Day 1 – Basic's of COS

Monday, August 18, 2025 3:50 PM

Concept of OS type of exam

Technical modules 8

Module 1 : COSSDM = COS = SDM

Evolution :100 Marks

Type 1 : CEE = 40marks

Type 2 : Internal exam

1 IA : MCQ Test:20 marks

2. Lab :coding : 40 marks

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Date: 18/08/2025
Day 1 : Introduction to OS
COS Session Zoom
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Meeting ID : 841 8521 5610
Key: 123456
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Topics:
    -Introduction to OS
    -Concept of OS
    -Application Software
    -Hardware dependent
    -Components of OS
    -Types of OS
    -Functions of OS
    -User and Kernel space & model
    -Interrupts & system calls
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Notes - for concept of operating system

Module – 1

Introduction of OS

1 There are lot of Os systems that are present in the market that are as follows –

a. Linux
b. Android
c. Ubunt
d. Windows

OS is program that is communicate with a user

System Software – All that apps that are automatically installs once we install OS

Eg, Notepad , Wordpad.

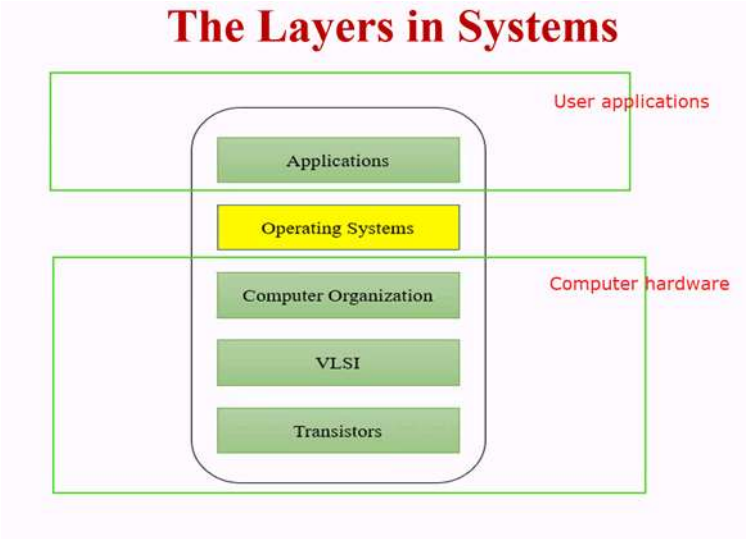
Application software – All apps that are performs users task it is called as application software.

Eg –, Chrome, Office.

Operating system definition – Is a program that manages computer hardware

It is also provides a basis for application programs and acts as a intermediary between user and computer

Below are the Layers present in system

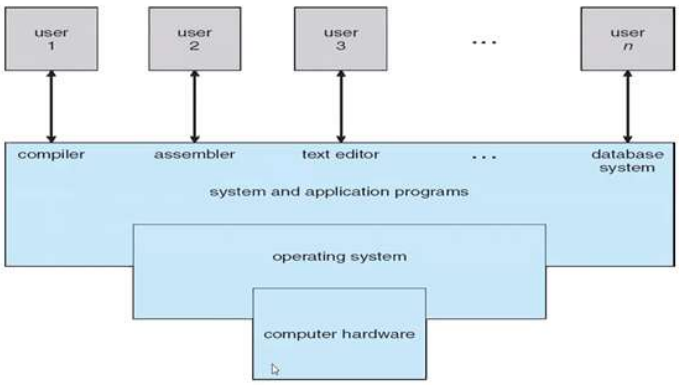


Computer abstraction – without giving any details

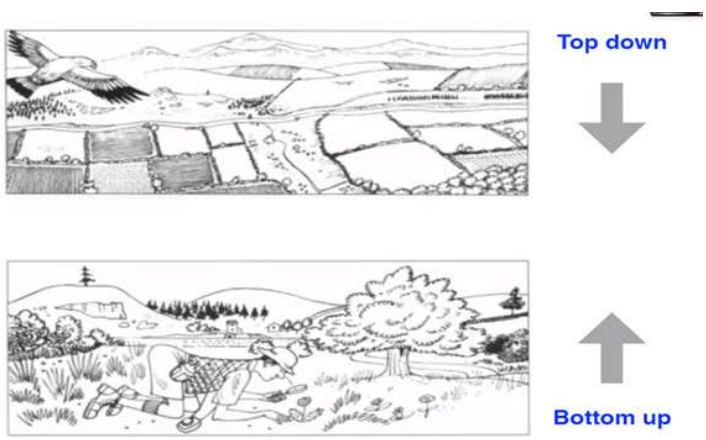
Resource management – OS automatically gives support to the application

Bus – it is a pipleline that communicate with the diff layers

- 1st layer – User layer
- 2nd layer application program
- 3rd OS
- 4th Hardware



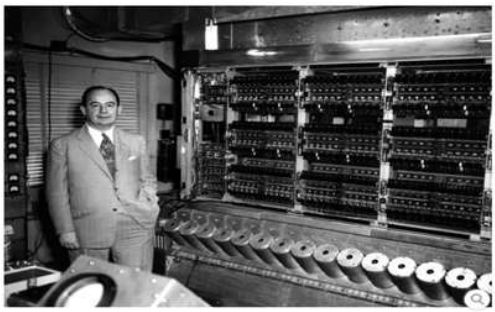
Two approaches – for kernel



1. **Top down – Gives normal details not micro**
2. **Bottom up –** Gives Micro details

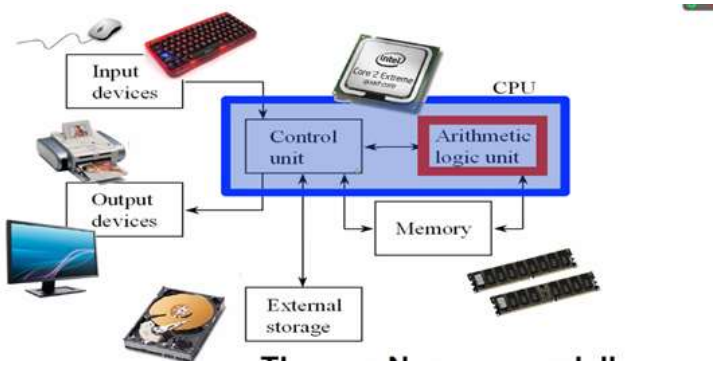
KeRnel – one simple program which runs all the time in computer in form of (shell script)

First generation computer –



John von Neumann with the IAS Computer

Von Neumann persuaded IAS to expand from doing theoretical studies to building a real computer, with meteorology calculations as a key test of its scientific value. The cylinders at the bottom are the Williams–Kilburn memory tubes.



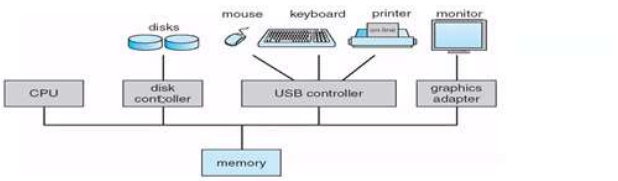
Input output bus –

CPU Bus - Processing – Mathematical computation

Ideal – No activity of CPU

Busy – CPU is doing tasks

- **Computer-system operation**
  - –One or more CPUs, device controllers connect through common bus providing access to shared memory
  - –Concurrent execution of CPUs and devices competing for memory cycles



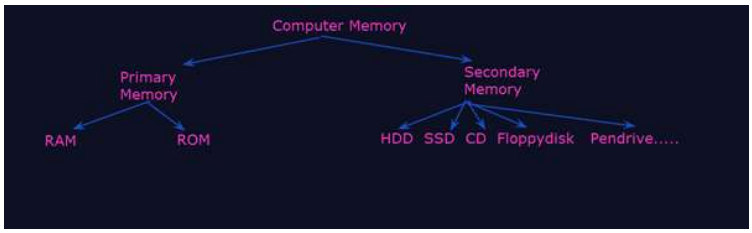
DMA Structure – Direct Memory Access Structure – We use it for High Speed IO actions.

Bootstap loder – Load that application into memory via shell scripting.

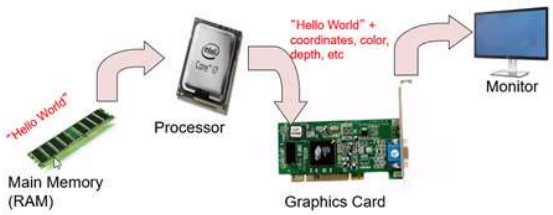
RAM - Volatile memory – It can change – Temporary stored

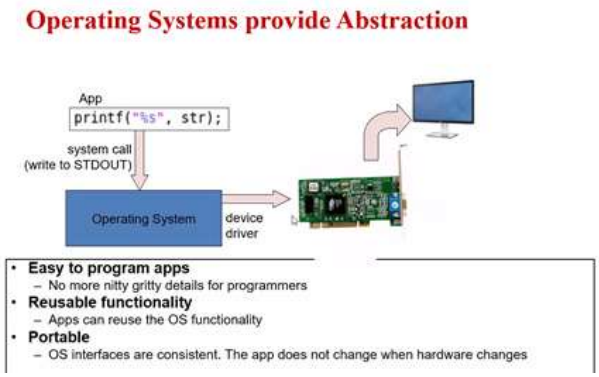
ROM – Once stored we can not edit. Permently stored memory.

- **Primary memory** – Inbuilt memory – RAM, ROM.
- **Secondary memory** – Additional memory

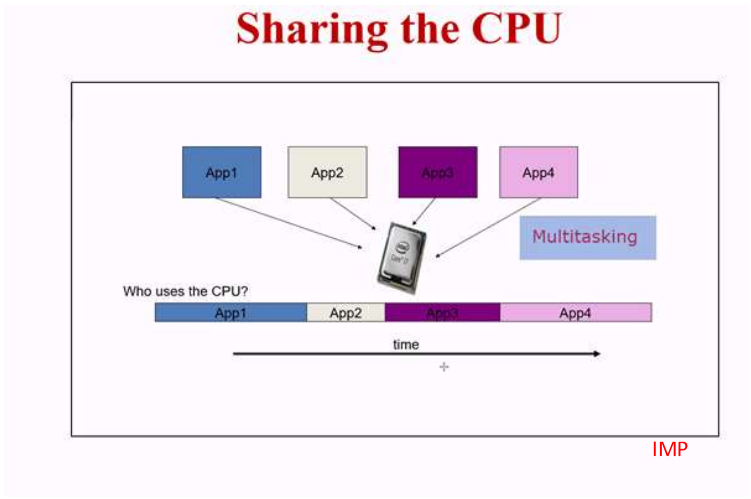


Displaying on the screen!





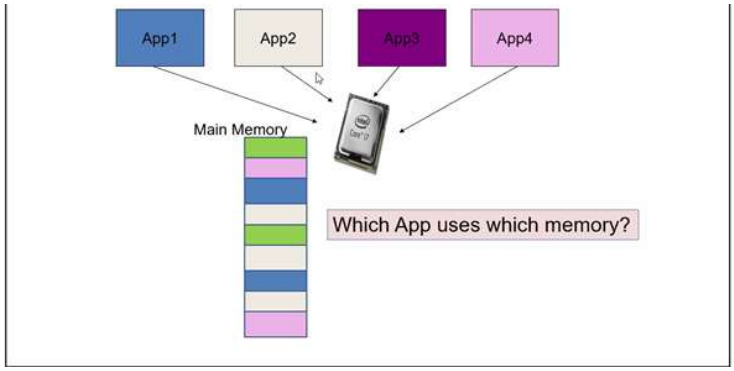
System Call –



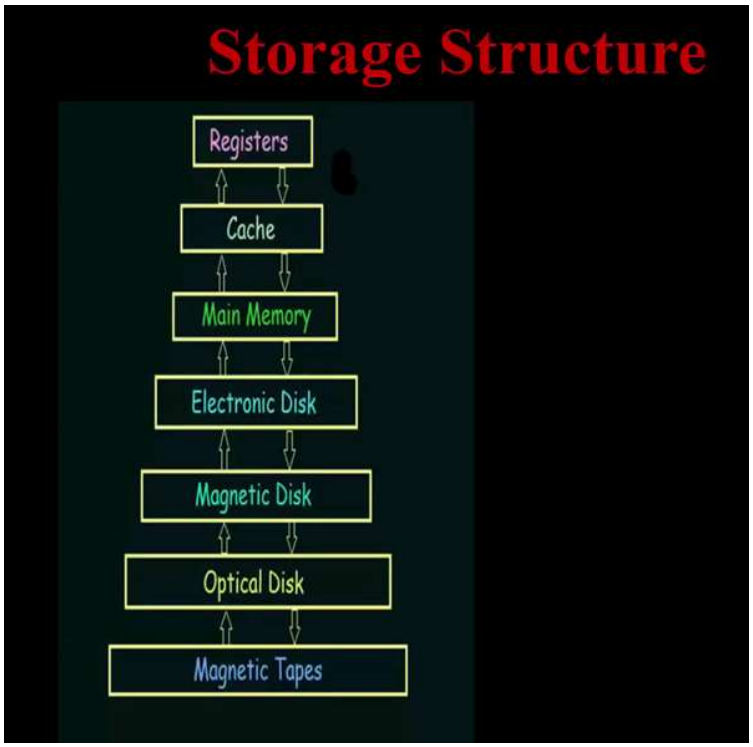
How Computer share's the CPU

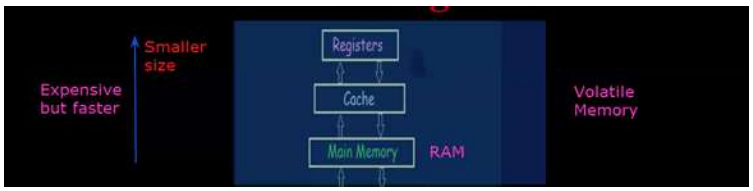
If CPU processer is busy – efficiency is good

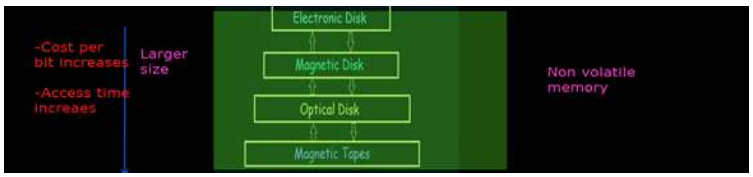
If CPU processor is Ideal – efficiency will be less



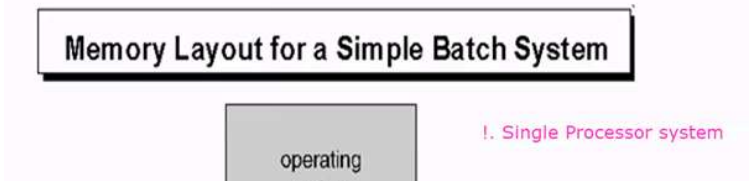
Sharing resources -We Share the same memory between multiple application.

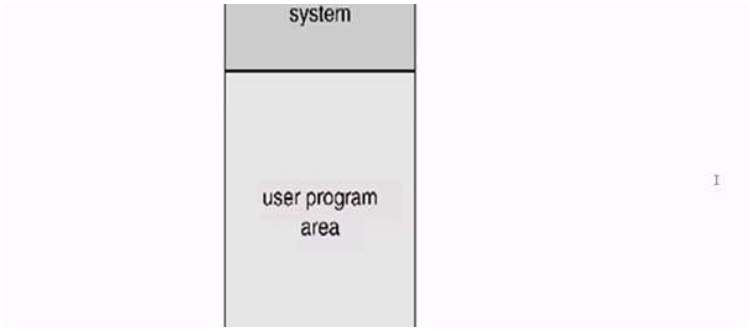






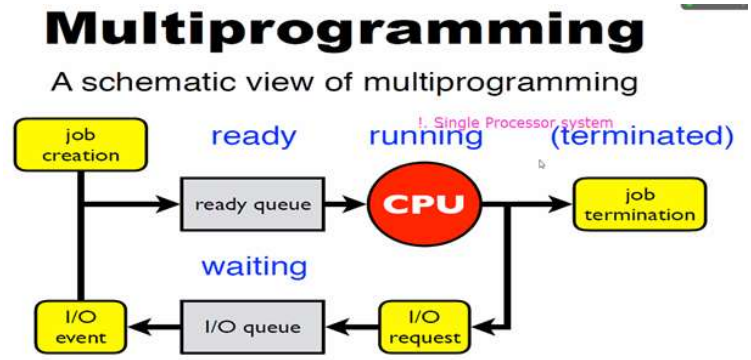
Simple Batch System!



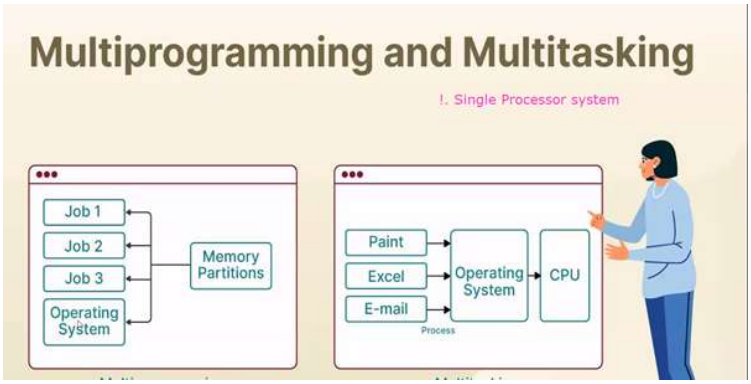


Advantages of batch system – No Communication, between user and OS , No priority, every process is equal.

Multiple Programming!

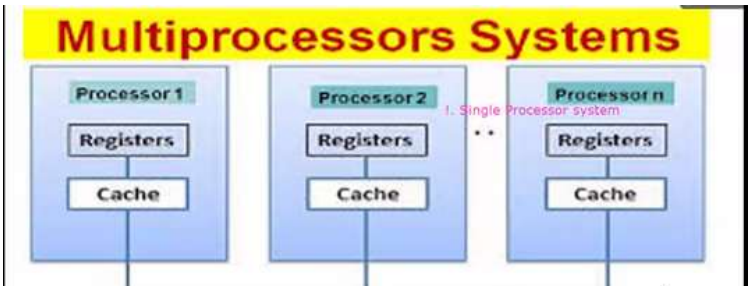


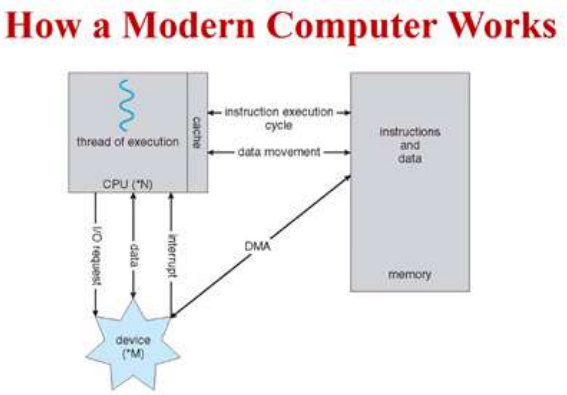
Difference between Multiprogramming and Multitasking



Multiprocessor System –

- Client- server architecture
- Peer to peer architecture
- Symmetric Multiprogramming
- Asymmetric Multiprogramming





Interrupt – It is an event usually defines as it alters the sequence of instructions executed by a processer

Halt – Stop processor

With interrupt

1. Instruction Fetch
2. Instruction execution
3. Check Interrupt

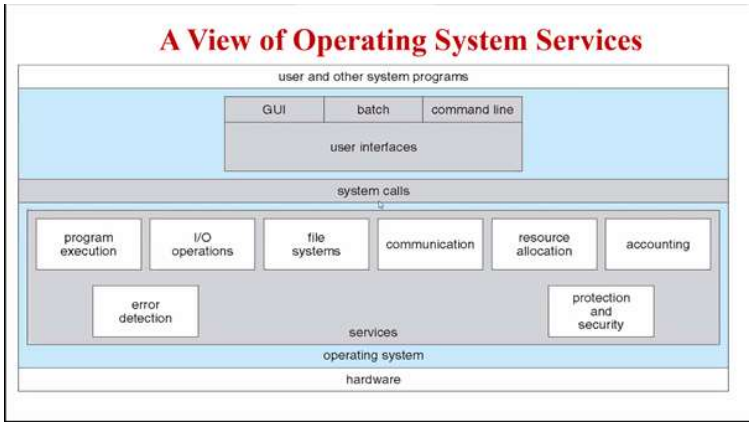
Interrupt Handling Technique

1. Polling
2. Vectored interrupted system

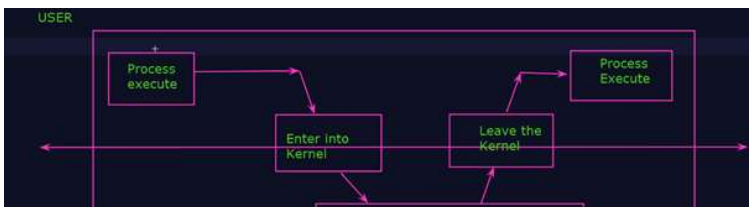
Kernel level interrupt –OS automatically interrupt because of priority.

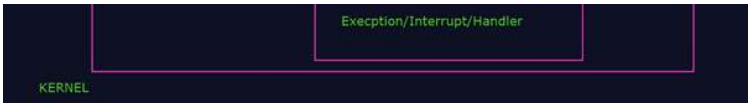
User level interrupt – User it self interrupts because of priority task.

User mode – Kernal mode



How User mode and Kernel mode works : Diagram is below.





System Calls :

System Calls

- Programming interface to the services provided by the OS
- Typically written in a high-level language (C or C++)
- Mostly accessed by programs via a high-level Application Program Interface (API) rather than direct system call use
- Three most common APIs are Win32 API for Windows, POSIX API for POSIX-based systems (including virtually all versions of UNIX, Linux, and Mac OS X), and Java API for the Java virtual machine (JVM)
- Why use APIs rather than system calls?

(Note that the system-call names used throughout this text are generic)
