# 🧠 BASIC CONCEPTS OF OS & LINUX:

## 🖥 What is Operating System (OS)?

* - It is system software that controls the computer.
* - Manages hardware, files, memory, and applications.
* - Allows user interaction through GUI or terminal.
* - Examples: Windows, Linux, macOS, Android.

## 🧩 What is Kernel?

* - Core part of an operating system.
* - Connects software with hardware.
* - Handles CPU, memory, file system, etc.
* - Types: Monolithic (Linux), Microkernel (Minix).

## 🐧 What is Linux?

* - Open-source Operating System based on UNIX.
* - Free to use and highly customizable.
* - Used in servers, desktops, mobile phones, etc.
* - Popular distros: Ubuntu, Fedora, Debian, Red Hat.

# 💻 BASIC LINUX COMMANDS

## 📂 DIRECTORY COMMANDS

pwd → Show current path

cd → Go to home directory

cd foldername → Move to a folder

cd .. → Go one level back

cd /path/folder → Go to absolute path

📌 Absolute Path: Full path from root (starts with /)

📌 Relative Path: Path from current directory

## 🕒 DATE AND TIME

date → Full date and time

date +%D → Date only (MM/DD/YY)

date +%T → Time only (HH:MM:SS)

## 📚 HISTORY

history → Show all previous commands

## 🧽 CLEAR TERMINAL

clear → Clean the terminal screen

## 📁 FILE & FOLDER COMMANDS

ls → List files/folders

ls -lt → List files sorted by time

ls -lh → List files with sizes

mkdir folder → Create folder

rmdir folder → Remove empty folder

## 📄 FILE CREATION & READING

touch file.txt → Create empty file

echo "Hi Sujoy!" > file.txt → Write to file (overwrite)

cat file.txt → Show file content

## 📄 FILE READING

less file.txt → Scrollable file view

(q → quit, / → search, n → next)

more file.txt → View file line by line

realpath file.txt → Show full path

## ✏ EDIT FILES

vi sujoy.txt

(Press i to insert, Esc to exit insert mode, :wq to save and quit)

nano sujoy.txt

(Edit directly, Ctrl+X → Y → Enter to save)

## 🧹 DELETE FILE

rm file.txt → Delete file

## 📤 COPY / MOVE / RENAME

cp file.txt folder/ → Copy file to folder

mv file.txt folder/ → Move file to folder

mv oldname.txt newname.txt → Rename file

## 📖 READ SPECIFIC LINES

head -5 file.txt → Show top 5 lines

tail -5 file.txt → Show last 5 lines

## 🔠 SORTING & UNIQUE

sort file.txt → Sort lines A to Z

sort -r file.txt → Reverse sort

sort file.txt | uniq → Unique lines only

## 📂 File Splitting

split -l 2 filename

- 📌 Splits a file into chunks of 2 lines each.

- 🎯 Example: If a file has 6 lines, this will split it into 3 files with 2 lines each.

## 🔍 Grep (Pattern Searching)

grep "pattern" filename – 🔎 Searches for a pattern in a file.

egrep "word1|word2" – 🔎 Searches for multiple patterns using extended regex.

Examples:

grep "hello" file.txt

egrep "apple|banana" fruits.txt

## 🃏 Wildcard in Linux

Wildcards help match multiple files easily.

Examples:

ls x\* # Lists all files starting with x

touch file{A..Z} # Creates files: fileA, fileB, ..., fileZ

## 🖥 htop

Interactive process viewer. Better version of top.

## 📁 File Listing & Permissions

ls -lart # Detailed listing sorted by time

chmod 744 filename # Change permissions using numeric codes

🔢 Use an online chmod calculator: https://chmod-calculator.com

## 🌐 Package Management (Ubuntu)

sudo apt update # Update package list

sudo apt install apache2 # Install Apache2 web server

## 📦 Compression & Archiving

gzip filename # Compress file

gunzip filename.gz # Decompress file

## 🔐 Remote Access

ssh user@server\_ip # Connect to remote server

scp filename user@ip:path # Copy file from/to remote server

## 🌐 Networking Commands

ping google.com # Test internet connection

ifconfig # Show network interfaces

netstat # Show network-related info

## ⚙ Processes

ps # Show running processes

top # Show all active processes

kill PID # Kill a specific process by ID

## 👤 User Management

useradd username # Add a new user

## 💽 Disk Info

df # Show mounted disk info

mount # Mount a device

umount # Unmount a device

## 🙋 User Info

whoami # Show current logged-in user