



# CS & IT ENGINEERING

## Operating Systems

Introduction & Background

**Lecture No. 2**



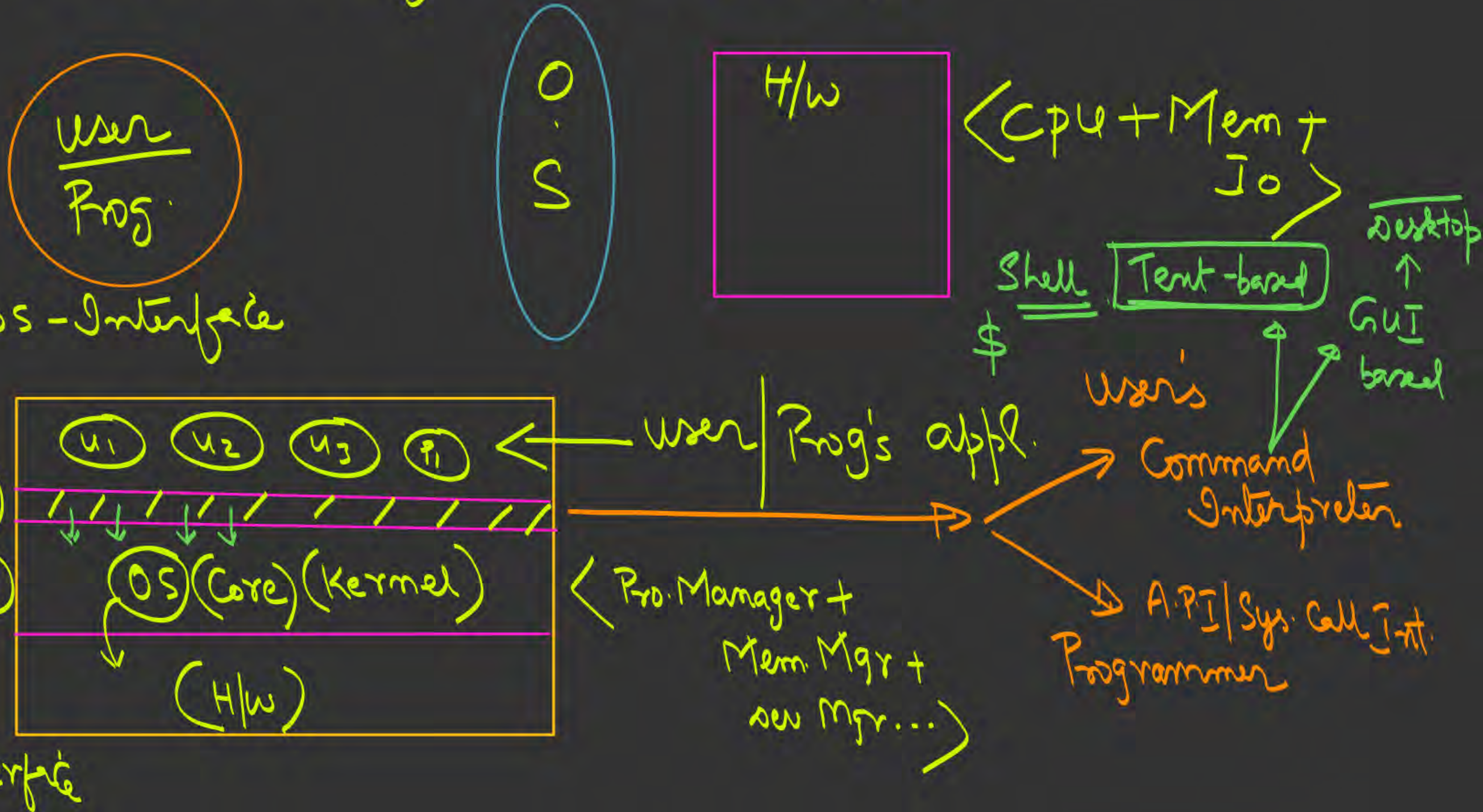
**By- Dr. Khaleel Khan sir**





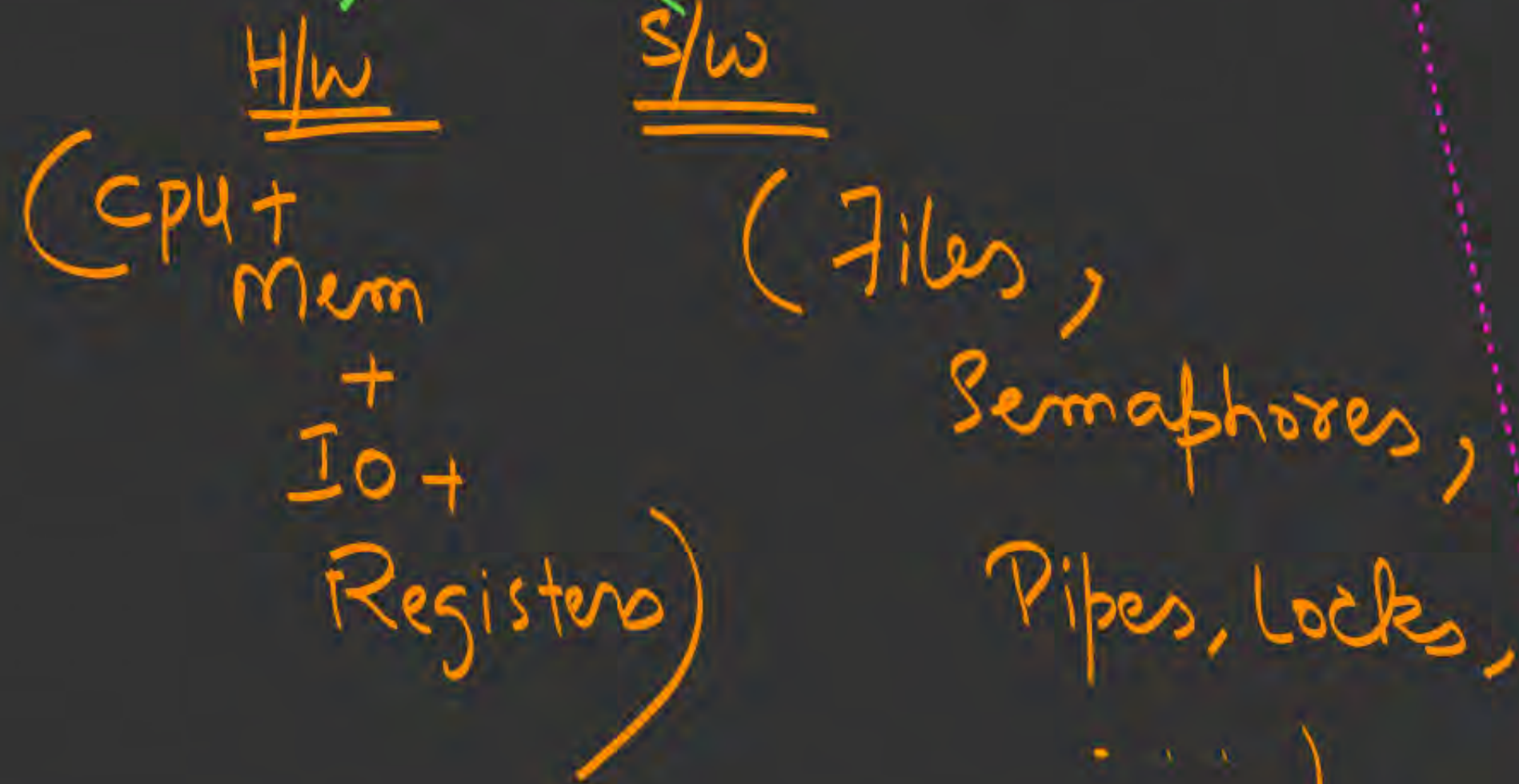


→ O.S is an interface b/w user & H/w





→ OS is a Resource Manager

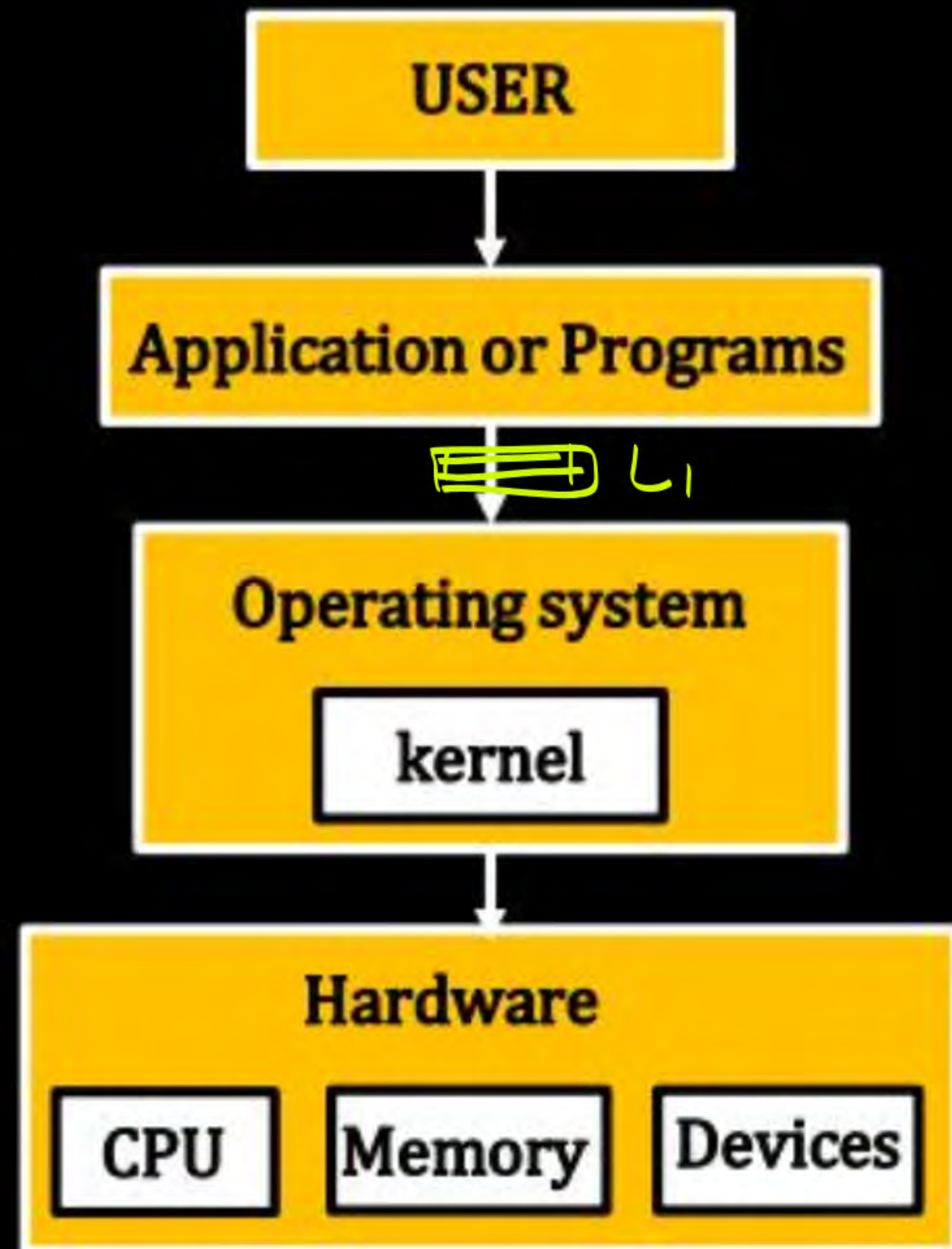
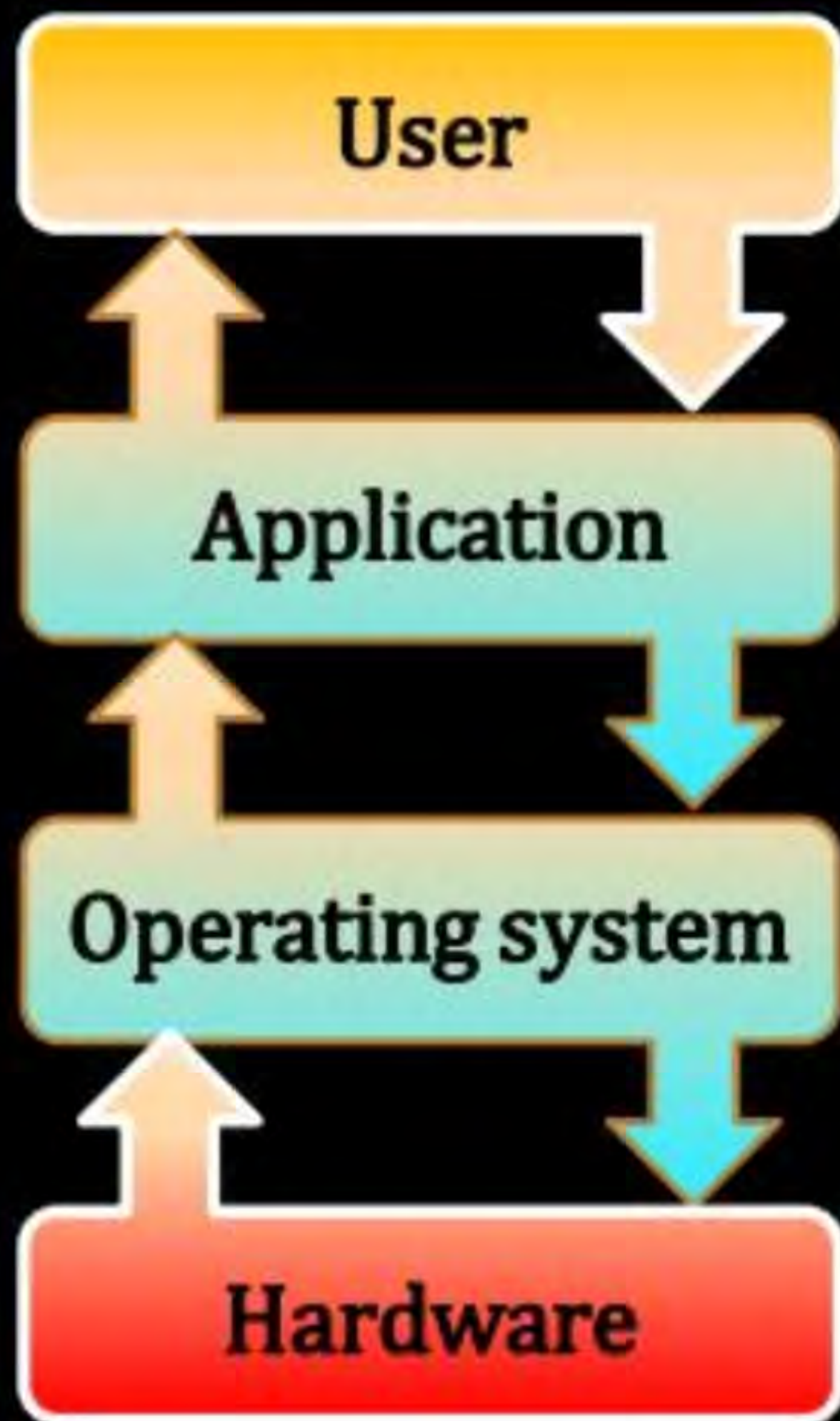


→ OS is a Collection of utilities to simplify user/Prog appl. development

→ O.S acts like a Govt.

→ OS is a Control Program(s) [Supervisor]



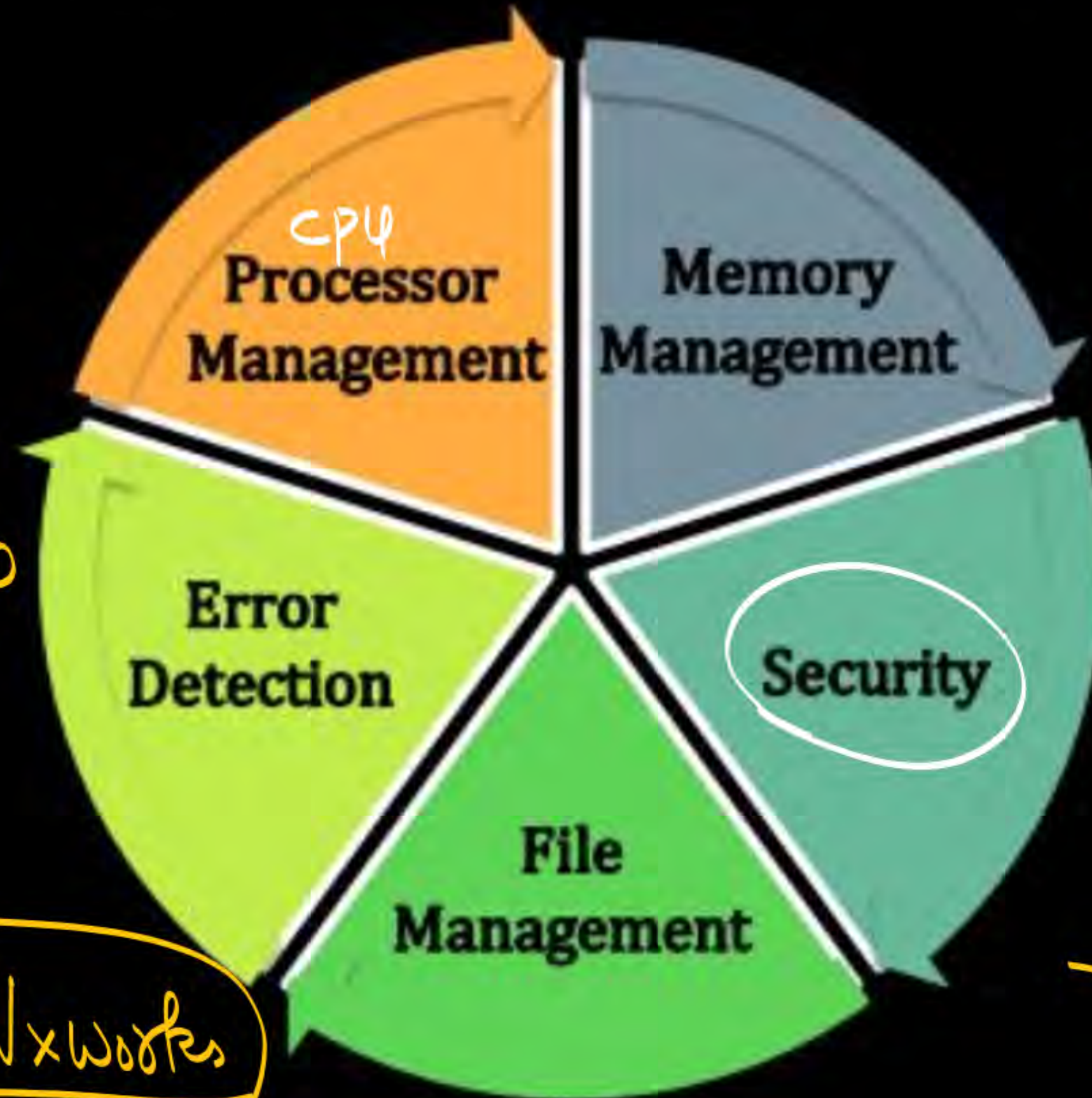




# Functions of Operating system



Functions &  
Goals → Primary



2) Real Time Systems (RTS)  
→ operate in strict deadlines

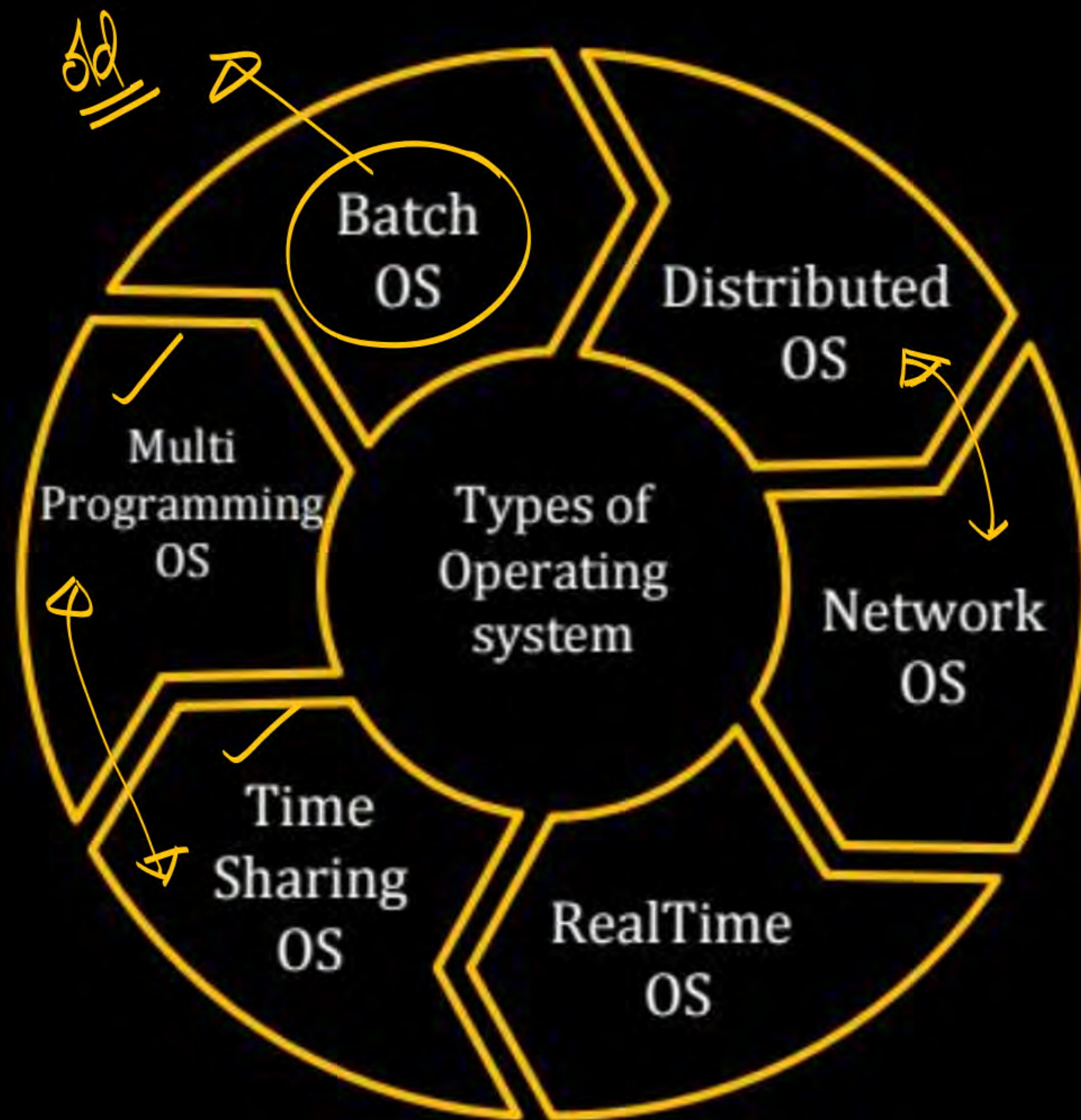
→ Satellite  
→ missile  
→ Nuclear

RTOS: Vxworks

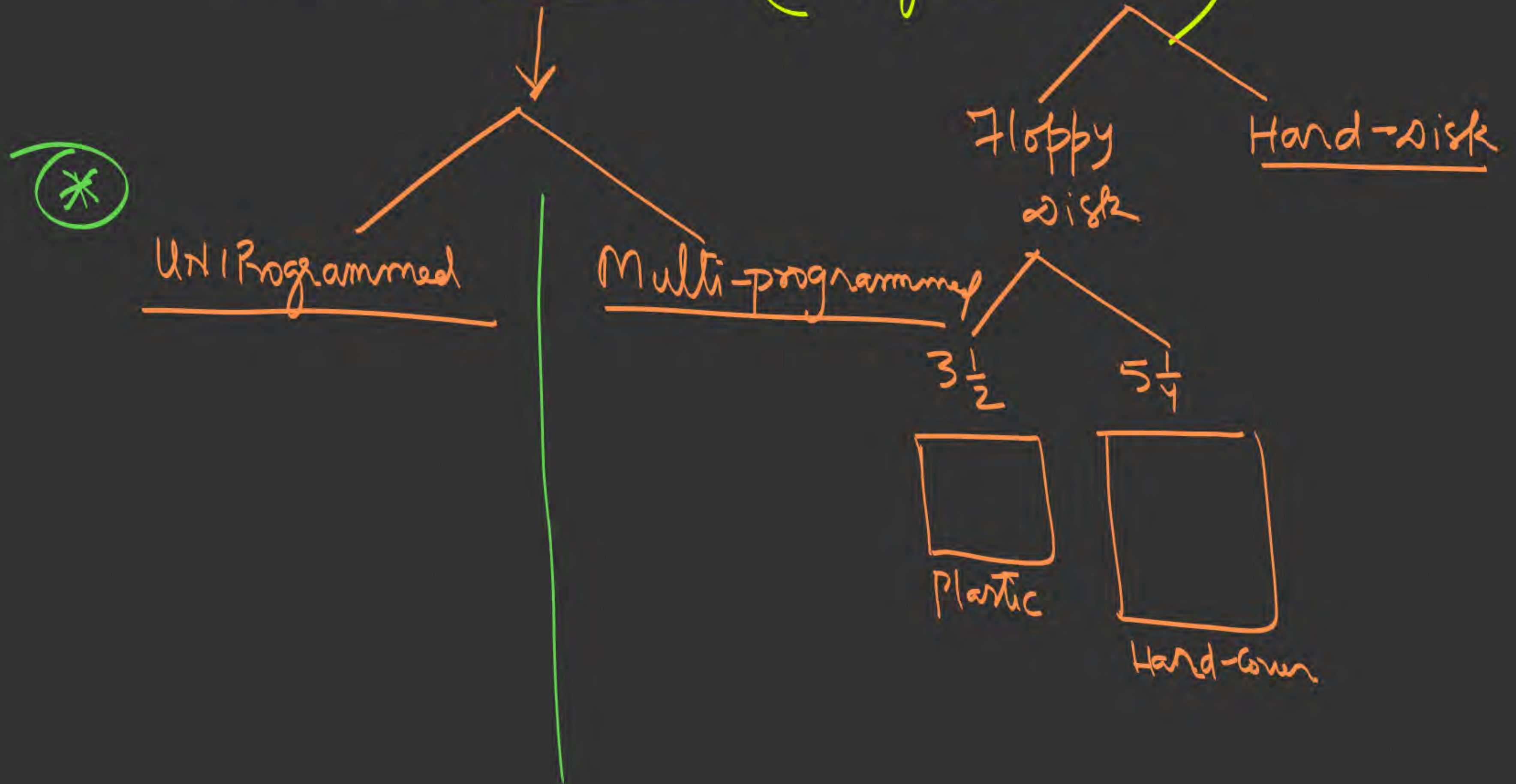
1. Convenience ✓ P
2. Efficiency ✓
3. Robustness
4. Reliability
5. Scalability ✓
6. portability

P.C

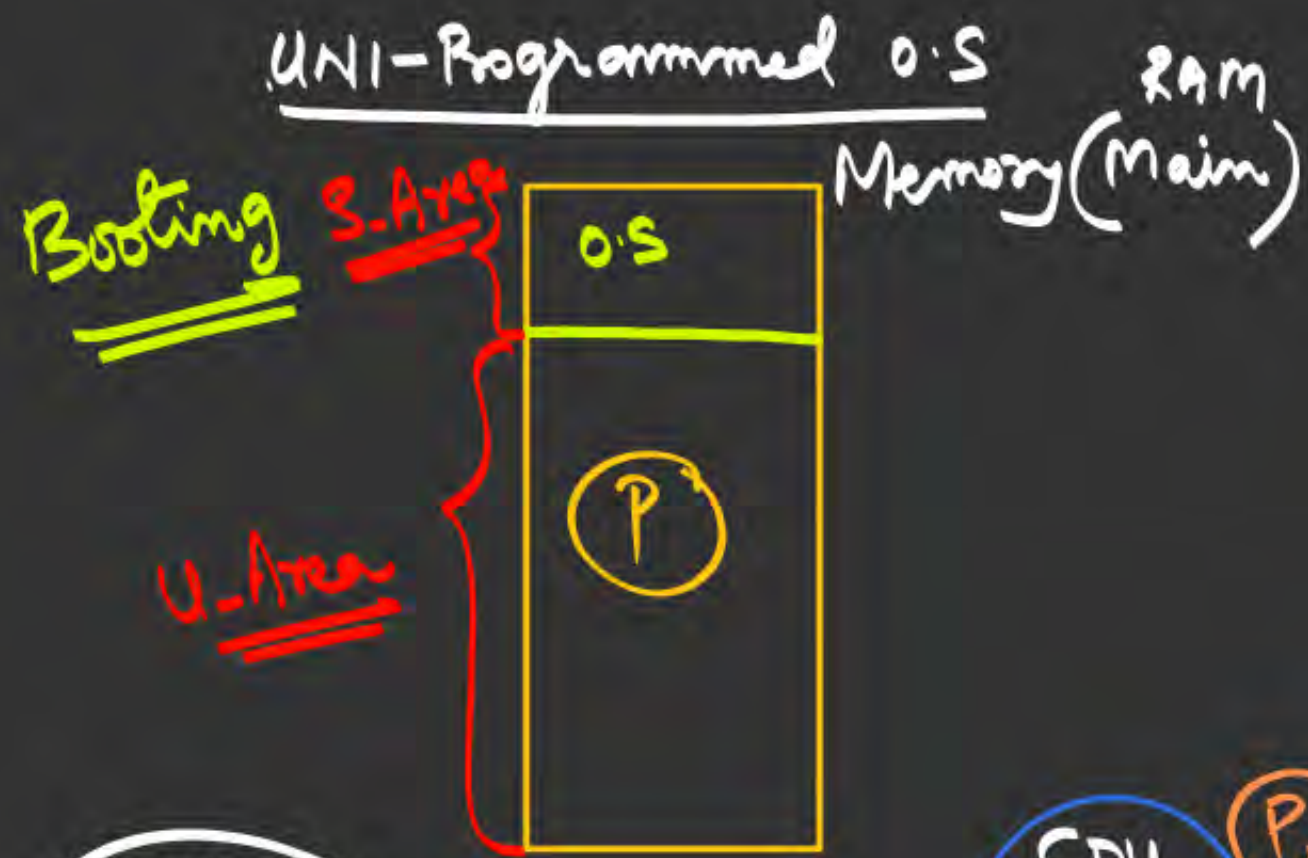




3<sup>rd</sup> Gen → 1950's - 60's (Magnetic disk)





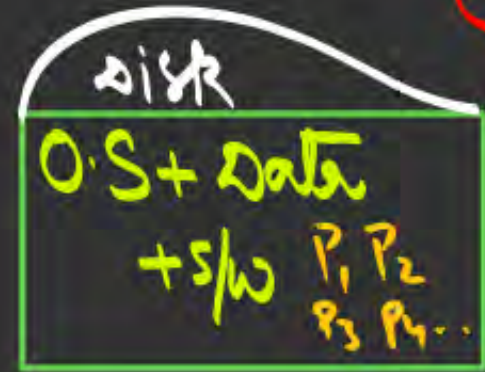


: Ability of O.S to Load & Manage a Single Program in Memory

Limitation:

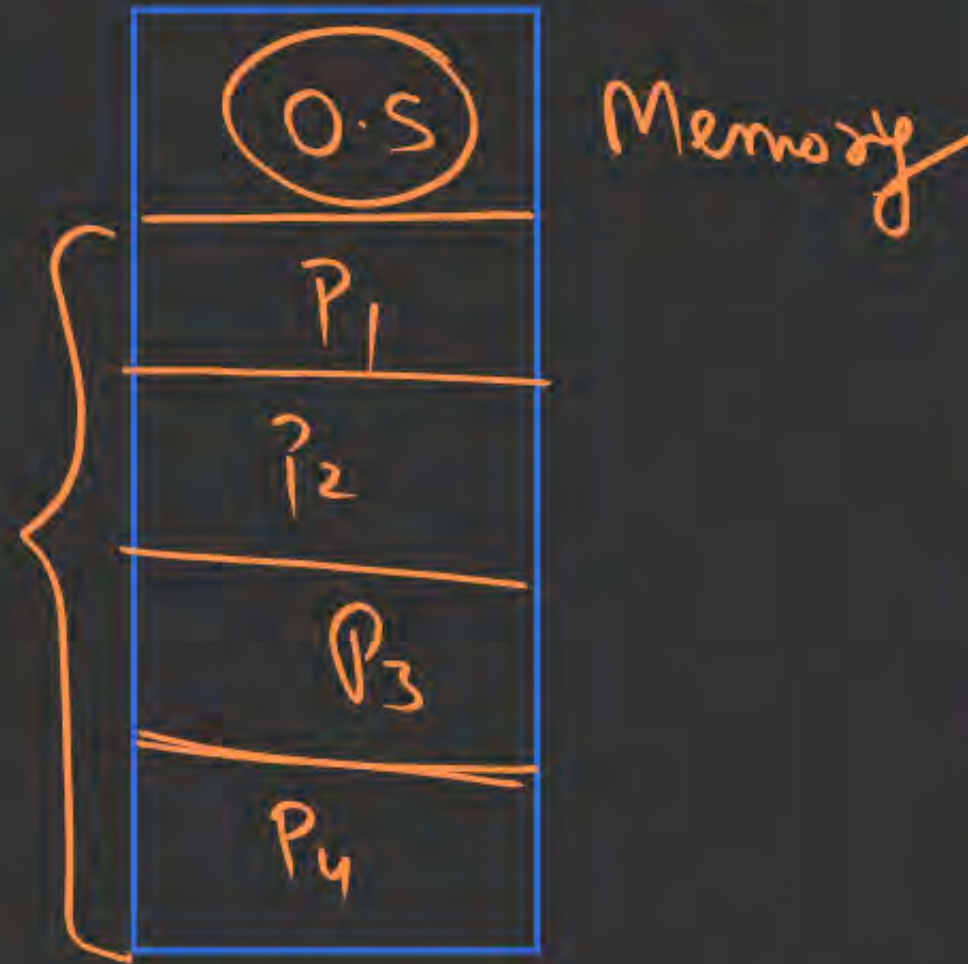
→ Idleness of CPU

↓  
Throughput  
Efficiency



(DOS)  
→ disk O.S

User Area



## Multiprogramming

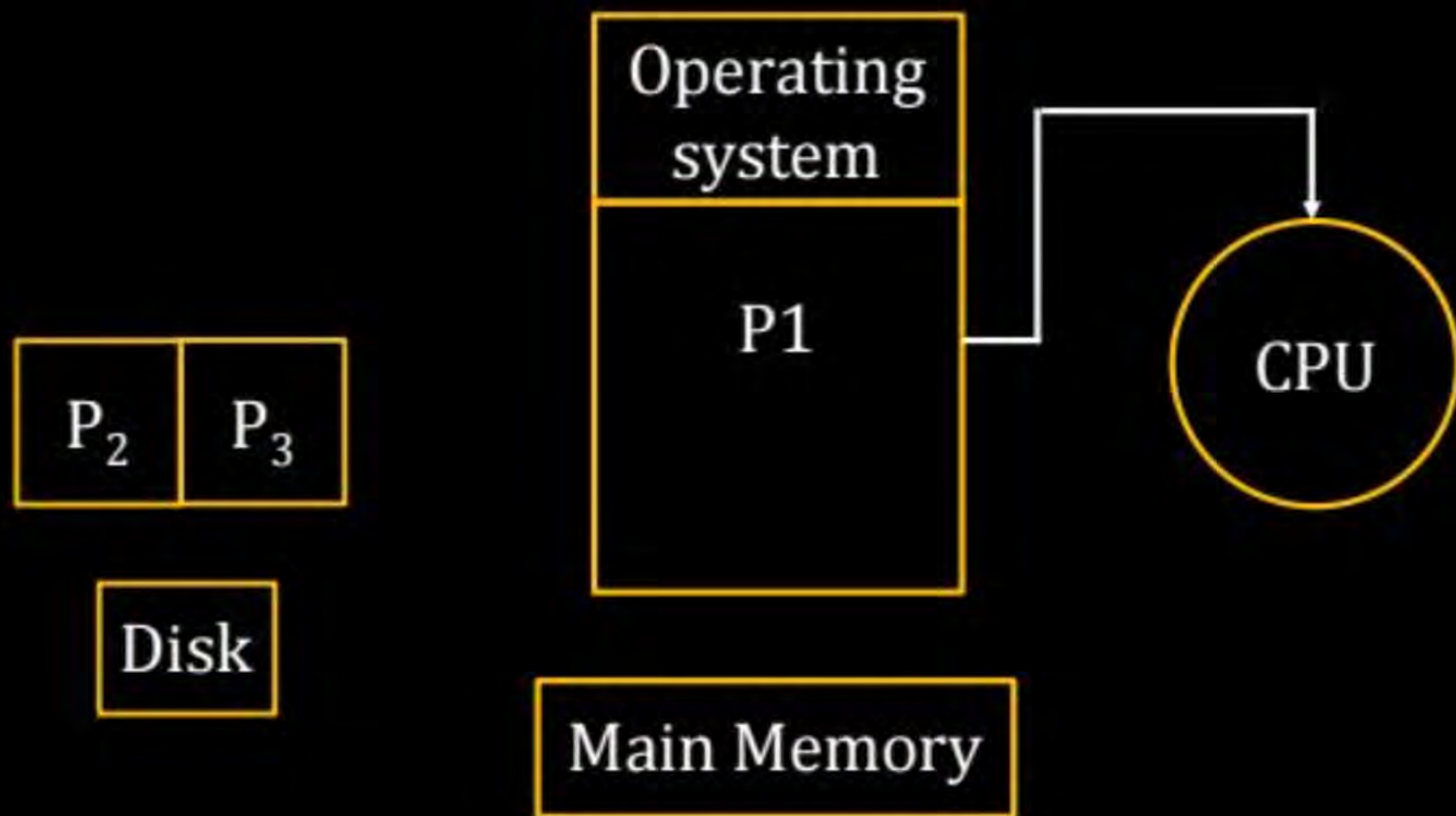
: Ability of O.S to hold/Manage multiple Ready to run Programs in Memory

↓  
More CPU utilization

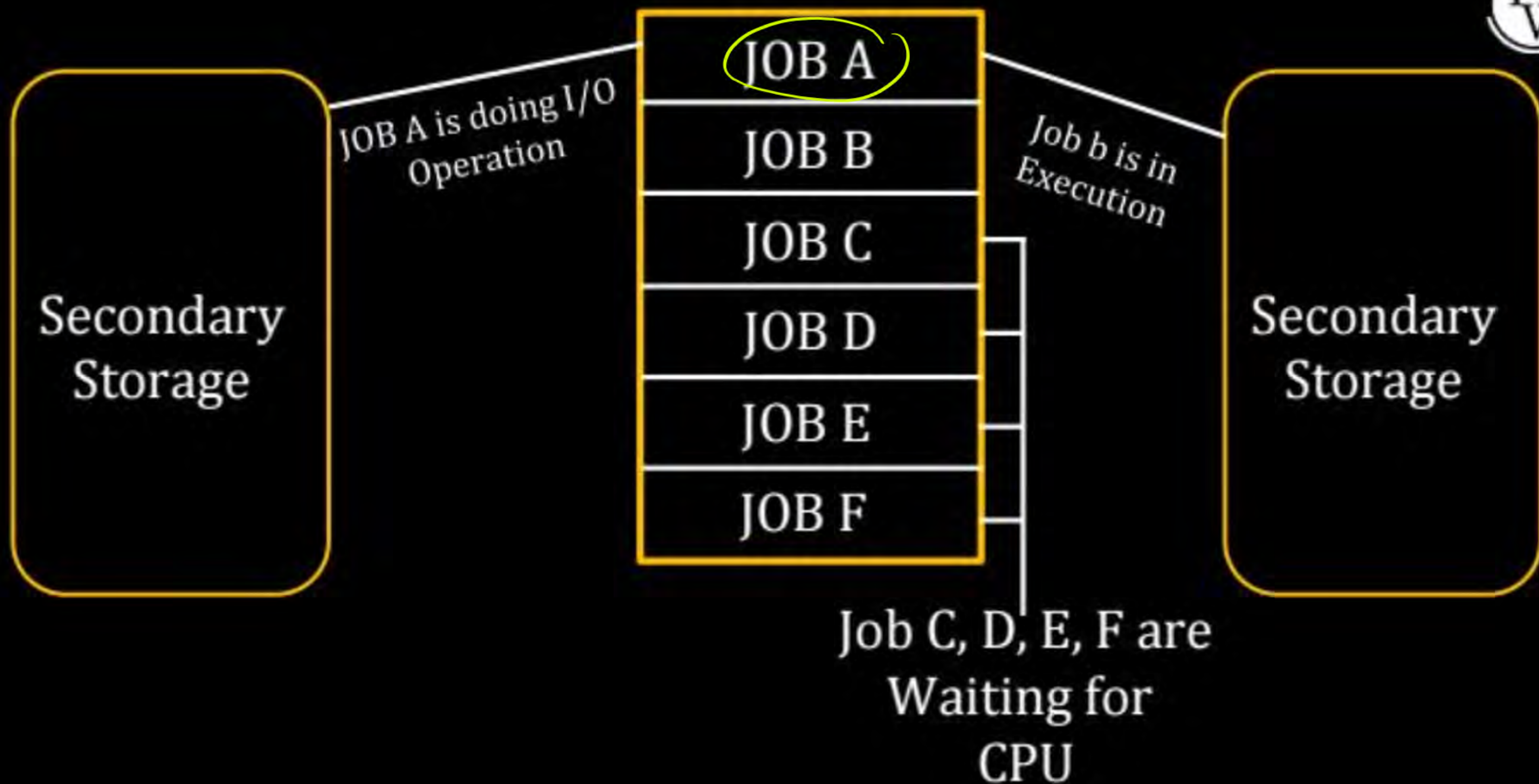
(Enhance Throughput  
Efficiency)

(UNIX + WIN  
LINUX +  
MAC)











# Types of Multiprogramming (M.P.)

UNIX + LINUX + WIN + MAC

→ No-Forceful  
dealloc (voluntary)

(\*)

Non-Preemptive

Win 3.0

(\*)

Pre-emptive (Pr)

Forceful  
deallocation

[WIN 95 + ...]

↓  
Improve Interactiveness

→ Complete

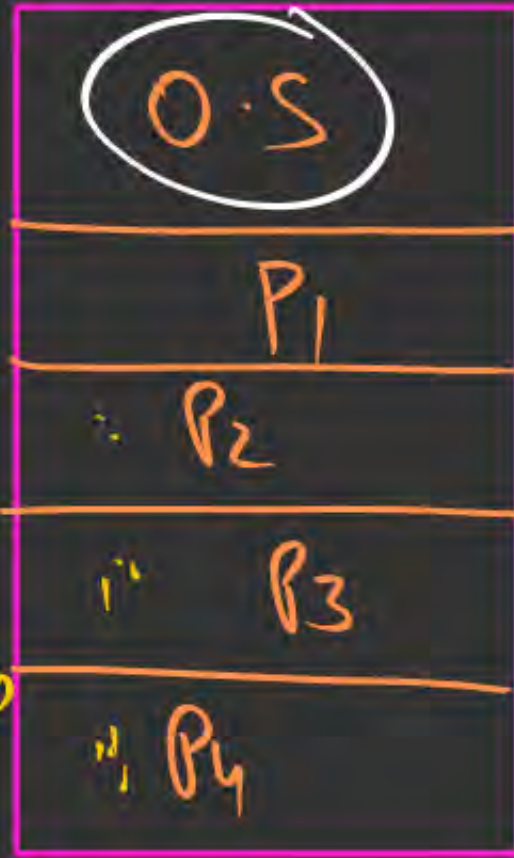
(Time Shared O.S)

→ IO

→ Pre-factor:  $\left(\frac{\text{Time}}{\text{Priority}}\right)$

Pre-based M.P. ~ Multi-tasking  
O.S

Memory



→ Complete  
→ IO/Service (OS)

CPU



Lack of Interactiveness  
Response



# Architectural Requirement for Impl. of a M.Pr. O.S

(H/W Support)

(i) IO (Sec. Storage): D.M.A (Direct Memory access)  
(disk)

(ii) Memory: RAM Address Translation

(iii) CPU: (Dual Mode operation)  
User Mode (um)  
Kernel Mode (km)

