

# Operating System: Types of OS



For Questions & Queries:  
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By: **Vishvadeep Gothi**

# VISHVADEEP GOTHI SIR

AIR 19  
in GATE 2010



**ME from IISc Bangalore  
MTech BITS Pilani (Data Sc.)**



**13+ Years of Teaching Experience,  
9+ Years in GATE/IES**



**Subjects Taken:**  
Computer Organization,  
Data Structure, OS, C-lang,  
Coding Interview Problems





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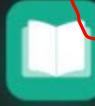
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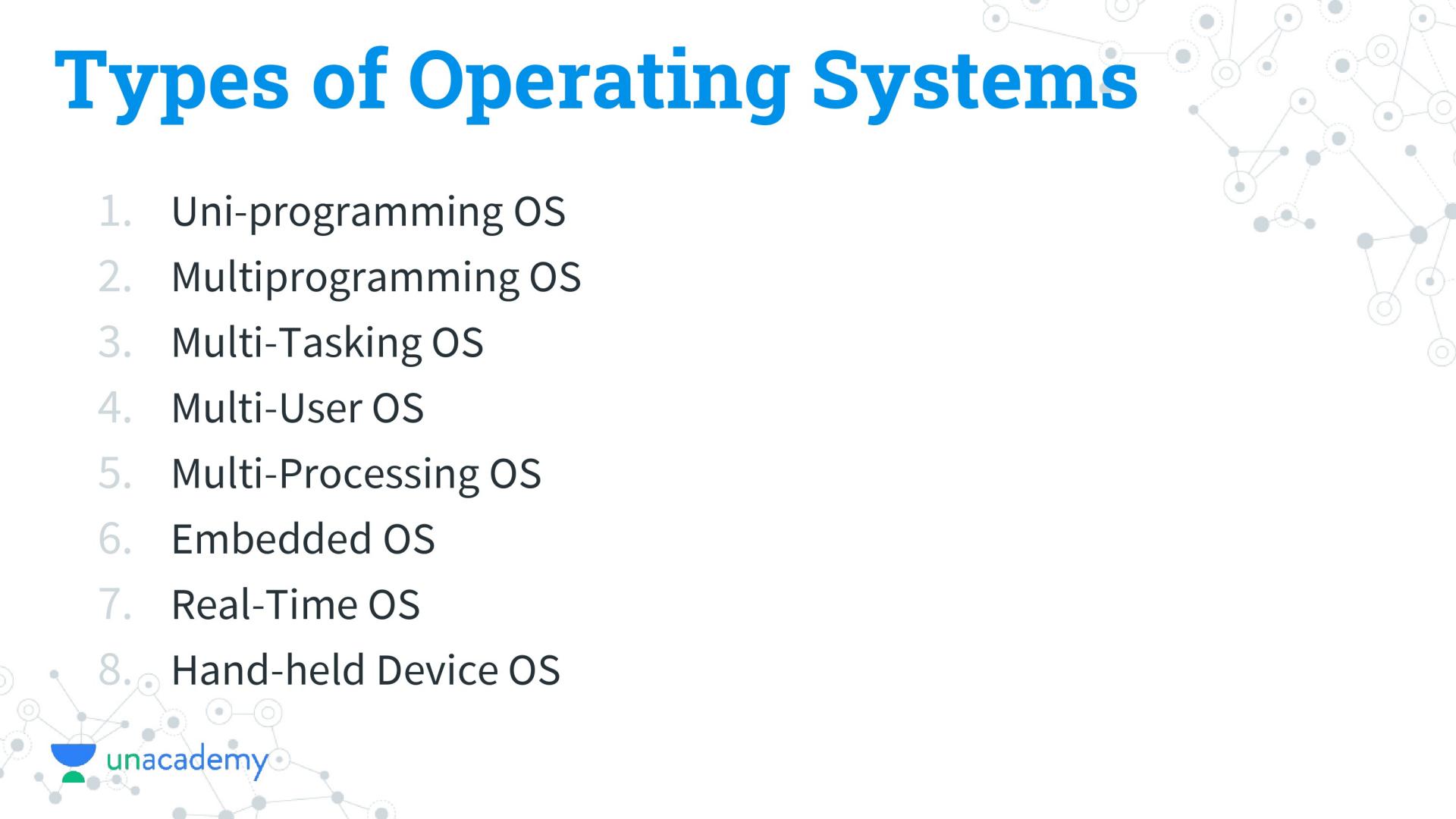
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# Operating System



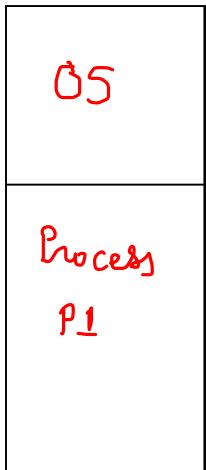
# Types of Operating Systems

1. Uni-programming OS
2. Multiprogramming OS
3. Multi-Tasking OS
4. Multi-User OS
5. Multi-Processing OS
6. Embedded OS
7. Real-Time OS
8. Hand-held Device OS



# Uni-programming OS

OS allows only one process to reside in main memory



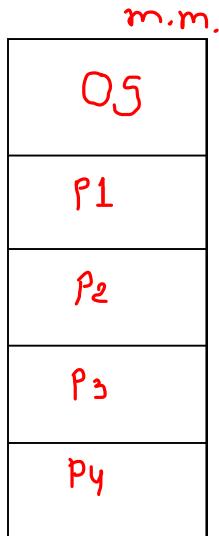
Single process cannot keep CPU & I/o devices  
busy simultaneously.

→ Not a good CPU utilization.



# Multi-programming OS

OS allows multiple processes to reside in main memory



→ Better CPU utilization than uni-programming

→ Degree of multiprogramming :-

No. of running programs (processes) in mm.

→ As the degree of multiprogg increases, CPU utilization also increases. but upto a certain limit. the limit will be understood better in thrashing concept

# Multi-programming OS: Types

Preemptive

A process can be forcefully taken out of CPU.

Non-Preemptive

A process runs off CPU till its wish.

- Either process terminates
- or goes for I/O operation.

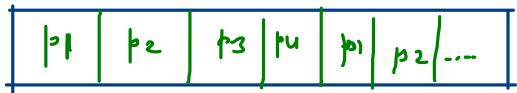
pura ka pura process ek bari me execute hoga (including I/O)

# Multi-tasking OS

Time-sharing OS

Extension of multi-programming OS in which processes execute in round-robin fashion.

Round-robin



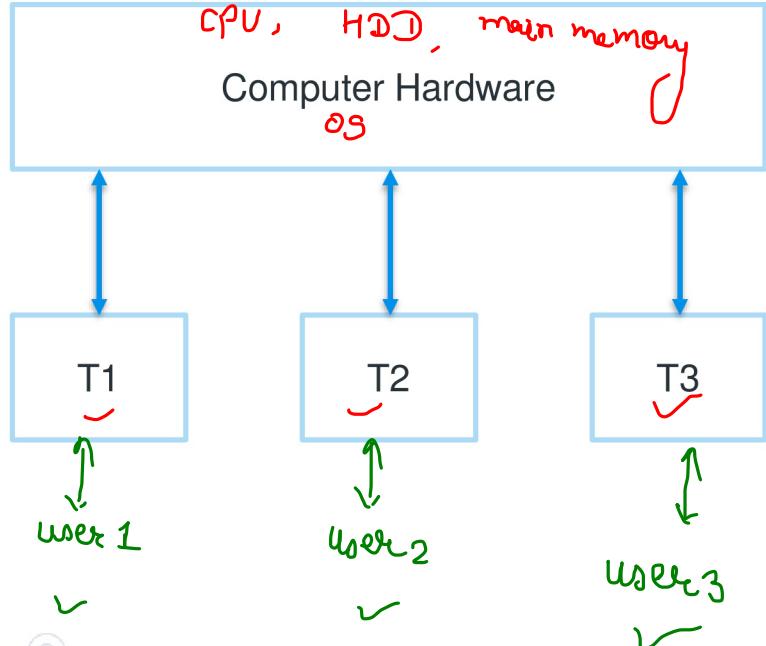
# Multi-User OS

This OS allows multiple users to access single system simultaneously

windows — not multiuser OS

Unix  
&  
Linux } Yes multiuser

# Multi-User OS



T1 :- keyboard, mouse, display  
etc.



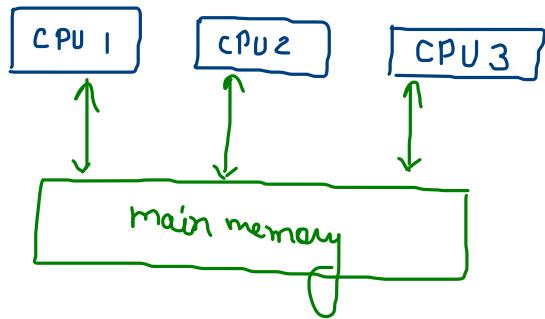
# Multi-Processing OS

This OS is used in computer systems with multiple CPUs



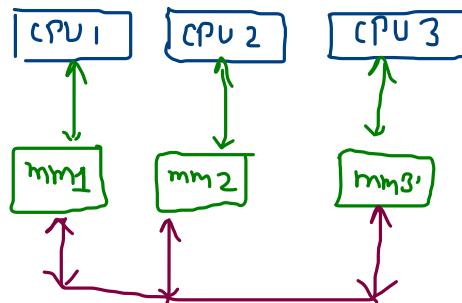
# Multi-Processing OS: Types

Tightly Coupled  
(shared-memory)



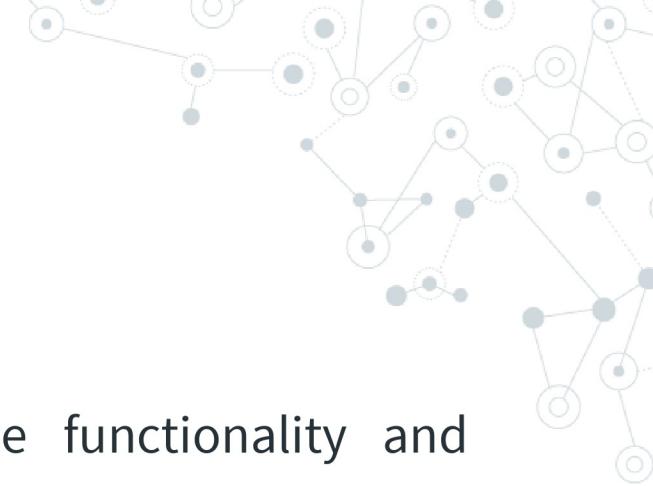
less freedom

Loosely Coupled  
(Distributed system)



more independency and freedom

# Embedded OS



An OS for embedded computer systems.

- ◎ Designed for a specific purpose, to increase functionality and reliability for achieving a specific task.

→ User interaction with OS in min.

Example : OS for Air Conditioner



# Real-Time OS

Real time operating systems (RTOS) are used in environments where a large number of events, mostly external to the computer system, must be accepted and processed in a short time or within certain deadlines.

OS used for rocket launching

→ Every process has a deadline.

Types

Hard RTOS

strict  
about  
deadlines

soft RTOS

Some relaxatn  
in deadline

# Hand-held Device OS

OS used in hand-held devices.



# Next Class

What is Process?

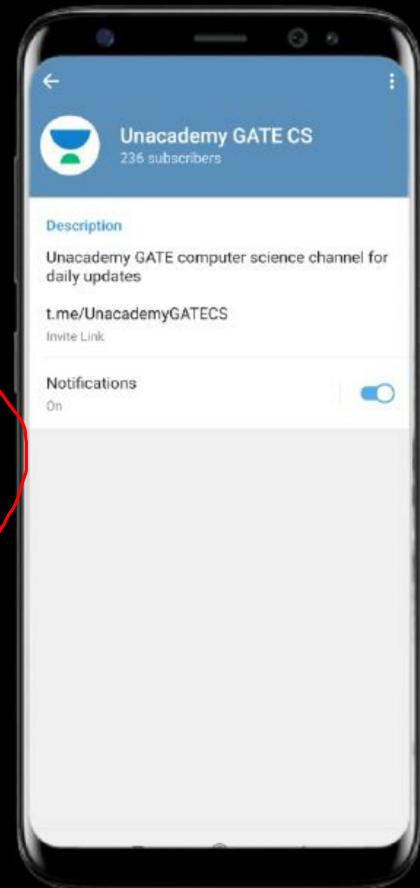


Process Management





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