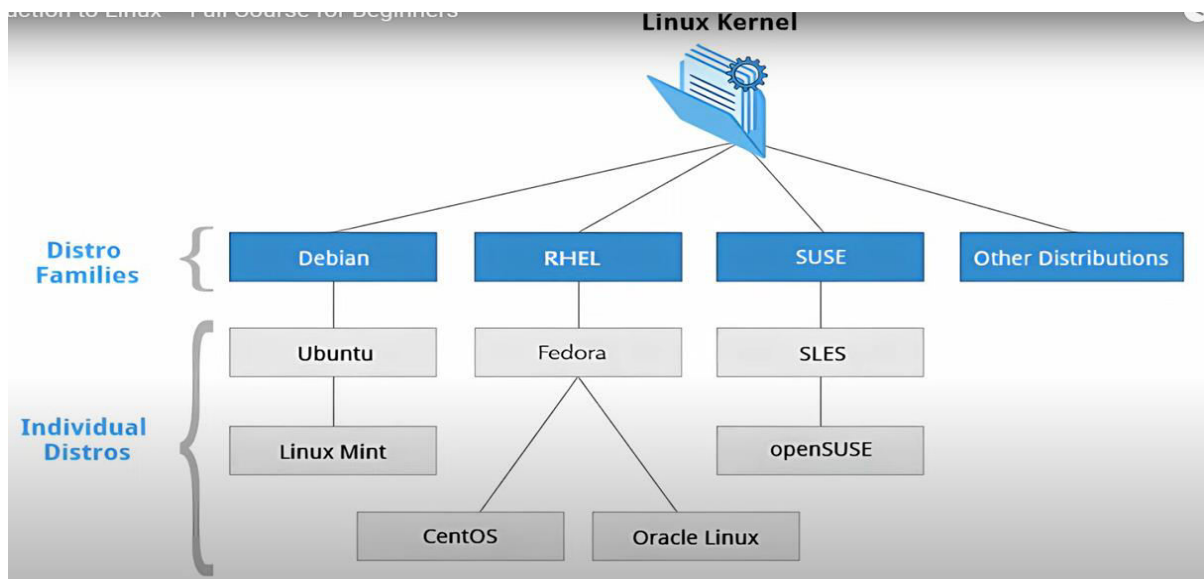# LINUX Operating System

**Chapter 1: Linux Distribution Families:**

- RedHat Enterprise Linux (RHEL) Family Systems: ex. Fedora, CentOS, Oracle Linux
- SUSE: SUSE Linux is of German origin, its name being an acronym of "Software und System-Entwicklung" (software and systems development) ex. OpenSUSE
- Debian Family: ex. Ubuntu, LinuxMint, KaliLinux

Chapter 2: Linux Philosophy and Concepts

→ (man <topic> in terminal for help)

- Kernel: Glue between hardware and applications
- Distribution: Kernel + Softwares making up the OS
- Boot Loader: That boots the OS to the working memory ex. GRUB and ISOLINUX
- Service: Program that runs as a background process ex. Httpd, ntpd, ftpd, named, etc
- Filesystem: Method of storing and organizing files ex. Ext3, FAT, NTFS, Btrfs
- X window System: GUI in Linux
- Console: Hardware + Kernel + CLI/Shell
- GUI: Desktop (KDE, Window Manager, X window System)
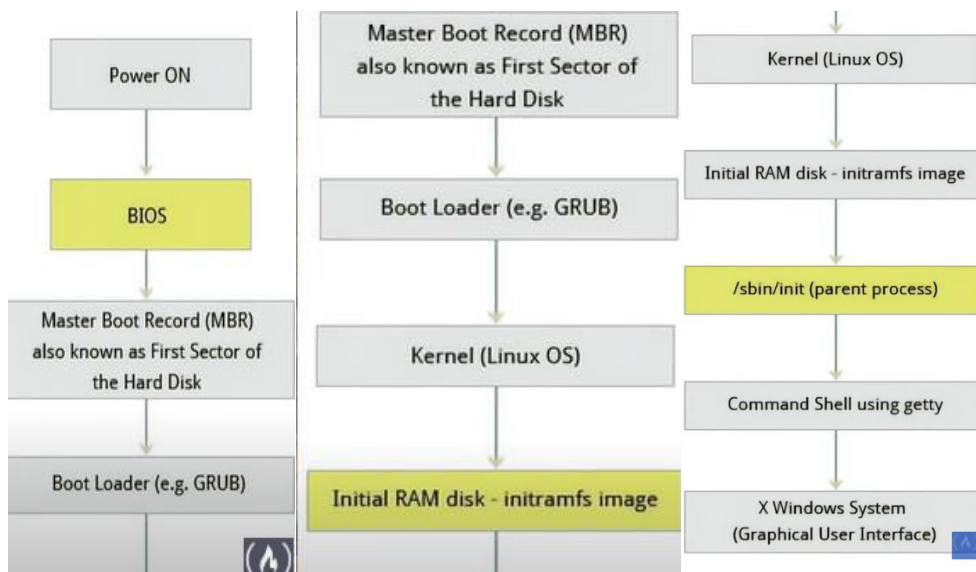
GNOME (GNU Network Object Model Environment) is a desktop environment and graphical user interface that runs on top of a computer operating system. It is composed entirely of free and open-source software, making it a popular choice for Linux distributions.

Command Line Interface:

Common syntax: Command options arguments (COA)

Ex. ls -a /home/angela

BASIC OPERATIONS
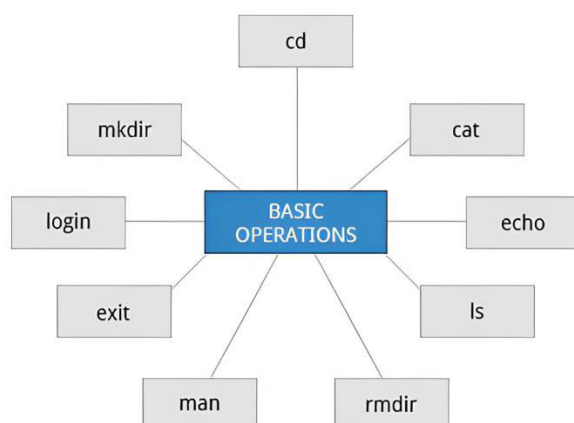
- shutdown -r → To restart
- shutdown -c → To cancel shutdown
- echo $HOME → to find path of default directory
- pwd → Displays the present work directory

- cd or cd~ → Change to your home directory
- cd .. → Change to parent directory
- cd - → change to previous directory
- cd /path → changes your current directory to path specified
- (linux uses / whereas windows uses \ to branch directories)
- tree -d → to list the directories
- ls → lists the contents of the present working directory
- ls -a → lists all files including hidden files
- touch path/file_1 → To make a new file name file_1
- rm -rf directory → to remove a directory along with the files

Processes:

Process Type	Description	Example
Interactive Processes	Need to be started by a user, either at a command line or through a GUI.	**bash, firefox, top**
Batch Processes	Automatic processes which are scheduled from and then disconnected from the terminal.	**updatedb, ldconfig**
Daemons	Server processes that run continuously.	**httpd, sshd, libvirtd**
Threads	Lightweight processes. These are tasks that run under the umbrella of a main process, sharing memory and other resources.	**firefox, gnome-terminal-server**
Kernel Threads	Kernel tasks that users neither start nor terminate and have little control over.	**kthreadd, migration, ksoftirqd**

Networking commands:

Networking Tools	Description
ethtool	Queries network interfaces and can also set various parameters such as the speed
netstat	Displays all active connections and routing tables; useful for monitoring performance and troubleshooting
nmap	Scans open ports on a network; important for security analysis
tcpdump	Dumps network traffic for analysis
iptraf	Monitors network traffic in text mode
mtr	Combines functionality of ping and traceroute and gives a continuously updated display
dig	Tests DNS workings; a good replacement for host and nslookup