- Types of operating systems

Multi user OS
1) single tasking OS → a user
2) multi tasking OS → (one user multiple tasks)

Single user OS
1) multi processing OS (more than 1 cpu/core)
  ↳ real time → 1 → 1 task (critical)
  ↳ time sharing → 2 → 2 task (critical, non critical)
  ↳ multi core → ↳ 3 → 3 task (critical, non critical, critical)
  ↳ no time sharing → ↳ tasks processing at same time
  ↳ time → 1 task

Multiprocessing
↳ tightly
↳ loosely

↳ 1 core
↳ 2 core

Multi tasking
1 core → 2 logical core
1 core → 2 threads
AMD → Symmetric

Multi user OS
1) Multi OS → multi user
2) Embedded OS → multi tasking, multi user
3) Real time OS → no delay, critical processing
4) Batch OS
  jobs → group of jobs → batch → all jobs in a group
  ↳ jobs → process
5) Spool OS
  Queue OS → channelwise
6) Server OS

↳ Boot process

1) power on
2) load the Bios
Test: Power on self Test (POST)
3) load Boot loader → MBR (loc of OS)
  system powerd off → OS → (Hard disk)
  ↳ load the OS
4) System initialization
  (RAM)
5) login Screen
  ↳ Authentication → verify the identity
  OS
  Authorization → access level / permissions

↳ Types of Boot
1) cold / hard boot → start after a shutdown
2) warm / soft boot → Reboot

↳ Single Boot → 1 H/w → 1 OS
↳ Dual Boot → 1 H/w → windows, linux
↳ Multi Boot → 1 H/w → windows, linux, mac

↳ Examples of OS
- Windows
- Linux
- MAC
- IOS
- Android
- Unix

Day 2: Module 2: Introduction to windows OS

History of Windows Desktop
↳ Desktop version
↳ server version
↳ phones

1) Windows 1.0 (1985)
  MS DOS trend
2) windows 2.0 (1987)
  MS office → trend, used
3) windows 3.0 / 3.1
  huge GUI
4) windows 95
  - Multi tasking
5) windows 98
  - Internet Explorer
  - usb support
6) windows ME
  ↳ Multimedia
7) windows NT (new technology)
  ↳ NT kernel
8) Windows 2000
  ↳ business oriented
9) windows xp
10) windows vista
11) windows 7 (NT 6.1)
  ↳ perf
  ↳ stability
12) windows 8
13) windows 8.1
14) windows 10 (NT 10.0)
  ↳ 2015 / 2016
15) windows 11 (NT 10.0)

History windows Server

1) Windows 3.1 (1993) → NT → enterprise ever
2) windows 3.5
3) windows 4.0
4) windows 2000 (Active Directory)
5) " 2003 (IIS → web server)
6) " 2003 R2
7) " 2008 (Hyper-V, Powershell)
8) " 2012 → cloud integration, Server Manager
9) " 2016 → Docker Support
10) " 2019 → K8s "
11) " 2022 → Azure integration, hybrid infrastructure

* windows Desktop vs windows Server

Windows Desktop	Windows Server
Home, Pro, Pro workstation, Enterprise	Standard, Datacenter, Essentials, Azure Edition
20	50
Pro → 2	Datacenter → unlimited
Pro workstation → 4	Standard → 2
Enterprise → 4	Essentials → 25 users, 50 devices
Home → 1	Hyper-V → unlimited VM
1 Windows Update	Azure → Stack
20 g	Linux → Snap
17 Desktop	Hyper-V
2TB, 16 RAM	2TB, 16 RAM

* Important folders in windows
1) program files → 64 bit applications
  ↳ for 3rd party, standard, config of
2) program files x86 → 32 bit applications
3) program data → used to store data generated by the app
4) users → personal data, profile settings
  back ups → 1 backpacker → Documents, Downloads, Pictures, music
  C:\users\ Sam\Desktop
5) windows → os files, 3rd party system data, boot files
  ↳ system32
  ↳ Drivers, Boot

* Imp System information
1) System Type / task

32 bit	64 bit
Data → 1 cpu cycle = 32 bits	64 bits
Memory → 4.1 GB RAM	8 GB
ram → slow	faster, high multitasking
OS → 32 bit App	32 bit App (backward comp)
use case → Gaming	64 bit App
Cy → 2^32	Power of 2^64

2) 11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz 2.42 GHz
  Model → no. of cores
  clock speed
  64 → type tasks
  → 64 bit cpu
  cpu cycle → time of 1 pulse
  → 2.1 GHz / 1 GHz
  1 GHz → 1 Billion cpu cycle (time)
  ↳ 2 → 2 core "ON" / turned
  ↳ 4 → 4 core "ON" / turned
  ↳ 8 → 8 core "ON" / turned
  ↳ 16 → 16 core "ON" / turned
  ↳ 32 → 32 core "ON" / turned
  ↳ 64 → 64 core "ON" / turned
  ↳ 128 → 128 core "ON" / turned

3) Windows desktop 10/11 → stand alone, pc, workgroup, domain

Sleep

→ low power state
→ saved to the RAM (fast capability)
→ "quick resume"
→ Switches off → HD, CPU, ↓
→ USE case → break period
→ Example: any key

Hibernate

→ write to sys → current session → saved into HD
→ completely power off the system
→ longer periods of productivity
→ ↑ wait resume work
  w/o losing or saving
→ use → leave folder (sleep mode)

Module 3: User & Group Management in windows

User → entity → login to OS
  → create / run apps etc
  → user account → username, password → authentication, authorization

Types of users
1) local user → specific to a machine
2) Domain user → access the group → centralized
3) Microsoft user → Microsoft account

Standard User → limited access
Administrator → full access & permissions
Guest (read permission) → temp user

Active Directory
→ Domain service → centralized domain
→ identity management use
→ popularly in windows OS
→ org → manage employees → records, devices

Groups (windows)
↳ coll. of user accounts

Why? → management
  → permissions

* Types of groups
1) local groups (specific to a machine)
2) Domain groups → Corporate Env → AD
3) Built-in groups eg: Administrators