



**BAJRA TECHNOLOGIES**

**DAY WISE  
React/React Native CURRICULUM  
SUYAN SHRESTHA**

# Linux Basics

## DAY1

### Directories

1. Pwd - current working directory
2. Ls - list out all the files and folders in the directed folder.
3. Cd - change directory
4. Mkdir - create your own directory.
5. Rmdir - remove directory

```
supersuyan@supersuyan:~/Ddrive$ cd Bajra_Trainee/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mkdir testtest
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
testtest
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rmdir testtest
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd ..
supersuyan@supersuyan:~/Ddrive$ ls
Bajra_Trainee _SUYAN
supersuyan@supersuyan:~/Ddrive$ pwd
/home/supersuyan/Ddrive
supersuyan@supersuyan:~/Ddrive$ █
```

### Pwd

First of all, symbolic links are special types of files that serve as references or pointers to other files or directories.

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
symlinkDir  targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd symlinkDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir$ ls
targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir$ cd targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir/targetDir$ pwd -L
/home/supersuyan/Ddrive/Bajra_Trainee/symlinkDir/targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir/targetDir$ pwd -P
/home/supersuyan/Ddrive/Bajra_Trainee/targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir/targetDir$ █
```

- a. Pwd -L gives logical path which includes the symbolic link as it was navigated.
- b. Pwd -P gives physical path by resolving the symbolic link to its actual target directory.

## Cd

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
symlinkDir  targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/targetDir$ pwd
/home/supersuyan/Ddrive/Bajra_Trainee/targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/targetDir$ cd /home/supersuyan/Ddrive/Bajra_Trainee/symlinkDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir$ cd ~
supersuyan@supersuyan:~$ cd Ddrive/
supersuyan@supersuyan:~/Ddrive$ cd ~supersuyan/
supersuyan@supersuyan:~$ █
```

## Absolute path and Relative path

- a. An absolute path specifies the location of a file or directory from the root directory (/)
- b. A relative path specifies the location of a file or directory in relation to the current working directory.

Ls

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mkdir lsTrial
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd lsTrial/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ touch .hiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ touch unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls
unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a
. .. .hiddenfile unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -l
total 0
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -l -a
total 8
drwxrwxr-x 2 supersuyan supersuyan 4096 જૂન 4 12:26 .
drwxrwxr-x 6 supersuyan supersuyan 4096 જૂન 4 12:25 ..
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 .hiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -lh -a
total 8.0K
drwxrwxr-x 2 supersuyan supersuyan 4.0K જૂન 4 12:26 .
drwxrwxr-x 6 supersuyan supersuyan 4.0K જૂન 4 12:25 ..
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 .hiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -lhS -a
total 8.0K
drwxrwxr-x 2 supersuyan supersuyan 4.0K જૂન 4 12:26 .
drwxrwxr-x 6 supersuyan supersuyan 4.0K જૂન 4 12:25 ..
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 .hiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ nano unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -lhS -a
total 12K
drwxrwxr-x 2 supersuyan supersuyan 4.0K જૂન 4 12:28 .
drwxrwxr-x 6 supersuyan supersuyan 4.0K જૂન 4 12:25 ..
-rw-rw-r-- 1 supersuyan supersuyan 10 જૂન 4 12:28 unhiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 0 જૂન 4 12:26 .hiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ █
```

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -l --block-size=K -a
total 12K
drwxrwxr-x 2 supersuyan supersuyan 4K જૂન      4 12:28 .
drwxrwxr-x 6 supersuyan supersuyan 4K જૂન      4 12:25 ..
-rw-rw-r-- 1 supersuyan supersuyan 0K જૂન      4 12:26 .hiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 1K જૂન      4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir abc
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -d
.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -d */
abc/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir .hiddenDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -dA */
abc/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a */
. ..
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -A */
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -A
abc .hiddenDir .hiddenfile unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a
. .. abc .hiddenDir .hiddenfile unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ █

```

- Ls -g : include group information in the output, but not the owner information.
- Ls -l : include file permissions, number of links, owner, group, size, and time of last modification.  
Format is kinda like  
-rw-r--r-- 1 user1 group1 398 Feb 9 14:11 file1.txt
- Ls -n : similar to -l but owner and group IDs displayed numerically rather than by name.
- Ls -p : appends a / character to each directory name (-p option), which can make it easier to see which files are directories at a glance.
- Ls -p / : does same as Ls -p, but from root directory
- Ls -lt : same as Ls -l, but sorts the files by modification time, with the newest files first (-t option).
- Ls -IX : sorts the files by extension

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -g
total 8
drwxrwxr-x 2 supersuyan supersuyan 4096 4 12:31 abc
-rw-rw-r-- 1 supersuyan supersuyan 10 4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -l
total 8
drwxrwxr-x 2 supersuyan supersuyan 4096 4 12:31 abc
-rw-rw-r-- 1 supersuyan supersuyan 10 4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -n
total 8
drwxrwxr-x 2 1000 1000 4096 4 12:31 abc
-rw-rw-r-- 1 1000 1000 10 4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -li
total 8
5515722 drwxrwxr-x 2 supersuyan supersuyan 4096 4 12:31 abc
5515720 -rw-rw-r-- 1 supersuyan supersuyan 10 4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -r -a
unhiddenfile .hiddenDir abc ..
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a
. .. abc .hiddenDir .hiddenfile unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -p
abc/ unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -p /
bin/ boot/ dev/ home/ lib64/ lost+found/ mnt/ proc/ run/ sbin.usr-is-merged/ srv/ sys/ usr/
bin.usr-is-merged/ cdrom/ etc/ lib/ lib.usr-is-merged/ media/ opt/ root/ sbin/ snap/ swapfile tmp/ var/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls
abc unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ cd abc
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ touch abcKoFile1
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ touch abcKoFile2
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ touch abcKoFile3
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ cd ..
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -R
.:
abc unhiddenfile

./abc:
abcKoFile1 abcKoFile2 abcKoFile3

```

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -l
total 8
drwxrwxr-x 2 supersuyan supersuyan 4096 4 13:33 abc
-rw-rw-r-- 1 supersuyan supersuyan 0 4 13:37 group1.txt
-rw-rw-r-- 1 supersuyan supersuyan 0 4 13:37 group2.txt
-rw-rw-r-- 1 supersuyan supersuyan 10 4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a -lx
total 20
drwxrwxr-x 2 supersuyan supersuyan 4096 4 13:33 abc
-rw-rw-r-- 1 supersuyan supersuyan 10 4 12:28 unhiddenfile
drwxrwxr-x 4 supersuyan supersuyan 4096 4 13:37 .
drwxrwxr-x 6 supersuyan supersuyan 4096 4 12:25 ..
drwxrwxr-x 2 supersuyan supersuyan 4096 4 12:35 .hiddenDir
-rw-rw-r-- 1 supersuyan supersuyan 0 4 12:26 .hiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 0 4 13:37 group1.txt
-rw-rw-r-- 1 supersuyan supersuyan 0 4 13:37 group2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a
. .. abc group1.txt group2.txt .hiddenDir .hiddenfile unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -a -lt
total 20
drwxrwxr-x 4 supersuyan supersuyan 4096 4 13:37 .
-rw-rw-r-- 1 supersuyan supersuyan 0 4 13:37 group2.txt
-rw-rw-r-- 1 supersuyan supersuyan 0 4 13:37 group1.txt
drwxrwxr-x 2 supersuyan supersuyan 4096 4 13:33 abc
drwxrwxr-x 2 supersuyan supersuyan 4096 4 12:35 .hiddenDir
-rw-rw-r-- 1 supersuyan supersuyan 10 4 12:28 unhiddenfile
-rw-rw-r-- 1 supersuyan supersuyan 0 4 12:26 .hiddenfile
drwxrwxr-x 6 supersuyan supersuyan 4096 4 12:25 ..

```

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls --color=never
abc group1.txt group2.txt unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls --color=auto
abc group1.txt group2.txt unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -lt
total 8
-rw-rw-r-- 1 supersuyan supersuyan 0 ज्यू 4 13:37 group2.txt
-rw-rw-r-- 1 supersuyan supersuyan 0 ज्यू 4 13:37 group1.txt
drwxrwxr-x 2 supersuyan supersuyan 4096 ज्यू 4 13:33 abc
-rw-rw-r-- 1 supersuyan supersuyan 10 ज्यू 4 12:28 unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -ltr
total 8
-rw-rw-r-- 1 supersuyan supersuyan 10 ज्यू 4 12:28 unhiddenfile
drwxrwxr-x 2 supersuyan supersuyan 4096 ज्यू 4 13:33 abc
-rw-rw-r-- 1 supersuyan supersuyan 0 ज्यू 4 13:37 group1.txt
-rw-rw-r-- 1 supersuyan supersuyan 0 ज्यू 4 13:37 group2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ █

```

## Mkdir

- mkdir def/123/efg wont create new directory efg inside, if def or 123 doesnt exist. But, mkdir -p def/123/efg will create parent directories too.
- Mkdir -v : creates a directory and prints a message for each created directory.
- Mkdir -m : specified permissions

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls
abc group1.txt group2.txt unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir def/123/efg
mkdir: cannot create directory 'def/123/efg': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir -p def/123/efg
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls
abc def group1.txt group2.txt unhiddenfile
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ^C
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir -v verboseDir
mkdir: created directory 'verboseDir'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir -m 755 permissionDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -ld
drwxrwxr-x 7 supersuyan supersuyan 4096 ज्यू 4 13:45 .
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ cd verboseDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial/verboseDir$ ls -ld
drwxrwxr-x 2 supersuyan supersuyan 4096 ज्यू 4 13:44 .
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial/verboseDir$ cd ..
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls -l
total 20
drwxrwxr-x 2 supersuyan supersuyan 4096 ज्यू 4 13:33 abc
drwxrwxr-x 3 supersuyan supersuyan 4096 ज्यू 4 13:42 def
-rw-rw-r-- 1 supersuyan supersuyan 0 ज्यू 4 13:37 group1.txt
-rw-rw-r-- 1 supersuyan supersuyan 0 ज्यू 4 13:37 group2.txt
drwxr-xr-x 2 supersuyan supersuyan 4096 ज्यू 4 13:45 permissionDir
-rw-rw-r-- 1 supersuyan supersuyan 10 ज्यू 4 12:28 unhiddenfile
drwxrwxr-x 2 supersuyan supersuyan 4096 ज्यू 4 13:44 verboseDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ █

```

## Rmdir

- a. Rmdir -p : removes parent and subdirectories, basically whole path

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls
abc  def  group1.txt  group2.txt  permissionDir  unhiddenfile  verboseDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ tree def
def
└── 123
    └── efg

3 directories, 0 files
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ rmdir def/123/efg
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ tree def
def
└── 123

2 directories, 0 files
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ mkdir def/123/efg
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ tree def
def
└── 123
    └── efg

3 directories, 0 files
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ rmdir -p def/123/efg/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ ls
abc  group1.txt  group2.txt  permissionDir  unhiddenfile  verboseDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/lsTrial$ █
```

# File System

## Linux File System

- **/ (root filesystem):** It is the top-level filesystem directory. It must include every file needed to boot the Linux system before another filesystem is mounted. Every other filesystem is mounted on a well-defined and standard mount point because of the root filesystem directories after the system is started.
- **/boot:** It includes the static kernel and bootloader configuration and executable files needed to start a Linux computer.
- **/bin:** This directory includes user executable files.
- **/dev:** It includes the device file for all hardware devices connected to the system. These aren't device drivers; instead, they are files that indicate all devices on the system and provide access to these devices.
- **/etc:** It includes the local system configuration files for the host system.
- **/lib:** It includes shared library files that are needed to start the system.
- **/home:** The home directory storage is available for user files. All users have a subdirectory inside /home.
- **/mnt:** It is a temporary mount point for basic filesystems that can be used at the time when the administrator is working or repairing a filesystem.
- **/media:** A place for mounting external removable media devices like USB thumb drives that might be linked to the host.
- **/opt:** It contains optional files like vendor supplied application programs that must be placed here.
- **/root:** It's the home directory for a root user. Keep in mind that it's not the '/' (root) file system.
- **/tmp:** It is a temporary directory used by the OS and several programs for storing temporary files. Also, users may temporarily store files here. Remember that files may be removed without prior notice at any time in this directory.
- **/sbin:** These are system binary files. They are executables utilized for system administration.
- **/usr:** They are read-only and shareable files, including executable libraries and binaries, man files, and several documentation types.
- **/var:** Here, variable data files are saved. It can contain things such as MySQL, log files, other database files, email inboxes, web server data files, and much more.

## File Creation

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat catTest.txt
cat: catTest.txt: No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat > catTest.txt
aile chahi ma lekhiraxu
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat catTest.txt
aile chahi ma lekhiraxu
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat > catTest.txt
yo feri naya
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat catTest.txt
yo feri naya
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ touch touchTest.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ > redirectTest.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "file content ni cmd mai lekhnu paryo" > echoText.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ printf "same to same echo" > echoText.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
catTest.txt echoText.txt lsTrial pkoju redirectTest.txt symlinkDir sysLinktxt.txt targetDir touchTest.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano nanoTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
catTest.txt echoText.txt lsTrial nanoTxt.txt pkoju redirectTest.txt symlinkDir sysLinktxt.txt targetDir touchTest.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ 
```

- a. If we use **cat > name.txt**, then we can write content in cmd. Ctrl+D to save and exit
  - i. If we use **cat name.txt**, we can see content
- b. We can use **touch, redirect(>)** to simple create file
- c. We can use **echo, printf** to create file, while writing content in same cmd line.

- d. We can use **nano** to enter editor mode.

## Linux file

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ file *
catTest.txt:      ASCII text
echoText.txt:     ASCII text, with no line terminators
lsTrial:          directory
nanoTxt.txt:      ASCII text
pkoju:            directory
redirectTest.txt: empty
symlinkDir:       directory
sysLinktxt.txt:   empty
targetDir:        directory
touchTest.txt:    empty
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ file s*
symlinkDir:       directory
sysLinktxt.txt:   empty
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ file s*in*
symlinkDir:       directory
sysLinktxt.txt:   empty
```

## Rm

- a. Rm -r : recursively remove
- b. Rm -rf: forced remove directory
- c. Rm -v : verbose {with message} remove
- d. Rm -d : remove only empty directory
- e. Rm -i : asks for permission , like do you want to remove

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ touch delete1.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ touch delete2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
delete1.txt  delete2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -i delete1.txt delete2.txt
rm: remove regular empty file 'delete1.txt'?
rm: remove regular empty file 'delete2.txt'?
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
pkoju symlinkDir sysLinktxt.txt targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -r pkoju
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
symlinkDir sysLinktxt.txt targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -rf sysLinktxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -v syslinkDir
rm: cannot remove 'syslinkDir': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
symlinkDir targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -v targetDir
rm: cannot remove 'targetDir': Is a directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -v -r targetDir
removed directory 'targetDir'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
symlinkDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd syslinkDir
bash: cd: syslinkDir: No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd symlinkDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir$ ls
targetDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/symlinkDir$ cd ..
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd -d symlinkDir/
bash: cd: -d: invalid option
cd: usage: cd [-L|[-P [-e]] [-@]] [dir]
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -d symlinkDir/
rm: cannot remove 'symlinkDir/': Directory not empty
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ rm -r symlinkDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

## Cp

- a. Cp source\_file destination\_path
- b. Cp -r : will recursively copy contents
- c. Cp –backup : will take backups
- d. Cp -i : to confirm before overwriting

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ touch delete{1..5}.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mkdir txtFiles
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt txtFiles
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp delete1.txt txtFiles/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt txtFiles
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cd txtFiles
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/txtFiles$ ls
delete1.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/txtFiles$ cd ..
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp *.txt txtFiles
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls txtFiles/*
txtFiles/delete1.txt txtFiles/delete2.txt txtFiles/delete3.txt txtFiles/delete4.txt txtFiles/delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mkdir txtFiles2
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp txtFiles1 txtFiles2/
cp: cannot stat 'txtFiles1': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp -r txtFiles1 txtFiles2/
cp: cannot stat 'txtFiles1': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp txtFiles txtFiles2/
cp: -r not specified; omitting directory 'txtFiles'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp -r txtFiles txtFiles2/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls txtFiles2/*
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp --backup backup1.txt /
cp: cannot stat 'backup1.txt': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mkdir backupDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt txtFiles txtFiles2
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp --backup *.txt /backupDir
cp: target '/backupDir': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cp --backup *.txt backupDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls backupDir/*
backupDir/delete1.txt backupDir/delete2.txt backupDir/delete3.txt backupDir/delete4.txt backupDir/delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano delete1.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat backupDir/delete1.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat delete1.txt
admin abc edit for backup
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █

```

## Mv

Used to move files or rename them too

- Mv file1.txt file2.txt : this will rename file1 as file2, and then file2 will get renamed.
- Mv -i : used for interactive move
- Mv -u : used to move only those that dont exist
- Mv –suffix: used to take backup before overwriting

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt mv moveDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mv -i delete1.txt delete2.txt
mv: overwrite 'delete2.txt'? yes
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
delete2.txt delete3.txt delete4.txt delete5.txt moveDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mkdir backupDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mv --suffix=.bak delete2.txt backupDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls backupDir/
delete2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls moveDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mv delete2.txt moveDir/
mv: cannot stat 'delete2.txt': No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir delete3.txt delete4.txt delete5.txt moveDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mv delete3.txt moveDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mv -u *.txt moveDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls moveDir/
delete3.txt delete4.txt delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir moveDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ touch delete{1..4}.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir delete1.txt delete2.txt delete3.txt delete4.txt moveDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ mv -u *.txt moveDir/
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir moveDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ 

```

## Rename

First of all, lets understand s and y

- a. s/pattern/replacement/
  - i. Substitute
  - ii. used to replace a pattern with a replacement
- b. y/A-Z/a-z/
  - i. Transliteration
  - ii. replaces all occurrences of the characters found in the search list with the corresponding character in the replacement list.

Now, the commands are:

- a. rename -n: This option shows what files would have been renamed.
- b. rename -v: This option shows what renaming operations are being done.
- c. rename 'y/A-Z/a-z' \*.txt : change uppercase to lowercase for names of all txt files.

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ ls
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ rename -n 's/.txt/.bak/' *.txt
rename(delete1.txt, delete1.bak)
rename(delete2.txt, delete2.bak)
rename(delete3.txt, delete3.bak)
rename(delete4.txt, delete4.bak)
rename(delete5.txt, delete5.bak)
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ ls
delete1.txt delete2.txt delete3.txt delete4.txt delete5.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ rename -v 's/.txt/.bak/' *.txt
delete1.txt renamed as delete1.bak
delete2.txt renamed as delete2.bak
delete3.txt renamed as delete3.bak
delete4.txt renamed as delete4.bak
delete5.txt renamed as delete5.bak
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ rename 'y/a-z/A-Z/' *
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ rename -v 's/a-z/A-Z/' *.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ ls
DELETE1.BAK DELETE2.BAK DELETE3.BAK DELETE4.BAK DELETE5.BAK
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ rename -n 'n/A-Z/a-z' *.BAK
Bareword "n" not allowed while "strict subs" in use at line 1.
syntax error at line 1, near "a-z"
Execution of (eval 25) aborted due to compilation errors, in:
n/A-Z/a-z
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ rename -n 's/A-Z/a-z' *.BAK
Substitution replacement not terminated at line 1, in:
s/A-Z/a-z
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/moveDir$ █
```

## Man

to view the system's reference manual.

- Man -a : show all man page sections of particular topic
- Man -aw : list all sections
- Whereis : find location of a manpage
- Whatis: searches for a manual page name, and gives a short description
- Man - k (apropos) : search the man page descriptions for a particular keyword

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ man -aw chmod
/usr/share/man/man1/chmod.1.gz
/usr/share/man/man2/chmod.2.gz
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ whereis chmod
chmod: /usr/bin/chmod /usr/share/man/man2/chmod.2.gz /usr/share/man/man1/chmod.1.gz
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ whatis chmod
chmod (1)          - change file mode bits
chmod (2)          - change permissions of a file
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ 
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ man -k chmod
chmod (1)          - change file mode bits
chmod (2)          - change permissions of a file
fchmod (2)         - change permissions of a file
fchmodat (2)       - change permissions of a file
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ 
```

## File Content

- a. cat fileContent.txt >> test.txt : this will copy contents of first file to another new file
- b. Head filename.txt : displays first 10 lines by default,
  - i. but if we specify n like, head -15 filename.txt, then it will show 15 lines.
  - ii. And if we have head filename.txt filename2.txt, then it will show 10 lines of both by default
- c. Tail will give last lines like head did
  - i. Using -n, will give number of lines to be shown
  - ii. Using -c will show specific number of bytes from last
- d. Cat file1 file2 > comboFile : will concatenate and put result
- e. Cat -n file1 : will show line number in front of each line
- f. Cat -b file1 : wont assign line number to empty lines

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir  errorInfo.txt  fileContent.txt  lsInfo.txt  moveDir  test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat errorInfo.txt lsInfo.txt > comboInfo.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat -n comboInfo.txt
 1  ls: invalid option -- 'j'
 2  Try 'ls --help' for more information.
 3  backupDir
 4  fileContent.txt
 5  lsInfo.txt
 6  moveDir
 7  test.txt
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ head fileContent.txt test.txt
==> fileContent.txt <==
my
name
is
suyan
shrestha
a
s

df
c

==> test.txt <=
my
name
is
suyan
shrestha
a
s

df
c
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ head -2 fileContent.txt
my
name
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ tail -2 fileContent.txt
a

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ tail -c 6 fileContent.txt
c
a
```

- g. Tac : same as cat but displays in reverse order

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir  comboInfo.txt  errorInfo.txt  fileContent.txt  lsInfo.txt  moveDir  test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat errorInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ tac errorInfo.txt
Try 'ls --help' for more information.
ls: invalid option -- 'j'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ 
```

- h. More : cat will scroll off screen if long contents, so use 'more'
  - i. Enter key : line by line scroll
  - ii. Space bar : next page
  - iii. B key : go backward
  - iv. More -num : how many lines to be displayed limit
  - v. More +num : display content from specified line
  - vi. more +/string name : find string
  - vii. More -d : display user msg at corner
  - viii. More -b : squeeze blank line
- i. Less :
  - i. More only allows line by line forward navigation
  - ii. But, allows both forward and backward navigation in the file, making it easier to scroll up and down.

## Filter

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat comboInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat comboInfo.txt | tac
test.txt
moveDir
lsInfo.txt
fileContent.txt
backupDir
Try 'ls --help' for more information.
ls: invalid option -- 'j'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

- a. This pipeline operator is used to take output of one command and use it over another command. Here, cat's output is used as tac input.
- b. cut -d '' -f(columnNumber) <fileName>
  - i. Cut -d- -f1 fileName.txt : - will be delimiter, and first column will be shown
  - ii. Cut -d ' ' -f2 fileName.txt : here space will be delimiter, and second column will be shown. If there is no second column, it will show latest one

- c. Cut -b 2 <fileName> : this will show 2nd byte of each line

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cut -b 2 comboInfo.txt
s
r
a
i
s
o
e
supersuyan@supersuyan:~/Ddrive/Bajra Trainee$
```

```
ls: invalid option -- 'j'
Try 'ls --help' for more information.
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cut -d ' ' -f1 comboInfo.txt
ls:
Try
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cut -d ' ' -f2 comboInfo.txt
invalid
'ls
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

- d. cut -c 1,6 comboInfo.txt : 1st and 6th byte element chahi dekhauni  
e. Cut – complement 1,6 comboInfo.txt : 1st and 6th bahek dekhauni  
f. Cat marks.txt : this will give all result marks

- i. Cat marks.txt | grep 9 : only give result with 9 vako line

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cut -c 1,6 comboInfo.txt
ln
Tl
bp
fo
lo
mi
tt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cut --complement -c 1,6 comboInfo.txt
s: invalid option -- 'j'
try 'man --help' for more information.
ackuDir
ileCnent.txt
sInf.txt
oveDr
est.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

g. Grep

- i. finds a file for a specific character pattern and shows every line that includes that pattern  
Cat name.txt | grep Suyan
- ii. generally used with pipe (|).  
Grep Suyan name.txt
- iii. Not with pipe  
Grep Suyan name.txt
- iv. Find except this character (inverse filter)  
Grep -v Suyan name.txt
- v. Case insensitive filter  
Grep -i SUYAN name.txt
- vi. Grep
  - 1. -A1 Suyan name.txt : means, the line where it finds the word Suyan, get the line with word Suyan and line after that line
  - 2. -A2 Suyan name.txt: get the line with word SUyan and two lines after that line.
  - 3. -B1: line with word Suyan and a line before that line
  - 4. -C1: line with word SUyan, line before that, and line after that.

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat comboInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat comboInfo.txt | grep l
ls: invalid option -- 'j'
Try 'ls --help' for more information.
fileContent.txt
lsInfo.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep l comboInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
fileContent.txt
lsInfo.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -v l comboInfo.txt
backupDir
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -v L comboInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -i L comboInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
fileContent.txt
lsInfo.txt
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt
Alex
Shristi
Suyan
Kriti
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -A1 Suyan name.txt
Suyan
Kriti
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -B1 Suyan name.txt
Shristi
Suyan
Kriti
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -C1 Suyan name.txt
Shristi
Suyan
Kriti
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ grep -A2 Suyan name.txt
Suyan
Kriti
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

- h. Comm file1 file2 : used to compare two files and will give 3 columns
  - i. Column 1 : unmatching of first file
  - ii. Column 2 : unmatching of second file
  - iii. Column 3 : matching of both files
  - iv. But if,
    - 1. Comm -23 : means only show first column
    - 2. Comm -13 : means only show 2nd column
- i. Sed : for replacement
  - i. If at last of path, /g is added, then it means global replacement.
  - ii. cat <fileName> | sed '/<Word>/d' : deletes that word
  - iii. sed -e 's/red/blue/; s/yellow/black/' exm.txt : multiple replacements - but all replacements separated by semicolons, and they are in a single string

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt
Alex
Shristi
Suyan
Kriti
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt | sed 's/Alex/WalexBahadur'
sed: -e expression #1, char 19: unterminated `s' command
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt | sed 's/Alex/WalexBahadur/'
WalexBahadur
Shristi
Suyan
Kriti
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt
Alex
Shristi
Suyan
Kriti
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt | sed 's/Shristi/kojukumari'
sed: -e expression #1, char 20: unterminated `s' command
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt | sed 's/Shristi/kojukumari/g'
Alex
kojukumari
Suyan
Kriti
LoremKnight
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt
Alex
Shristi
Suyan
Kriti
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat name.txt | sed '/Kriti/d'
Alex
Shristi
Suyan
LoremKnight
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sed -e 's/Alex/Ulululu/'; 's/LoremKnight/sutuwa/'
^C
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sed -e 's/Alex/Ulululu/'; 's/LoremKnight/sutuwa/' name.txt
^C
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sed -e 's/Alex/Ulululu/'; 's/LoremKnight/sutuwa/' name.txt
Ulululu
Shristi
Suyan
Kriti
sutuwa
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

# Day2

- j. Tee : quite similar to the 'cat' command, with only one difference..-
- Reads standard input, then write to std output and files simultaneously
  - Suppose cat would just display contents, but in case of tee, it takes input usually by pipe (|), i.e. output of other command as input here, and then writes that input
  - We can use -a to append instead of overwrite
  - echo " add text" | tee file1.txt file2.txt file3.txt : for multiple files writing

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir  comboInfo.txt  errorInfo.txt  fileContent.txt  lsInfo.txt  moveDir  name2.txt  name.txt  test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo 'Suyan'
Suyan
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo 'Suyan' | cat catFile.txt
cat: catFile.txt: No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo 'Suyan' | cat comboInfo.txt
cat: comboInfo.txt: No such file or directory
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo 'Suyan' | tee teeFile.txt
Suyan
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat teeFile.txt
Suyan
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo 'OH noooooooooo overwrite vayooo' | tee teeFile.txt
OH noooooooooo overwrite vayooo
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat teeFile.txt
OH noooooooooo overwrite vayooo
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo 'aba ma append handinxu' | tee -a teeFile.txt
aba ma append handinxu
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat teeFile.txt
OH noooooooooo overwrite vayooo
aba ma append handinxu
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

- k. Tr : translate
- cat trFile.txt | tr '\n' '---' : simply replace \n by -
  - echo "Hello:::World::!" | tr -s ':' : squeeze multiple :::: to one :
  - echo "Hello:::World::!" | tr -d : : delete “”

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat trFile.txt
a for Apple
b for ball
c for cat
d for dalle
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat trFile.txt | tr '\n' '---'
a for Apple---b for ball---c for cat---d for dalle---supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "Hello:::World::!" | tr -s
tr: missing operand
Try 'tr --help' for more information.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "Hello:::World::!" | tr -s 'abc'
Hello:::World::!
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "Hello:::World::!" | tr -s ':'
Hello:World:!
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "Hello:::World::!" | tr -s '::' 'l'
HelloWorld!
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "Hello:::World::!" | tr -s '::' 'l' 'gap'
tr: extra operand 'gap'
Try 'tr --help' for more information.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ echo "Hello:::World::!" | tr -d l
Heo:::Word::!
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ 

```

## I. Uniq : unique elements

- i. | uniq : only show unique elements
- ii. | uniq -s 2 : skip first two characters then start comparing
- iii. | uniq -f 2 : skip first two fields (words), then start comparing
- iv. | uniq -c : count number of occurrences of each
- v. | uniq -d : display only repeated lines

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat uniqTxt2.txt
aaHello
bbHello
ccWorld
ddWorld
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat uniqTxt2.txt | uniq -s 2
aaHello
ccWorld

```

## m. Wc : word count

- i. Wc : gives number of lines, words, and characters
- ii. -l : lines
- iii. -m : bytes
- iv. -c : characters
- v. -w : words
- vi. -L : length of longest line

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat wcTxt.txt
Apple is red.
Banana is yellow.
Grapes are green.
Oranges are orange.
Blueberries are blue.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ wc wcTxt.txt
 5 15 92 wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ wc -l wcTxt.txt
5 wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ wc -c wcTxt.txt
92 wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ wc -m wcTxt.txt
92 wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ wc -w wcTxt.txt
15 wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ wc -L wcTxt.txt
21 wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

n. Sort

- i. Sort -k2 : sort according to second column
- ii. Sort -n -k2 : sort second column, number-wise order

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat sortText.txt
John Doe 28
Jane Smith 32
Alice Johnson 24
Bob Brown 30
Charlie Davis 35
Emily Miller 27
Frank Wilson 33
Grace Taylor 29
Henry Moore 31
Irene Thomas 25
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sort sortText.txt
Alice Johnson 24
Bob Brown 30
Charlie Davis 35
Emily Miller 27
Frank Wilson 33
Grace Taylor 29
Henry Moore 31
Irene Thomas 25
Jane Smith 32
John Doe 28
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sort -k2 sortText.txt
Bob Brown 30
Charlie Davis 35
John Doe 28
Alice Johnson 24
Emily Miller 27
Henry Moore 31
Jane Smith 32
Grace Taylor 29
Irene Thomas 25
Frank Wilson 33
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sort -n -k3 sortText.txt
Alice Johnson 24
Irene Thomas 25
Emily Miller 27
John Doe 28
Grace Taylor 29
Bob Brown 30
Henry Moore 31
Jane Smith 32
Frank Wilson 33
Charlie Davis 35
```

**o. COMPRESS**

- i. Gzip : compress
  - ii. Gunzip : decompress
  - iii. Cat file1 file2 | gzip > final.gz : output of cat will be compressed to new file
  - iv. Tar : to compress folders

p. Locate

- i. Locate is simply used to find files and folders
- ii. -i : case insensitivity
- iii. -n : limit number
- iv. -c : count number of files

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ locate _SUYAN | head -n 2
/home/supersuyan/Ddrive/_SUYAN
/home/supersuyan/Ddrive/_SUYAN/30DAYSCHALLEN
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ locate '*.txt' -n 2
/boot/grub/gfxblacklist.txt
/etc/X11/rgb.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ locate -c '*.txt'
2672
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ locate -i _suyan | head -n 2
/home/supersuyan/.config/google-chrome/Default/IndexedDB/https_suyanshrestha.atla
/home/supersuyan/.config/google-chrome/Default/IndexedDB/https_suyanshrestha.atla
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ locate -S
locate: invalid option -- 'S'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

q. Find

- i. find <location> <comparison-criteria> <search-term>
  - 1. dot(.) for current directory
  - 2. Slash (/) for root directory
- ii. find . -name "\*.txt"
- iii. find . -type d -name "\*Dir"
  - 1. D : directory
  - 2. F : file
  - 3. L : symbolic links
  - 4. C : character device
  - 5. B : block device
- iv. find . -newer msg.txt : newer files and folders than mentioned file msg.txt
- v. find . -name Demo.txt -delete : find and delete
- vi. find / -mtime -1 : modification time less than a day

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find . -name "*.txt" | head -n 2
./sortText.txt
./wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir  final  final.gz  -l  moveDir  sortText.txt  tarDir  wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find . -type d -name "*Dir"
./moveDir
./backupDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find . -type d f -newer wcTxt.txt
find: paths must precede expression: `f'
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find . -type d -newer wcTxt.txt
.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find . -newer wcTxt.txt
.
./sortText.txt
./-l
./final
./final.gz
./tarDir
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find . -name sortText.txt -delete
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir  final  final.gz  -l  moveDir  tarDir  wcTxt.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ find / -mtime -1
/usr/sbin
/usr/share
/usr/share/quota
/usr/share/quota/ldap
/usr/share/perl5/File
/usr/share/perl5/File/Rename
/usr/share/man/man3
/usr/share/man/man8
/usr/share/man/man5
/usr/share/man/man1
^C
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

## Linux Networking

- a. Ifconfig : initialize an interface, assign IP address, enable or disable an interface. It display route and network interface.

## Ping

- a. Ping -c 2 javatpoint.com : limits number of packets
- b. Ping 2.2.2.2 : ping an ip
- c. Ping -4 javatpoint.com : check ipv4 connectivity
- d. Ping -6 javatpoint.com : check ipv6 connectivity

- e. ping -i 1.5 www.javatpoint.com : each 1.5second , packet send

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ping -c 2 javatpoint.com
PING javatpoint.com (172.67.207.221) 56(84) bytes of data.
64 bytes from 172.67.207.221: icmp_seq=1 ttl=55 time=36.4 ms
64 bytes from 172.67.207.221: icmp_seq=2 ttl=55 time=38.8 ms

--- javatpoint.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1000ms
rtt min/avg/max/mdev = 36.428/37.592/38.757/1.164 ms
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ping -c 2 -4 javatpoint.com
PING javatpoint.com (104.21.22.242) 56(84) bytes of data.
64 bytes from 104.21.22.242: icmp_seq=1 ttl=55 time=35.2 ms
64 bytes from 104.21.22.242: icmp_seq=2 ttl=55 time=37.1 ms

--- javatpoint.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 35.246/36.178/37.111/0.932 ms
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ping -c 2 -6 javatpoint.com
ping: connect: Network is unreachable
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ping -c 2 -D javatpoint.com
PING javatpoint.com (104.21.22.242) 56(84) bytes of data.
[1717566523.302721] 64 bytes from 104.21.22.242: icmp_seq=1 ttl=55 time=34.4 ms
[1717566524.303233] 64 bytes from 104.21.22.242: icmp_seq=2 ttl=55 time=37.3 ms

--- javatpoint.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 34.437/35.867/37.298/1.430 ms
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ping -i 1.5 www.javatpoint.com -c 2
PING www.javatpoint.com (172.67.207.221) 56(84) bytes of data.
64 bytes from 172.67.207.221: icmp_seq=1 ttl=55 time=35.8 ms
64 bytes from 172.67.207.221: icmp_seq=2 ttl=55 time=36.9 ms

--- www.javatpoint.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1502ms
rtt min/avg/max/mdev = 35.788/36.353/36.919/0.565 ms
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

## Netstat

- a. Netstat -a : display all connections
- b. Netstat -at : only display tcp connections
- c. Netstat -au : only display udp connections
- d. netstat -tnl : only display listening connections

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ netstat -tnl | head -n 6
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 127.0.0.53:53           0.0.0.0:*
tcp      0      0 127.0.0.54:53           0.0.0.0:*
tcp      0      0 127.0.0.1:3306          0.0.0.0:*
tcp      0      0 127.0.0.1:631           0.0.0.0:*
```

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ netstat -at | head
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 _localdnsstub:domain    0.0.0.0:*
tcp      0      0 _localdnsproxy:domain   0.0.0.0:*
tcp      0      0 localhost:mysql         0.0.0.0:*
tcp      0      0 localhost:ipp          0.0.0.0:*
tcp      0      0 localhost:33060        0.0.0.0:*
tcp      0      0 supersuyan:48348       edge-star-shv-02-:https ESTABLISHED
tcp      0      0 supersuyan:42648       edge-dgw-shv-02-d:https ESTABLISHED
tcp      0      0 supersuyan:34924       ns1022841.ip-15-2:https ESTABLISHED
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ netstat -au | head
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
udp      0      0 supersuyan:56142       del12s01-in-f14.1:https ESTABLISHED
udp      0      0 supersuyan:60479       del11s18-in-f10.1:https ESTABLISHED
udp      0      0 supersuyan:52330       del11s09-in-f14.1:https ESTABLISHED
udp      0      0 supersuyan:56980       del12s06-in-f3.1e:https ESTABLISHED
udp      0      0 supersuyan:45006       19.229.41.124.dyn:https ESTABLISHED
udp      0      0 _localdnsproxy:domain  0.0.0.0:*
udp      0      0 _localdnsstub:domain   0.0.0.0:*
udp      0      0 supersuyan:bootpc     _gateway:bootps           ESTABLISHED
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █

```

## Curl and wget

To download a file from the internet using CLI.

- curl -O <fileLink>
- Wget <fileLink>

## Users

### User basics

- whoami : system username
- Who : users logged in
- W : users who are logged in and what are they doing.
- Who am i : current user only
- id : userid , groupid and list of groups belonging to

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ whoami
supersuyan
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ who
supersuyan  tty2          2024-06-05 09:20 (:0)
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ who am i
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ w
12:02:53 up 2:43, 1 user, load average: 0.94, 1.34, 1.16
USER      TTY      FROM             LOGIN@    IDLE    JCPU   PCPU WHAT
supersuyan  tty2          -          09:20    2:43m  6:32   0.12s /usr/lib/x86_64-li
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ id
uid=1000(supersuyan) gid=1000(supersuyan) groups=1000(supersuyan),4(adm),24(cdrom)
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

## Su

- a. Su : run shell as other user
- b. su root : run as root
- c. Sudo : start programs with the credentials of another user.
- d. sudo /usr/sbin/useradd -m Suyan : creates a new user Suyan
- e. Sudo su : a user can become root user without typing password for root.

## User management

- a. Useradd : add user
- b. Users : to see all users
- c. Userdel : delete existing user
- d. Usermod : modify properties of user
- e. Userdel -r <userName> : to delete home directory of that user

## Passwd

- a. passwd <userName> : to change password
- b. To create a user with a password -p option is also used, but that requires an encrypted password.
- c. chage -l supersuyan : password information
- d. usermod -L supersuyan : disable password
- e. Usermod -U supersuyan : unlock account

## Groups

- a. Groupadd <groupname> : adds group in system
- b. Groups : group where current user belongs to.
- c. /etc/group : group membership file
- d. groupmod -n <oldGroup> <newGroup> : change name of existing group

- e. usermod -a -G <group> <userName> : edit group members, -a will append
- f. groupdel <group> : delete group permanently from system
- g. gpsswd -A <user> <group> : pass control of group membership to other user
- h. Tail -3 /etc/group : list latest 3 groups

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupadd group1
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupadd group2
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupadd group3
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ groups
supersuyan adm cdrom sudo dip plugdev users lpadmin sambashare
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ /etc/group
bash: /etc/group: Permission denied
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo /etc/group
sudo: /etc/group: command not found
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupmod -n group1 groupa
groupmod: group 'groupa' does not exist
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupmod -n groupa group1
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ tail -3 /etc/group
group2:x:1003:
group3:x:1004:
groupa:x:1002:
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ groupdel group2
groupdel: Permission denied.
groupdel: cannot lock /etc/group; try again later.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupdel group2
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupdel group3
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ sudo groupdel groupa
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ tail -3 /etc/group
mongodb:x:115:mongodb
mysql:x:132:
suyanhero:x:1001:
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █

```

## System Admin Command

### kill

- a. Ps -A : list all processes
- b. ps -A | grep chrome | head -n 6
- c. Kill -l : shows options of signal
- d. Kill -9 5077 : kill process with pid 5077
- e. Killall -9 chrome : kill all processes with name=chrome
- f. Pkill : uses name instead of pid. Also works on both full name or partial ones.
- g. Xkill : select window you wish to kill
- h. Xclients : list all clients

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -A | grep chrome | head -n 10
 5027 ?      00:00:58 chrome
 5035 ?      00:00:00 chrome_crashpad
 5037 ?      00:00:00 chrome_crashpad
 5043 ?      00:00:00 chrome
 5044 ?      00:00:00 chrome
 5046 ?      00:00:00 chrome
 5075 ?      00:00:41 chrome
 5077 ?      00:00:14 chrome
 5080 ?      00:00:00 chrome
 5150 ?      00:00:01 chrome
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ kill -l
 1) SIGHUP      2) SIGINT      3) SIGQUIT      4) SIGILL      5) SIGTRAP
 6) SIGABRT     7) SIGBUS      8) SIGFPE       9) SIGKILL     10) SIGUSR1
11) SIGSEGV     12) SIGUSR2     13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGSTKFLT   17) SIGCHLD     18) SIGCONT     19) SIGSTOP     20) SIGTSTP
21) SIGTTIN     22) SIGTTOU     23) SIGURG      24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM   27) SIGPROF     28) SIGWINCH    29) SIGIO       30) SIGPWR
31) SIGSYS      34) SIGRTMIN    35) SIGRTMIN+1  36) SIGRTMIN+2  37) SIGRTMIN+3
38) SIGRTMIN+4  39) SIGRTMIN+5  40) SIGRTMIN+6  41) SIGRTMIN+7  42) SIGRTMIN+8
43) SIGRTMIN+9  44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6  59) SIGRTMAX-5  60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1  64) SIGRTMAX
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ kill -9 5077
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ killall -9 chrome

```

```

supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ pkill -2 chr
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ xkill
Select the window whose client you wish to kill with button 1....
xkill: killing creator of resource 0x480000c
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ xlsclients
supersuyan  xdg-desktop-portal-gtk
supersuyan  google-chrome-stable

```

## Wget

- Wget <url> : download a file
- Wget -O <fileName> <URL> : Store with a different file name
- Wget -c <URL> : complete remaining downloaded file
- Wget -b <URL> : download in background
- wget --tries=<Number> <URL> : set retrying attempts
- wget -i <fileName> : multiple files download
- wget --reject=<rejectingFile> <URL> : reject a type of file
- wget -Q<Value>m -i <fileName> : Quit downloading on exceeding certain limit

## Ps

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -ef | head -n 3
UID          PID      PPID   C STIME TTY          TIME CMD
root          1        0  0 13:30 ?        00:00:01 /sbin/init splash
root          2        0  0 13:30 ?        00:00:00 [kthreadd]
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -aux | head -n 3
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START  TIME COMMAND
root          1  0.0  0.1  22848 13820 ?        Ss   13:30  0:01 /sbin/init
splash
root          2  0.0  0.0      0     0 ?        S    13:30  0:00 [kthreadd]
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -A | grep chrome | head -n 3
 8145 ?        00:02:42 chrome
 8153 ?        00:00:00 chrome_crashpad
 8155 ?        00:00:00 chrome_crashpad
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ process -p 8153
process: command not found
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -p 8153
  PID TTY      TIME CMD
 8153 ?        00:00:00 chrome_crashpad
```

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ pstree | head -n 10
systemd--ModemManager---3*[{ModemManager}]
|---NetworkManager---3*[{NetworkManager}]
|---accounts-daemon---3*[{accounts-daemon}]
|---avahi-daemon---avahi-daemon
|---bluetoothd
|---cron
|---cups-browsed---3*[{cups-browsed}]
|---cupsd
|---dbus-daemon
|---fwupd---5*[{fwupd}]
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -u supersuyan | head -n 5
  PID TTY      TIME CMD
 1358 ?        00:00:00 systemd
 1359 ?        00:00:00 (sd-pam)
 1367 ?        00:00:05 pipewire
 1368 ?        00:00:00 pipewire
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -C chrome | head -n 4
  PID TTY      TIME CMD
 8145 ?        00:02:46 chrome
 8161 ?        00:00:00 chrome
 8162 ?        00:00:00 chrome
```

- Ps -ef / -aux : full format for current running process
- ps -u <username> : process for that username
- ps -C <command> : process for given command
- Pstree : process hierarchy
- Ps -f -p 1358,8145,8162 : list those processes (dont keep spaces in between as they will be counted as pid too)

```
8162 1 8162 1 0:00 chrome
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -f -p 1358, 8145, 8162
error: improper list

Usage:
ps [options]

Try 'ps --help <simple|list|output|threads|misc|all>'
or 'ps --help <s|l|o|t|m|a>'
for additional help text.

For more details see ps(1).
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ps -f -p 1358,8145,8162
UID          PID      PPID   C STIME TTY          TIME CMD
supersu+    1358          1   0 13:31 ?        00:00:00 /usr/lib/systemd/systemd
supersu+    8145        1685  10 14:08 ?        00:02:53 /opt/google/chrome/chrome
supersu+    8162        8145   0 14:08 ?        00:00:00 /opt/google/chrome/chrome
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$
```

## Linux File Security

### File Ownership

- a. chgrp <newGroup> <fileName> : change group for a file
- b. chown <newOwner> <fileName> : change owner/user for a file

### Permissions

- a. There are three types of permissions
  - i. r : read : open and read the content of a file.
  - ii. W : write : edit, remove or rename a file.
  - iii. X : execute : run or execute a program
- b. Positioning of 10 characters
  - i. 1st char : type of file (d for directory, and - for regular file like .txt)
  - ii. 2nd - 4th char : permission for user
  - iii. 5th - 7th char : permission for group
  - iv. 8th -10th char : permission for other
  - v. Here for permission part,
    - 1. Rwx means it is allowed to read, write and execute
    - 2. R-x means it is allowed to read and execute but not write
    - 3. Similarly RW- means it is allowed to read and write but not execute.
- c. Change permissions
  - i. chmod <groupName>+<permissionName> <fileName>
    - 1. Chmod u+x file
    - 2. Add permissions

- ii. chmod <groupName>-<permissionName> <fileName>
  - 1. Chmod u-x file
  - 2. Remove permissions
- iii. chmod +<permissionName> <fileName>
  - 1. Chmod +w file
  - 2. Change permissions to all groups
- d. chmod <groupName>=<permissions> <fileName>
  - i. Sets explicit permissions, without just adding or removing permissions
  - ii. Chmod u=rw
  - iii. chmod u=rwx,g=rw,o=r file
- e. Octal permissions
  - i. There are 3 permissions, so 3 digit binary number
  - ii. In binary format, if 0, then permission is not granted. But, if its 1, then permission respectively for r(Most Significant bit), w (middle bit) or x(least significant bit is granted)

binary	octal	permissions
000	0	---
001	1	--x
010	2	-w-
011	3	-wx
100	4	r--
101	5	r-x
110	6	rwx
111	7	rwx

777 = rwxrwxrwx

765 = rwxrw-r-x

654 = rw-r-xr--

- f. mkdir -m 777 new1 : make dir with permissions
- g. Umask
  - i. set default permissions for files or directories the user creates.
  - ii. Umask : 0002 will be output, where first 0 means sticky bit, then remaining three bits is octal bits of umask
  - iii. Umask values are just values which are subtracted from the maximum permission for files/directories.
  - iv. the umask command can be only used on new files i.e. while creating new files. But, chmod command must be used on files that are already present.

- v. When we make a new directory, the permissions will be calculated as (full permissions for directory) – (umask value) i.e.  $777 - 543 = 234$

## Linux advanced permissions

- a. Sticky bit
  - i. chmod +t /path/to/directory
  - ii. permission bit that protects the files within a directory
  - iii. a file can be deleted only by the owner of the file, the owner of the directory, or by a privileged user.
- b. Setuid
  - i. chmod u+s /path/to/file
  - ii. permission that allows users to execute a file with the permissions of the file owner.
- c. Setgid
  - i. chmod g+s /path/to/file
  - ii. permission that allows users to execute a file with the permissions of the file group owner.

## Inodes

- a. uniquely existing number for all the files in Linux
- b. When a file is created on a system, a file name and Inode number is assigned to it.
- c. data structure containing metadata about the files.
- d. Inode table contains all the Inodes : created when file system is created

## Hard Links

- a. Created using “ln” command
- b. A Hard link acts as a copy (mirrored) of the selected file.
- c. If the earlier selected file is deleted, the hard link to the file will still contain the data of that file.
- d. But, if there are added new stuff in target, then the changes are visible in hardlink too.  
Just deleting the target wont affect hardlink.
- e. Faster speed
- f. efficient use of disc space by avoiding the unnecessary creation of record blocks.

```
[ Error writing target.txt: Permission denied ]
Write Out ^W Where Is ^K Cut ^T Execute
Read File ^R Replace ^U Paste ^J Justify
```

Here, I chmod 555 , revoking right to write for hardlink, then I couldn't nano my target file too. So, changing permissions for hardlink will change permissions of target file too.

## Soft Links

- a. Created using “ln -s” command
- b. Symbolic links
- c. Can link directories.

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
-l target.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ln target.txt hardlink.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat hardlink.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano target.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat hardlink.txt
abc
abc
abc
dhajdan
dk
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ chmod 555 hardlink.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano target.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano target2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ln -s softlink.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat softlink.txt
cat: softlink.txt: Too many levels of symbolic links
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ln -s target2.txt softlink.txt
ln: failed to create symbolic link 'softlink.txt': File exists
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ln -s target2.txt softlink2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat softlink2.txt
amaxm
xmak
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ chmod 555 softlink2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ nano target2.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

Same as with hardlink, Here, I chmod 555 , revoking right to write for hardlink, then I couldn't nano my target file too. So, changing permissions for softlink will change perimssions of target file too.

## Shell Script

# EXTRA LEARNINGS

- a. Cat Test1.txt >> test2.txt will simply append contents of test1.txt to test2.txt
- b. Cat Test1.txt > test2.txt will overwrite contents of test2.txt by contents of test1.txt
- c. 2> can be used to save errors in separate files
- d. >> can be used to save output of commands in a text file

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls
backupDir  fileContent.txt  moveDir  test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls >> lsInfo.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat lsInfo.txt
backupDir
fileContent.txt
lsInfo.txt
moveDir
test.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ ls -adknsjn 2> errorInfo.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ cat errorInfo.txt
ls: invalid option -- 'j'
Try 'ls --help' for more information.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ █
```

- e. Touch filename{1..10}.txt will create 10 files at once

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/test$ ls
a.txt b.txt hello.txt test1 test2
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/test$ touch delete{1..10}.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/test$ ls
a.txt b.txt delete10.txt delete1.txt delete2.txt delete3.txt delete4.txt dele
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee/test$ █
```

- f. Dont know why, but symlinks could only be created on same directory. If the target and symlink arent on same directory, symlink wont point normally.
- g. History : to see command history
- h. Ctrl + Shift + C : view word count in google docs
- i. Miscellaneous

```
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ whoami
supersuyan
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ finger supersuyan
Login: supersuyan          Name: supersuyan
Directory: /home/supersuyan      Shell: /bin/bash
On since Tue Jun  4 22:01 (+0545) on tty2 from :0
  1 hour 7 minutes idle
No mail.
No Plan.
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ last -1 supersuyan
supersuy tty2      :0           Tue Jun  4 22:01  still logged in

wtmp begins Thu May 23 15:37:16 2024
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ du name.txt
4      name.txt
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ date
मंगलवा र 04 जून 2024 11:09:05 अमरा हन +0545
supersuyan@supersuyan:~/Ddrive/Bajra_Trainee$ last supersuyan
supersuy tty2      :0           Tue Jun  4 22:01  still logged in
supersuy tty2      :0           Tue Jun  4 20:32 - down  (00:18)
supersuy tty2      :0           Tue Jun  4 20:29 - down  (00:02)
supersuy tty2      :0           Tue Jun  4 13:11 - down  (04:46)
supersuy tty2      :0           Tue Jun  4 10:13 - down  (02:24)
supersuy tty2      :0           Tue Jun  4 09:46 - down  (00:06)
supersuy tty2      :0           Tue Jun  4 06:12 - down  (01:44)
supersuy tty2      :0           Mon Jun  3 21:11 - down  (02:32)
```

