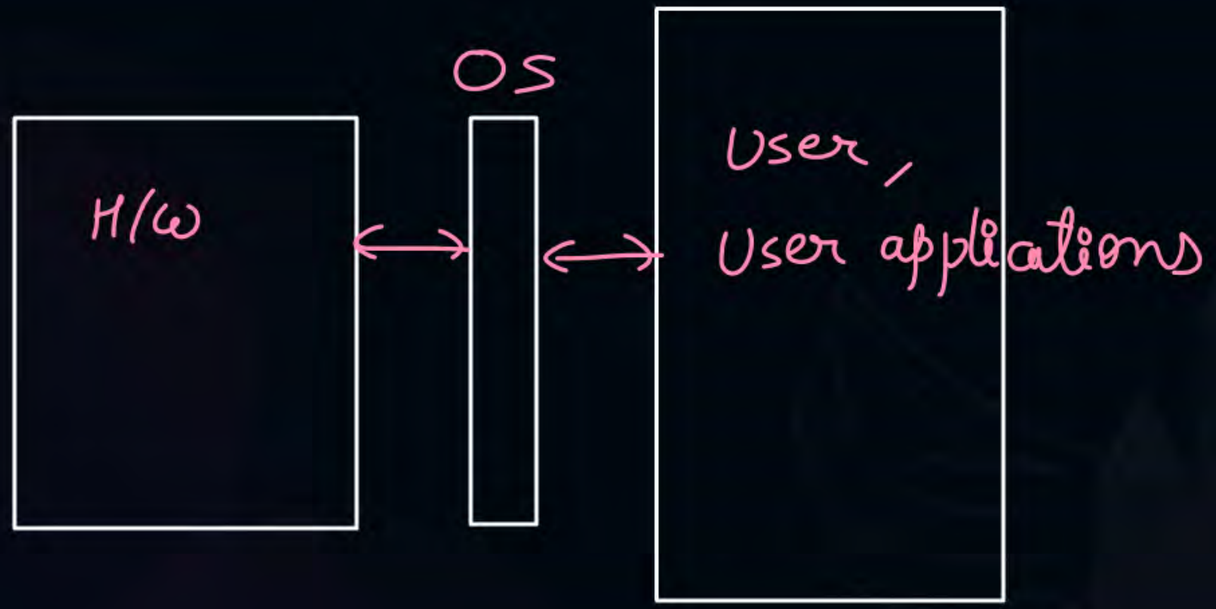
- **GATE Ranks:**
  - 682 (2009) – 3rd year
  - 19 (2010) – 4th year
  - 119, 440 etc.

- **Education:**
  - ME from IISc Bangalore
  - M. tech from BITS-pilani in Data Science (2018 – 2020)

- **Work:**
  - 19+ Year Teaching Experience
  - 15+ years in GATE/IES
  - Worked in Cisco, Audience Communication

Topic : Operating System

- Interface between user and hardware



Topic : Operating System

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

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

Topic : Services of OS

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

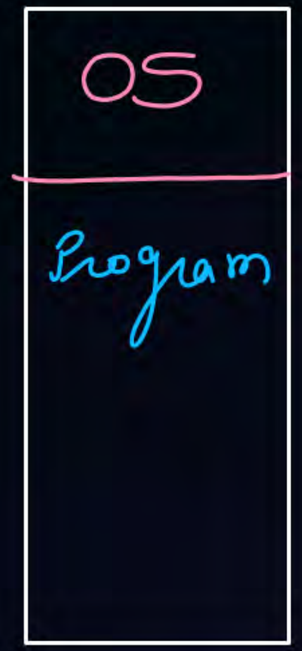
Topic : Types of OS

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

Topic : Uniprogramming OS

not proper utilization of CPU.

main memory



Topic : Multiprogramming OS

This OS allows more than one programs in main mem. at at time.

mem.

Better CPU utilization.

Degree of multiprogramming :-

no. of processes in main memory at a time.

as degree of multiprogramming increases, CPU utilization also increase till certain level.

multiprogramming OS

Non-preemptive

Running process leaves CPU only when it wants to.
(either completed or goes for I/O)

Preemptive

A running process can be taken out of CPU forcefully.

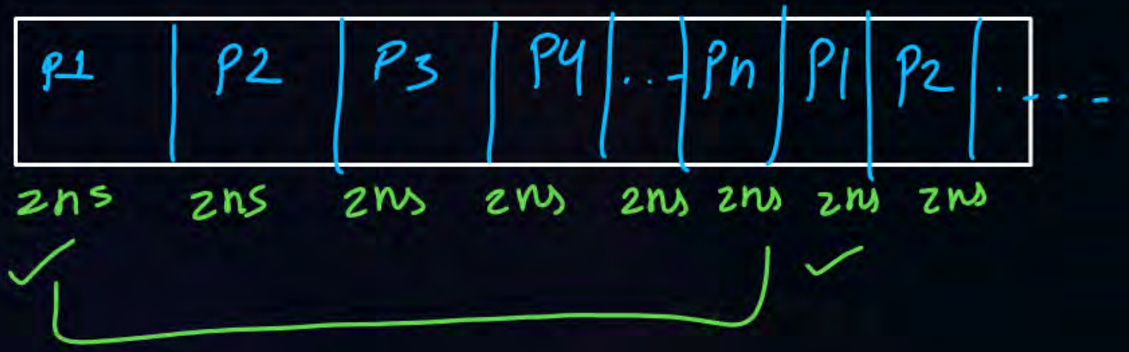
Topic : Multitasking OS

(Time sharing)

It is extension of preemptive multiprogramming OS.

Processes run in round robin manner.

round robin



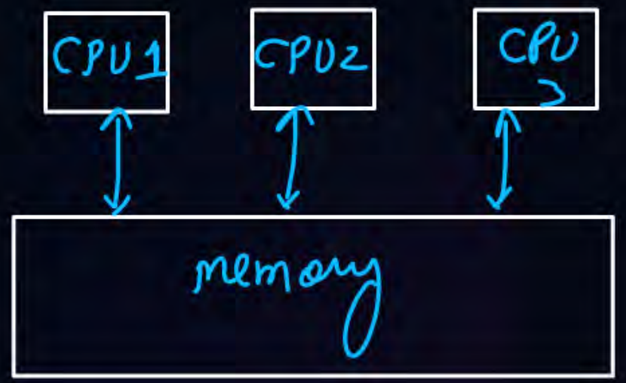
Topic : Multiprocessing OS

↓

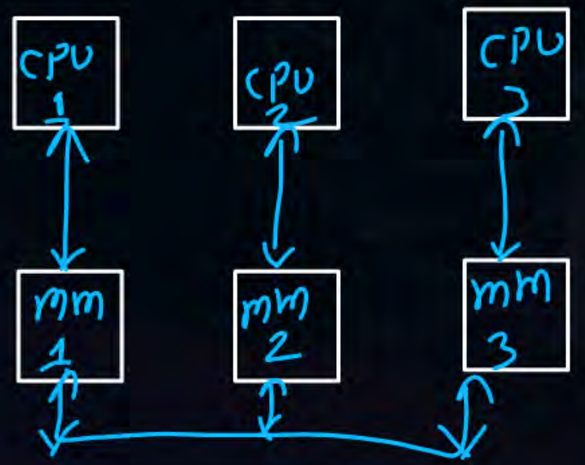
it works on computer with multiple CPU.

Type

shared memory
or
Tightly coupled



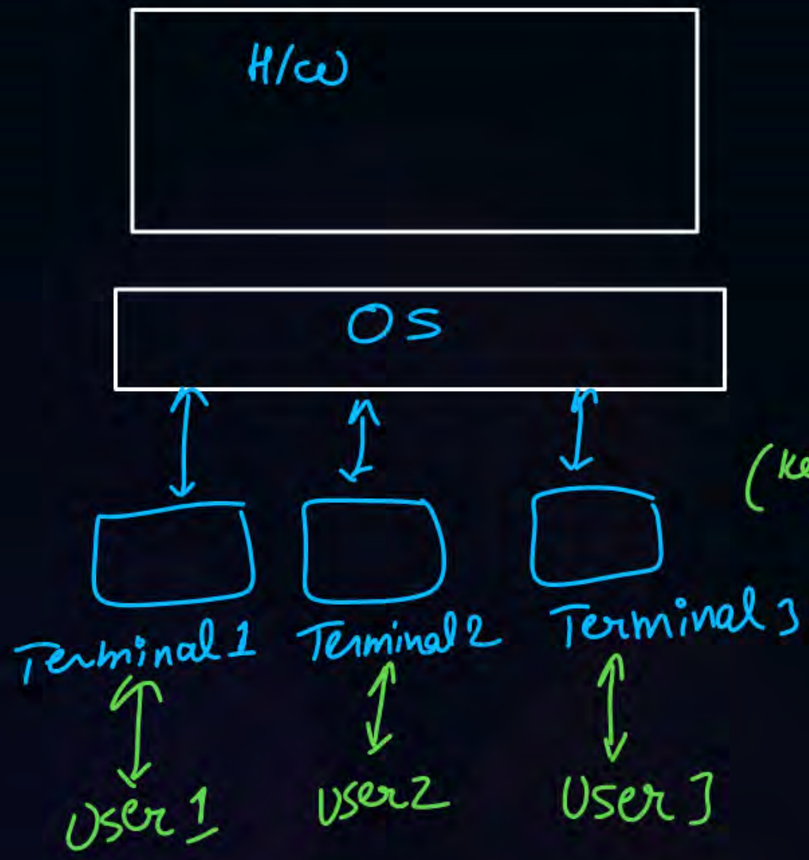
Distributed
or
Loosely coupled



Topic : Multiuser OS

M.S. & Apple ⇒ not multiuser

Linux & Unix ⇒ multiuser



(keyboard, mouse, screen, USB ports)

Topic : Real Time OS

it works on real time data or event.

⇒ Every process has a deadline.

Topic : Embedded OS

OS which works on machine (car, AC etc.)

microprocessor

CPU or processor chip

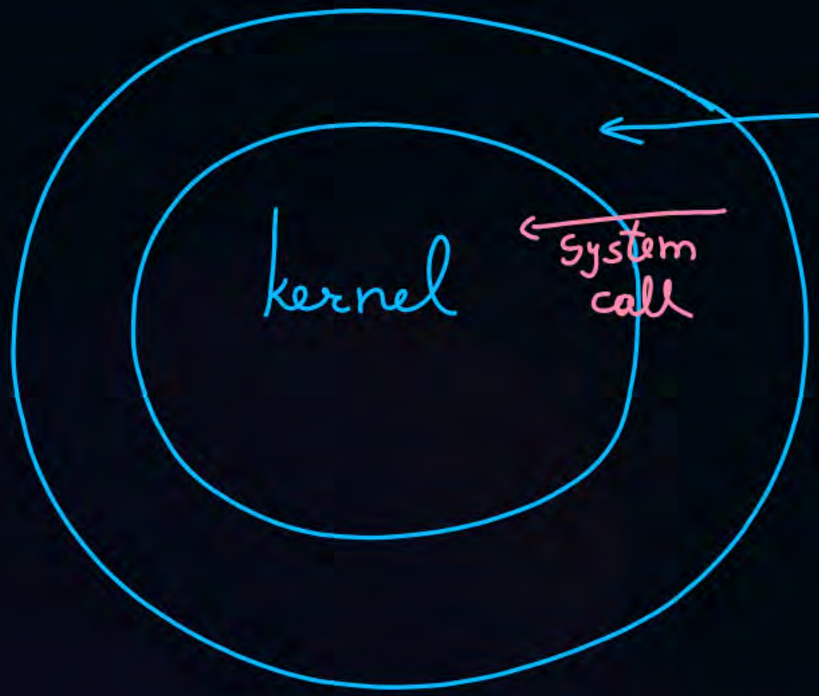
microcontroller

CPU, mem, OS, other sensor on single chip

Topic : Handheld Device OS

Used on devices which can be held in hands.

Topic : Parts of OS



shell ⇒ Graphical user Interface

↳ Command Line Interpreter

Topic : System Call

A system call is a way for programs to interact with the operating system

flag Reg. in CPU

Topic : Dual Mode of Operation

2 Modes:

1. User Mode (mode bit = 1)
2. Kernel/System/Supervisor/Privileged Mode (mode bit = 0)

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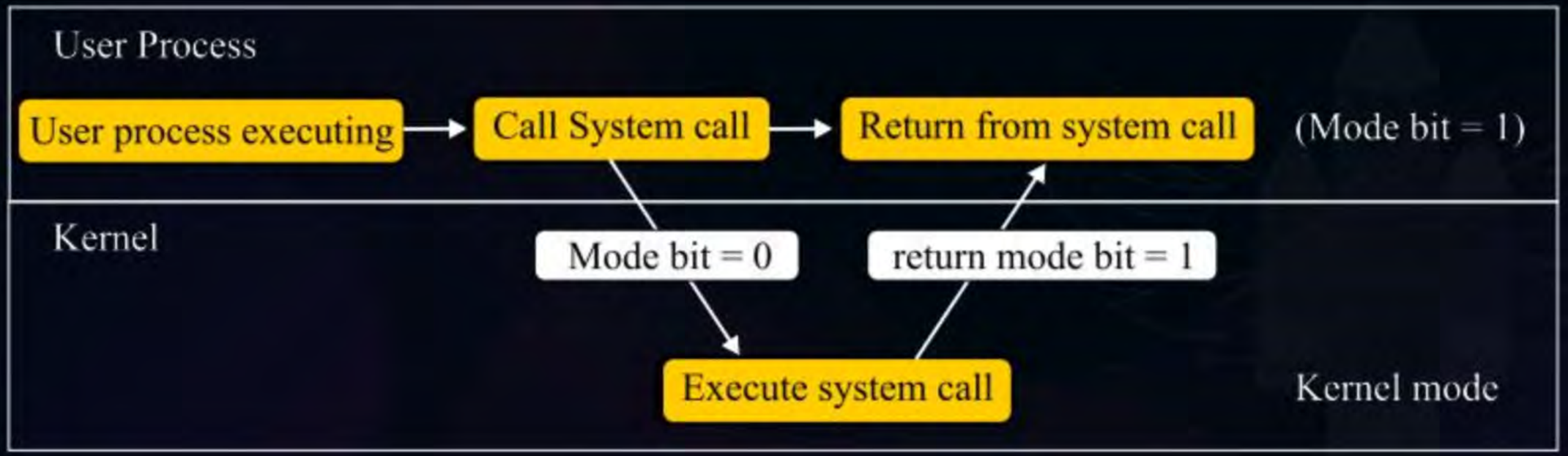

2 mins Summary

Topic Operating System Definition

Topic Types of Operating System

Topic Dual Mode of Operation

Happy Learning

THANK - YOU