Monday, March 21, 2022 9:03 AM

OS = Operating System
Define the OS !!!

Program = Finite set of instructions
Software = Is a set of programs

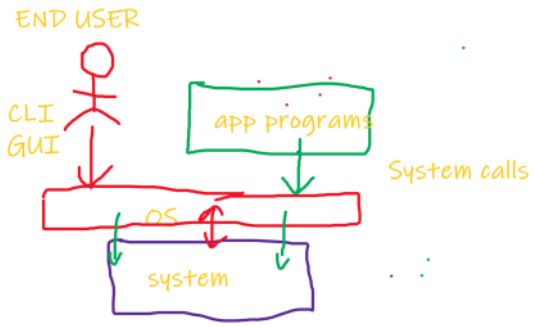
System Software = s/w that work along with the system , may be to manage or interact with the system
Ex = OS, Drivers ,Compilers, Interpreters , Loaders, Linkers ,Network Adaptors
Application Software = s/w that works to solve user's problems
Ex = MS OFFICE, Browsers,Players, notepad, GAMES, Calculator, Hotel Menu , Maths Util , Railway Reservation, Library mgmt, Speech Recognitiion, to do list, complaint portal, blood bank, text to speech synth , shopping…

WHAT IS OS ?
OS is a System Software
OS is a middle layer or an interface that interacts between

1. System and End User (human)- **CLI (command line interface) or GUI (graphical user interface)**
2. System and Program User (application software) - **system calls**

OS performs system management through following modules

1. memory management
2. Process management
3. disk and IO management (Drivers)
4. Security (Authentication and Authorization)



BIT = **B**inary dig**IT** **= 0 , 1**

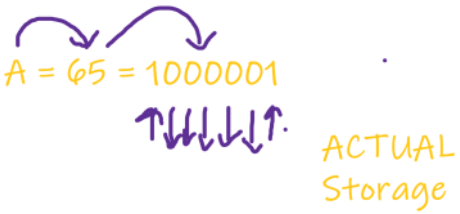
8 bits = 1byte
1024 bytes = 1Kb (Kb = Kilo bytes , KB = Kilo Bits)
1024 Kb = 1Mb
1024 Mb = 1 Gb
1024 Gb = 1Tb

WHAT is a SYSTEM ? HARDWARE

1. Secondary Storage
   HDD = Hard Disk Drive
   SSD = Solid State Device

   Non volatile storage = VALUES are retained even if power shuts down or power on

   Capacity = 1TB of Hard disk , 512 GB
   Material HDD = Al disk coated with **Fe (magnetic material ---- magnetic dipoles)**



HW ---- Find out how the data is stored in SSD , material of SSD

Access time is much slower than primary storage!!!!!

2. Primary Storage - RAM (Random Access Memory) , Memory ,Primary Memory, Main Memory
   Volatile storage = Value is retained ONLY till power on. Lost of power off

   Capacity = 4Gb , 8Gb, 16 Gb
   Access time is much faster than the secondary storage
   Material = flip flops , capacitors , Semiconductor

1. CPU - Central Processing Unit
   i. Storage ---------- REGISTERS = FAST ACCESS STORAGE
      Small = 32 bits = 4 bytes OR 64 bit = 8 bites or 128bit = 16bytes

      IR = Instruction Register = One instruction is stored at a time
      PC = Program Counter = address of the next instruction in RAM
      DR0/DR1 = Data Register 0 and 1 = each data register holds the data (operands of the instruction)
      ADR0, ADR1 = Address of Data 0 and 1

   Ii) Executor ---------- ALU = Arithmetic and Logic Unit

      Types of Instructions
      a. CPU Instructions
         These are the instructions that ALU(electronic circuits) can execute
         1. Arithmetic Instruction = + - * / %
         2. Logical Instruction = && || & | ^ !
         3. Relational instructions= == < > <= >= != ? :

b. IO Instructions
printf()
scanf()

CPU can execute only cpu instructions ----- ONE instruction at a time

Statement is in the RAM	3 + 4
IR	+
DRO	3
DR1	4
Accumulator	7

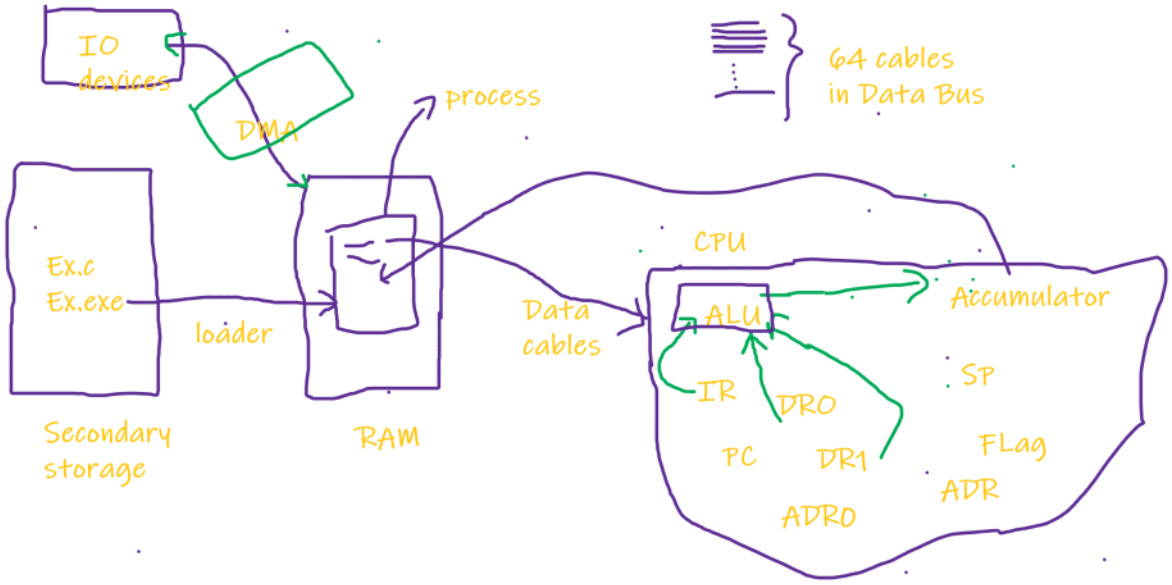
2. IO Devices = Input devices = mouse keyboard joystick pd , camera , mic , scanner (finger print, retina , face , barcode) , card readers

output devices = screen , pd , speaker , charger, printer , modem, projector

IO Instruction = read from Input device , write to output device
These are handled by another processor = IOProcessor , DMA (Direct Memory Access) controller (without using CPU directly data is moved from Input device to RAM and RAM to o/p device)

Input device ------->RAM----------> Output device

1. Cache Storage
2. Connecting Cables


IO devices
DMA
process
64 cables in Data Bus
Ex.c
Ex.exe
loader
Secondary storage
RAM
Data cables
CPU
ALU
Accumulator
IR
DR0
SP
PC
DR1
Flag
ADR
ADR0