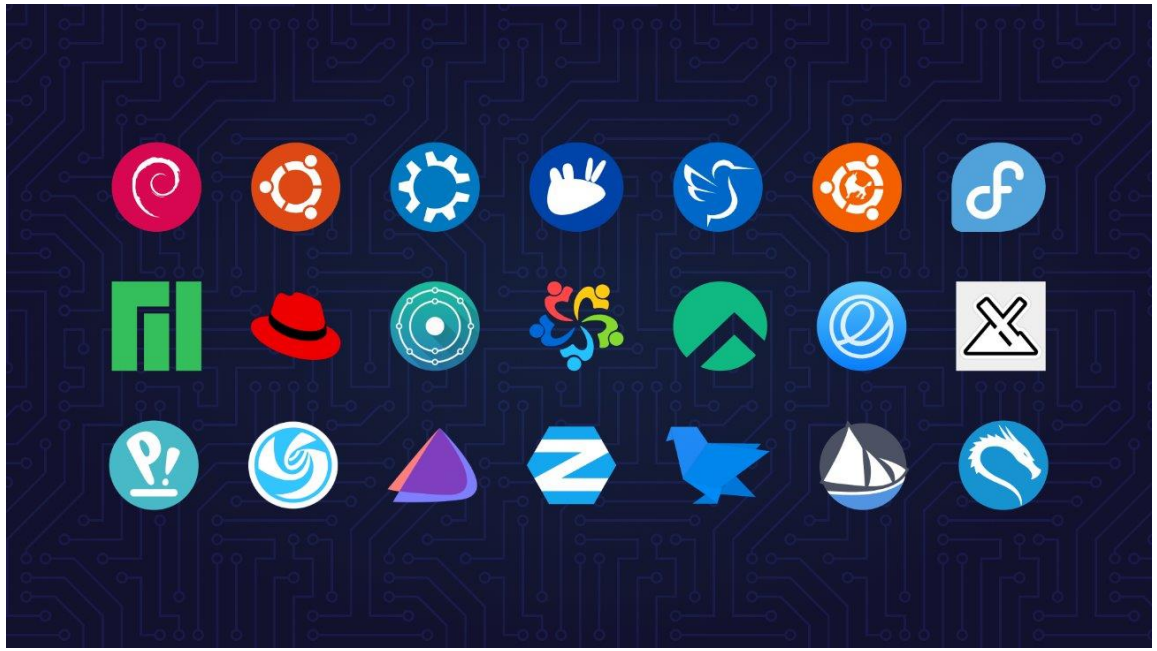
# INTRODUCTION TO LINUX

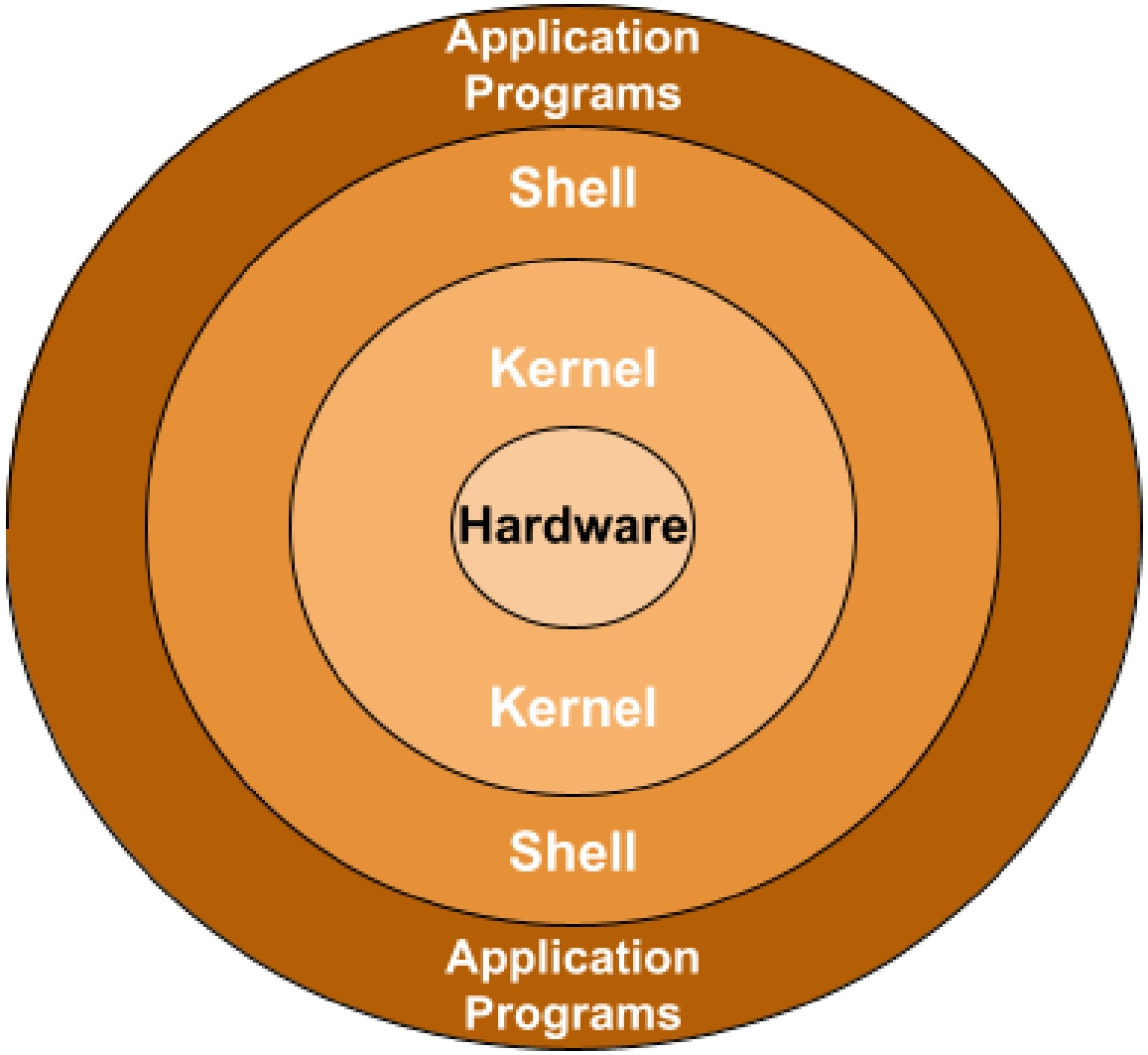
# WHAT IS LINUX?

- Linux is a family of open-source, UNIX-like Operating Systems.
- Technically, "Linux" refers to the kernel.
- Multiple distributions are built around the Linux kernel: Ubuntu, Fedora, Arch, Debian, etc.



# STRUCTURE OF A LINUX OS

- **Hardware:** Physical components (CPU, Memory, I/O Devices)
- **Kernel:** Core of OS (Manages memory, processes, files, devices)
- **Shell:** Interface between user & kernel (e.g., bash, zsh)
- **Applications:** Software tools (e.g., browsers, editors, players)



# FEATURES

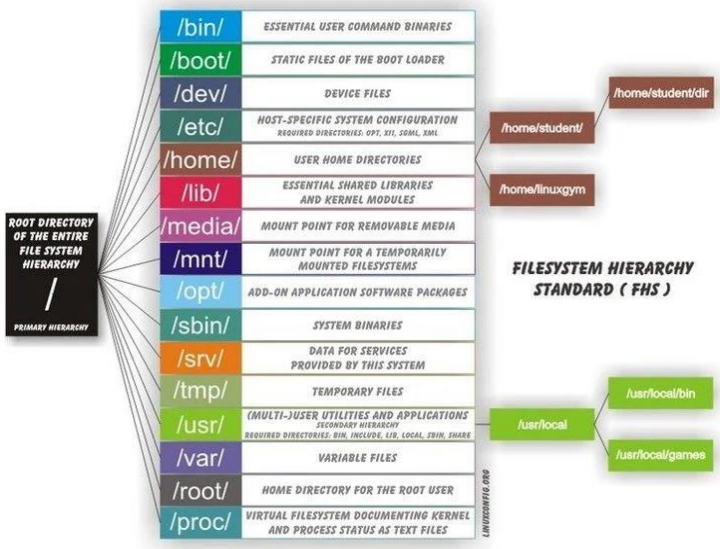
- **Portable**: Runs on any hardware
- **Open Source**: Free and community-driven
- **Multi-user & Multiprogramming**
- **Secure**: Regular updates, fewer vulnerabilities
- **Hierarchical File System**

# BOOTING PROCESS

- BIOS/UEFI Initialization
- Bootloader Execution (GRUB, etc.)
- Kernel Initialization
- Initramfs Loads
- System Initialization (systemd/init)
- Runlevel/Target Execution
- User Login & Shell Access

# FILE SYSYTEM HIERARCHY

- **/:** Root directory : The main directory of the OS
- **/bin**: Essential binaries
- **/etc**: Config files
- **/home**: User directories
- **/var**: Variable data
- **/usr**, **/tmp**, **/mnt**, **/media** and more



# GUI IN LINUX

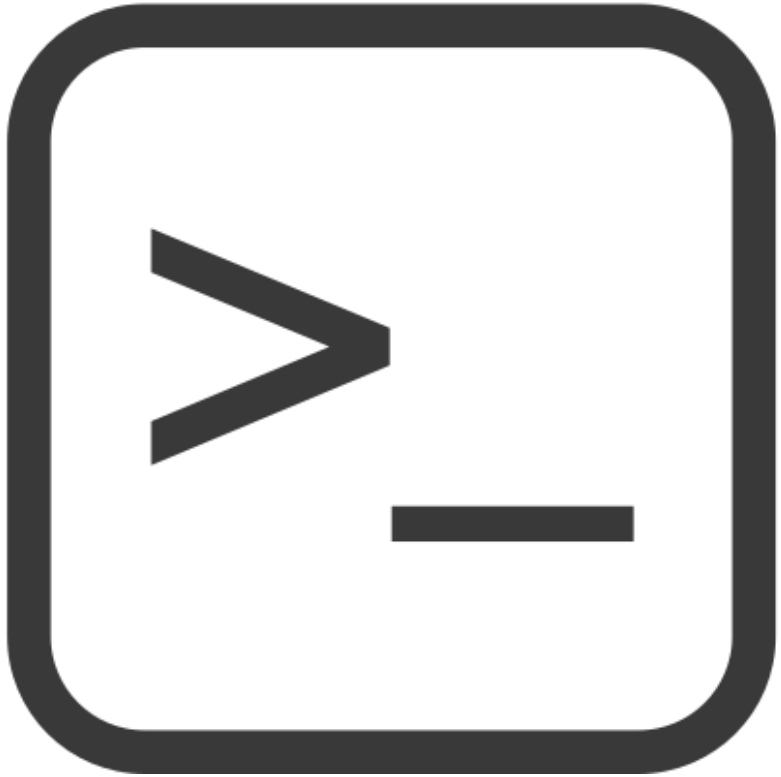
- **Window Managers**: i3wm, dwm, hyprland
- **Desktop Environments**: GNOME, KDE, XFCE, MATE
- Lightweight GUI vs full GUI experience

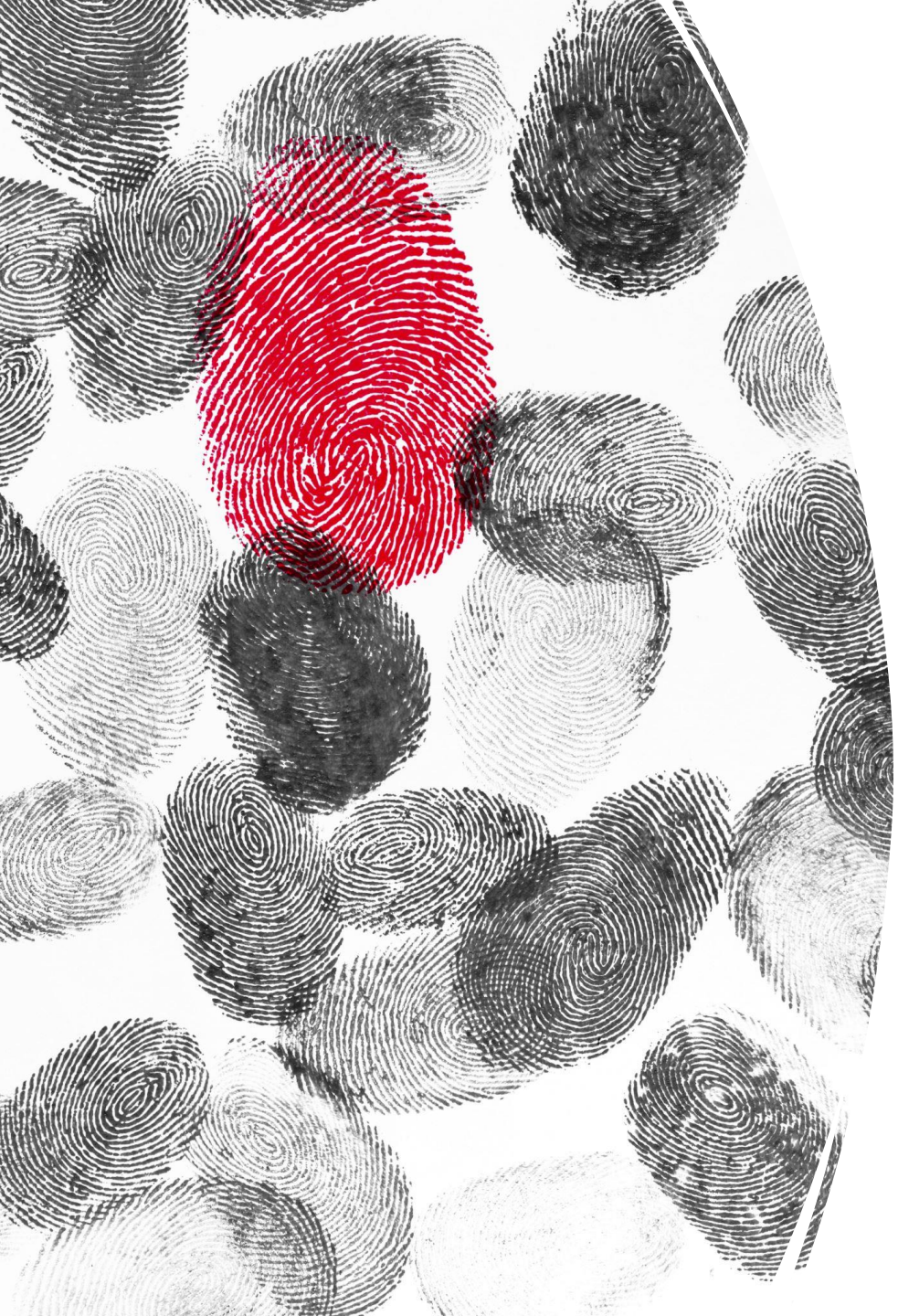
# BASIC LINUX COMMANDS

- `whoami`: Current user
- `pwd`: Print working directory
- `ls`, `ls -a`, `ls -l`: List directory contents
- `cd`: Change directory
- `mkdir`, `rmdir`: Make/remove directories
- `touch`: Create empty files
- `cat`: Display file content
- `echo`: Output text
- `man`: Command manual
- `uname`: System info
- `cp`, `mv`: Copy/move/rename files
- `rm`, `rm -rf`: Delete files/directories

# REDIRECTION, APPENDING & PIPELINING

- `>`: Redirect output (overwrite)
- `>>`: Append output
- `|`: Pipe output to next command





# QUSTIONS?