LINUX

Linux is an free and Open-source operating system with high security. Linux is multi user based OS.

OPERATING SYSTEM:

An **Operating System (OS)** is the main software that runs a computer. It acts as a bridge between:

User ↔ Applications ↔ Hardware

KERNEL:

*The **kernel is the heart of the OS**.

*It directly interacts with hardware and manages system resources.

***can simply say when our Java program reads a file, the request goes to the kernel, which talks to the disk.

DAEMONS:

***Daemons are background services** that run without user interaction.

*They usually start at boot and keep running.

*Example , When a server automatically backs up data at night, a daemon is doing it.

SHELL:

* The **shell is the user interface to the OS**.

*It lets you communicate with the kernel using commands.

What it does ==>

- Executes commands
- Runs scripts
- Manages files and processes

Example:

```
ls
cd
mkdir
```

These commands are interpreted by the shell.

In Linux we have different types of commands:

- SYSTEM COMMANDS
- HARDWARE COMMANDS
- FILE COMMANDS
- PERMISSION COMMANDS
- USER COMMANDS
- SEARCH COMMANDS
- NETWORKING COMMANDS

SYSTEM COMMANDS:

date → Show date & time
cal → Show calendar
uptime → System running time
top → Live process monitor
htop → Advanced process viewer
ps → Show running processes
kill PID → Stop a process
shutdown → Shut down system
reboot → Restart system

- ## HARDWARE COMMANDS:

lscpu → CPU info
lsusb → USB devices
lspci → PCI devices
lsblk → Disk/partition info

df -h → Disk usage
free -h → Memory usage
uname -a → System info

- **FILE COMMANDS**

ls → List files
pwd → Current directory
cd → Change directory
mkdir → Create folder
rmdir → Remove empty folder
touch → Create file
cp → Copy files
mv → Move/rename files
rm → Delete files
cat → View file content

- **PERMISSION COMMANDS**

chmod → Change permissions

chown → Change owner

chgrp → Change group

umask → Default permission settings

- **USER COMMANDS**

whoami → Current user

who → Logged-in users

id → User ID info

adduser → Add user

userdel → Delete user

passwd → Change password

su → Switch user

sudo → Admin privileges

- **SEARCH COMMANDS**

find → Find files/folders

grep → Search text in files

locate → Quick file search

which → Command location

- **NETWORKING COMMANDS**

ping → Test connectivity
ifconfig → Network details (older)
ip a → Network details (modern)
netstat → Network stats
ss → Socket statistics
curl → Fetch data from URL
wget → Download files

DIRECTORY COMMANDS
pwd → show current directory
ls → list files/folders
ls -la → detailed + hidden files
cd dir → change directory
cd .. → go back one level
mkdir dir → create directory
rmdir dir → remove empty directory
rm -r dir → remove non-empty directory

COPY COMMANDS
cp file1 file2 → copy file
cp file dir/ → copy file to folder
cp -r dir1 dir2 → copy directory

MOVE COMMANDS
mv file dir/ → move file

mv old new → rename file/folder

CAT COMMANDS

cat file → view file
cat f1 f2 → combine files
cat > file → create & write file
cat >> file → append to file

GROUP COMMANDS

groups → show user groups
groupadd name → add group
groupdel name → delete group
chgrp group file → change file group