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Introduction

Comprehensive Course on Operating System for GATE - 2024/25

Vishvadeep Gothi • Lesson 1 • Apr 14, 2023

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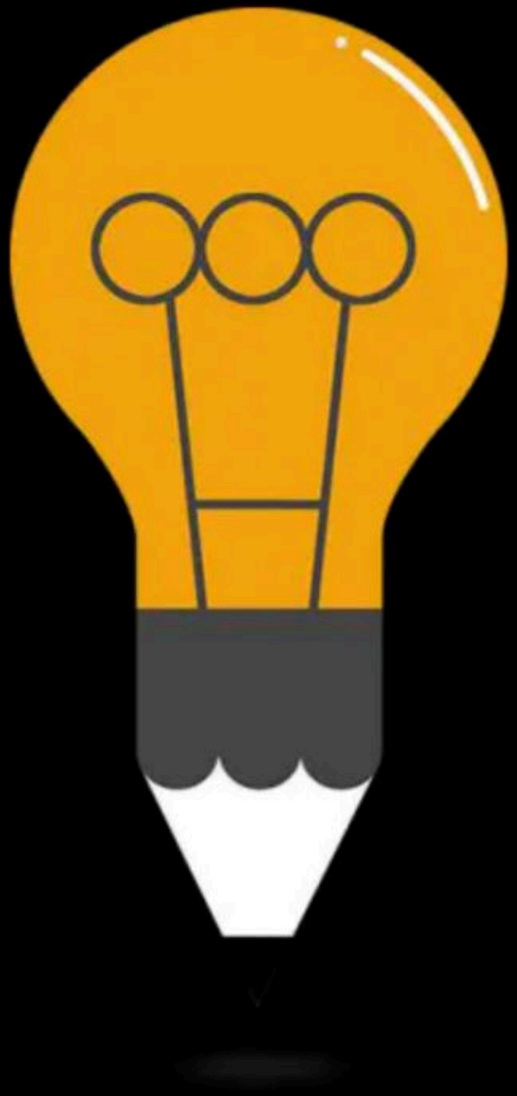

Operating System Basics

By: Vishvadeep Gothi

Motivation

There is no motivation which makes you consistent,
Your boring routine makes you consistent..

Vishvadeep Gothi

- **GATE Ranks:**
  - 682 (2009) – 3rd year
  - 19 (2010) – 4th year
  - 119, 440 etc.
- **Education:**
  - ME from IISc Bangalore
  - Mtech from BITS-pilani in Data Science
- **Work:**
  - 15+ Year Teaching Experience
  - 12+ in GATE/IES (GateForum, Gate Academy, ACE)
  - Worked in Cisco, Audience Communication
- **Professions:**
  - Freelance S/W developer
  - Educator
  - CrossFit Trainer

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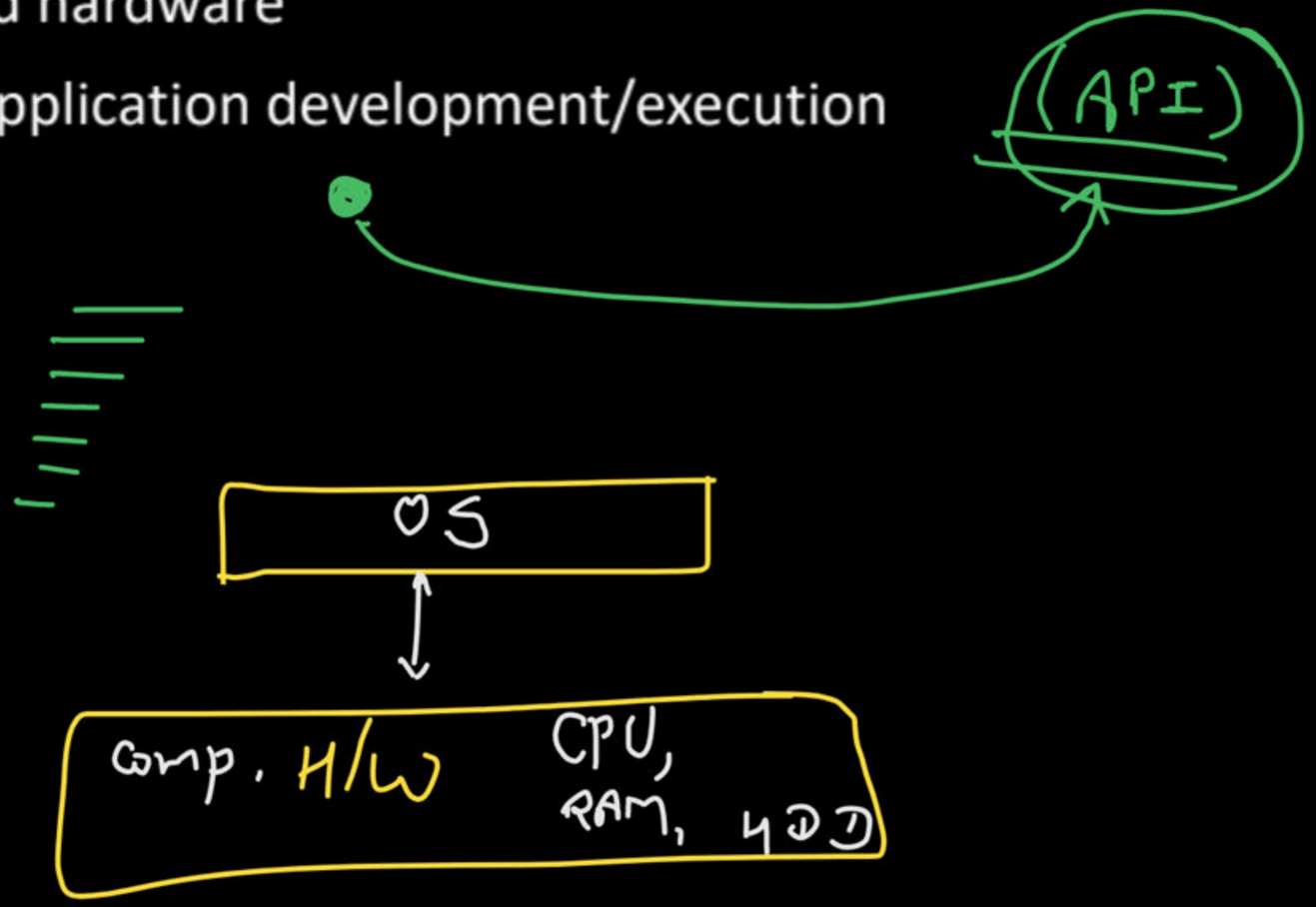
OS

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



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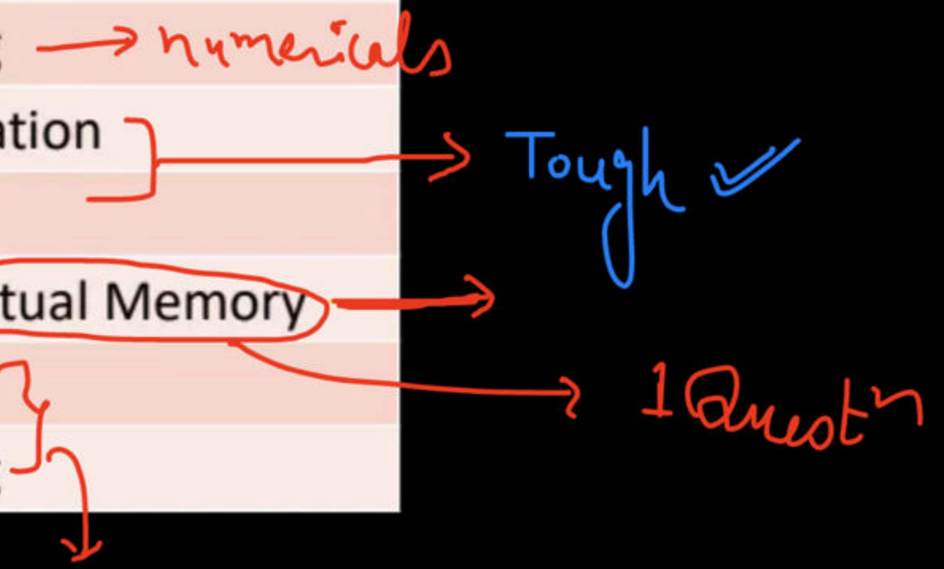
OS

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

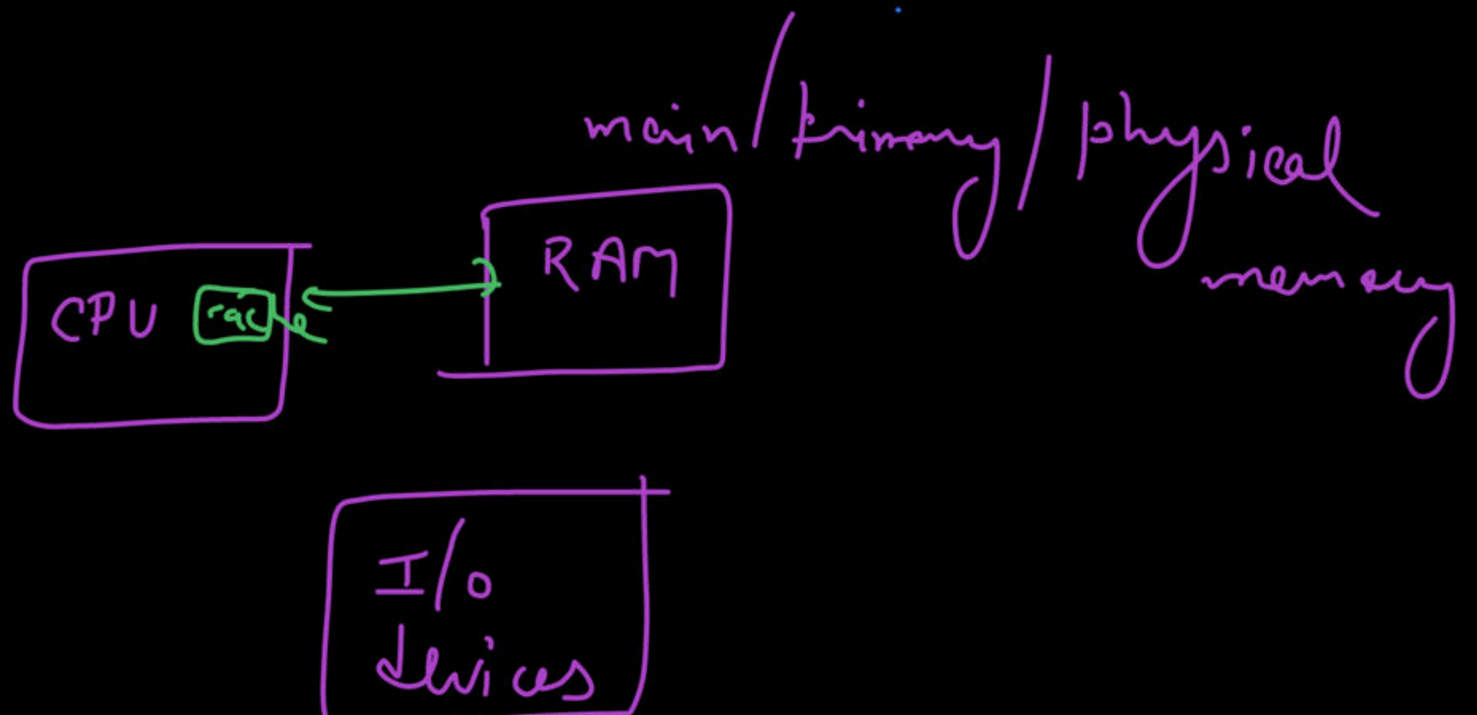


Services of OS

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

most imp. part

HDD → files
→ folder



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Goals of OS

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

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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

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Uniprogramming OS

This OS allows only 1 program to be in RAM at a time.

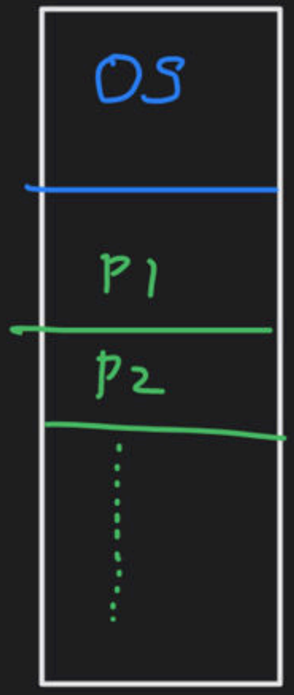
RAM

Single prog. cannot keep CPU & I/O busy simultaneously.

Not very efficient CPU utilization.

Multiprogramming OS

This OS allows multiple processes in RAM.



Better CPU utilizat° as compared to uniprogramming OS; because if a process goes for I/o then other process will be ready to run on CPU.

Degree of multiprogramming:-

no. of process in m.m.

As degree of multiprogramming increases, CPU utilizⁿ also increases.
But upto a certain limit.

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multiprogramming OS

Non-preemptive

A process can leave CPU only with its own wish.

→ Either process completed

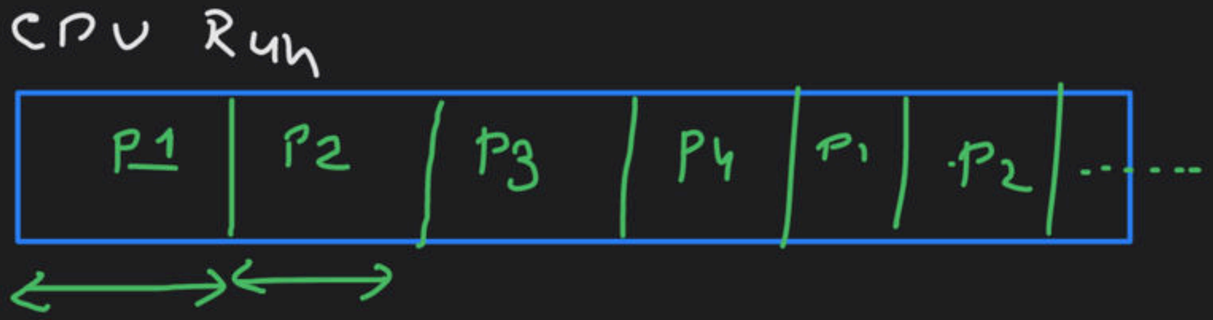
→ or process wants to use I/O

Preemptive

A running process can be taken out of CPU forcefully.

multi-tasking OS (Timesharing OS)

It is an extension of preemptive multiprogramming OS, in which processes are executed in round-robin manner.



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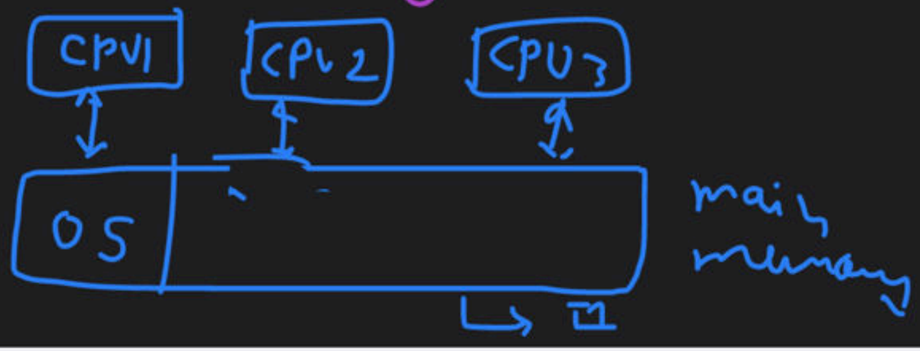
Multiprocessing OS

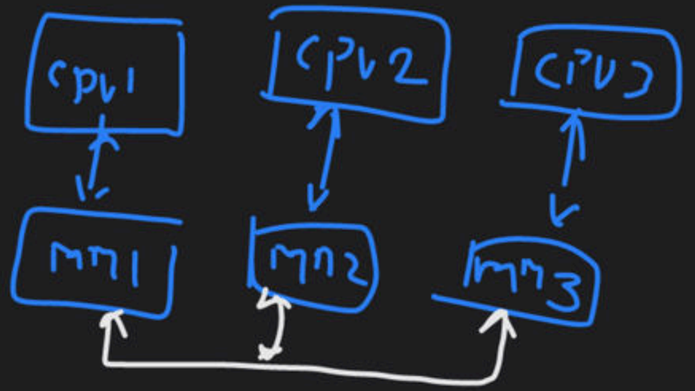
is used on computers having multiple CPU's.

Type

Tightly coupled
or
shared memory



Loosely coupled
or
Distributed system



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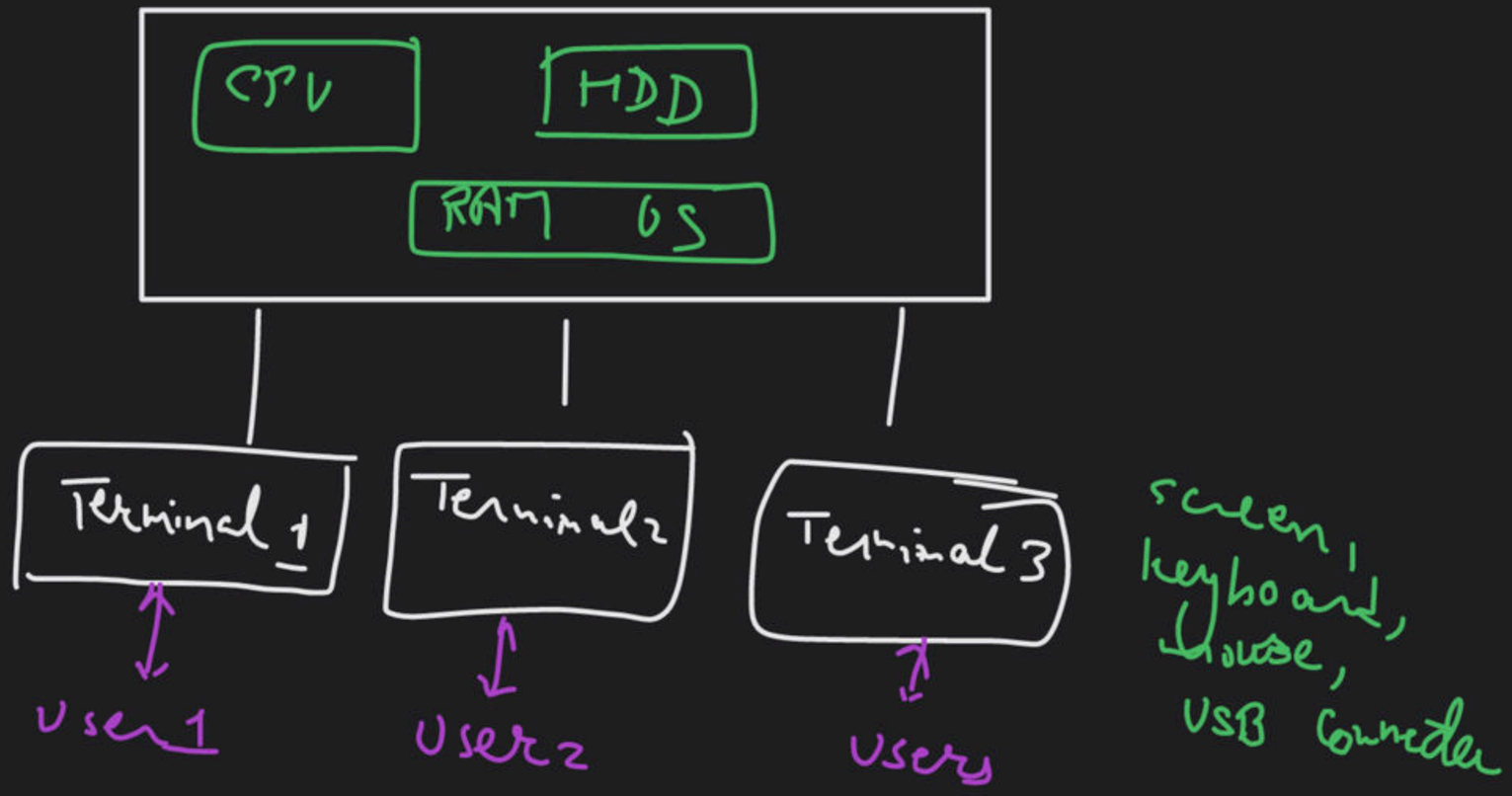
multi user OS

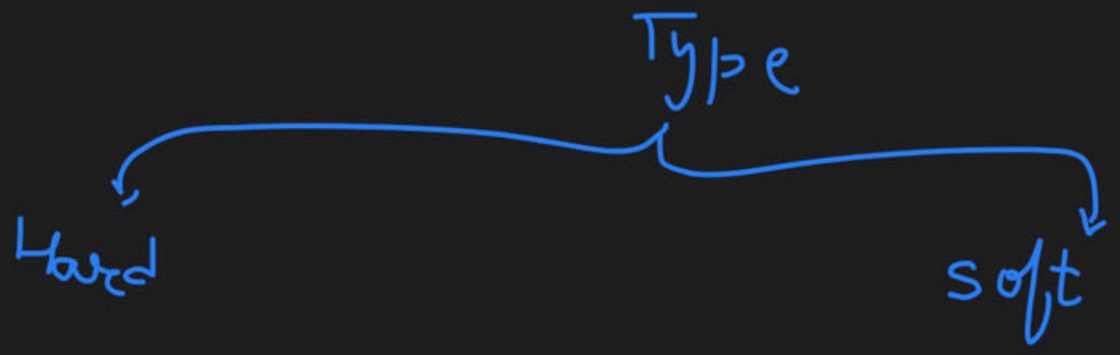
This OS allows multiple users to use one computer system simultaneously.



Real time OS

This OS runs on computer which runs on real time event or data.

⇒ Every process gets a deadline, and each process should complete within deadline.



Embedded OS

used on embedded system.

Hand-Held OS

OS used on devices like phones, tablets etc..

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System Call

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

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Parts of OS

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Dual Mode of Operation

2 modes:

User Mode (mode bit = 1)

Kernel/System/Supervisor/Privileged Mode (mode bit = 0)

Dual Mode of Operation

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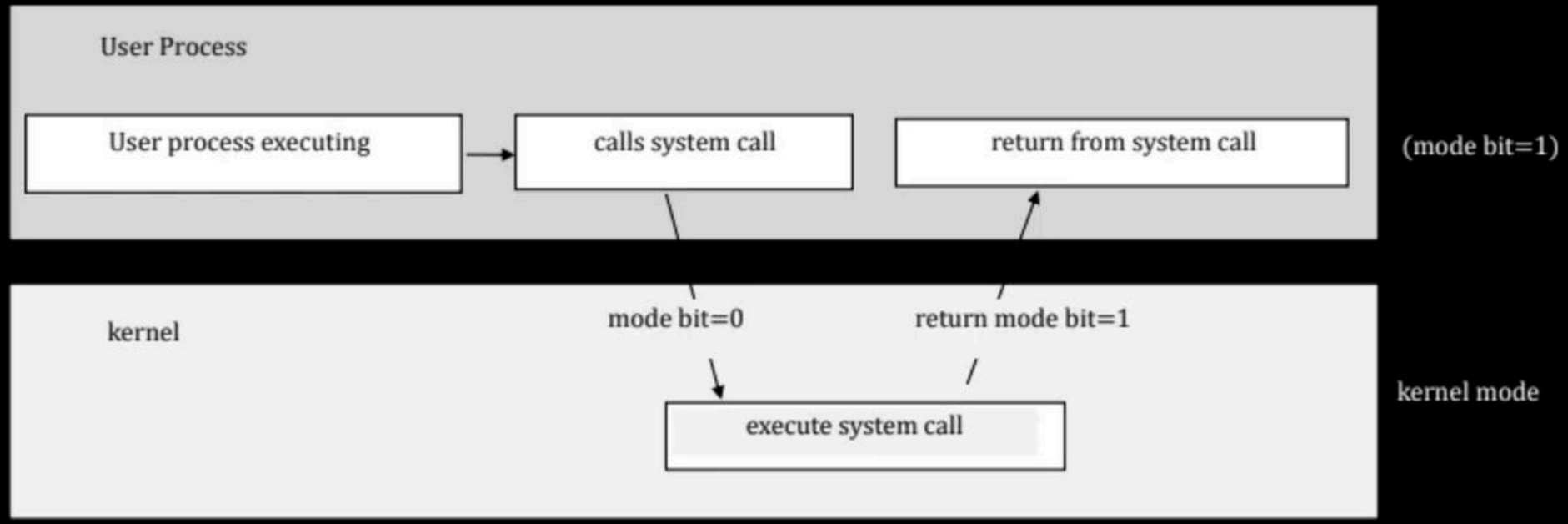

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Happy Learning.!

VD spartan

@vdeep10