

## Experiment 2: Practice some basic commands on Linux

### Basic Navigation Commands:

1. **ls(list)**: Displays the content of a directory.
2. **cd(change directory)**: used to move between directories
3. **Pwd (print working directory)**: Shows the current directory.
4. **mkdir (make directory)**: Creates new directories.
5. **rmdir (remove directory)**: Removes empty directories.

```
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  snap
ubuntu@ubuntu:~$ cd Desktop
ubuntu@ubuntu:~/Desktop$ cd /home/ubuntu/Documents
ubuntu@ubuntu:~/Documents$ pwd
/home/ubuntu/Documents
ubuntu@ubuntu:~/Documents$ cd ..
ubuntu@ubuntu:~$ mkdir newdirectory
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  newdirectory  snap
ubuntu@ubuntu:~$ rmir newdirectory
Command 'rmir' not found, did you mean:
  command 'rmic' from deb openjdk-11-jdk-headless (11.0.26+4-1ubuntu1~24.04)
  command 'rmic' from deb openjdk-8-jdk-headless (8u442-b06~us1-0ubuntu1~24.04)
  command 'rmid' from deb openjdk-11-jre-headless (11.0.26+4-1ubuntu1~24.04)
  command 'rmid' from deb openjdk-8-jre-headless (8u442-b06~us1-0ubuntu1~24.04)
  command 'rmdir' from deb coreutils (9.4-2ubuntu2)
Try: sudo apt install <deb name>
ubuntu@ubuntu:~$ rmdir newdirectory
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  snap
```

1. **ls** – Lists all files and directories in the current directory.  
Useful for checking what's inside a folder.
2. **cd** – Changes the current working directory.  
Lets you move into different folders.
3. **pwd** – Prints the full path of the current working directory.  
Helps you know exactly where you are in the file system.
4. **mkdir** – Creates a new directory with the given name.  
Used to organize files into folders.
5. **rmdir** – Removes an empty directory.  
Cannot delete a directory if it has files inside.

## File Operations

1. **touch**: Creates new files.
2. **cp (copy)**: Copies files and directories
3. **mv (move)**: Moves or renames files and directories.
4. **rm (remove)**: Delete files and directories.

```
ubuntu@ubuntu:~$ touch newfile
ubuntu@ubuntu:~$ cp newfile Desktop
ubuntu@ubuntu:~$ mkdir adi
ubuntu@ubuntu:~$ cp adi Desktop
cp: -r not specified; omitting directory 'adi'
ubuntu@ubuntu:~$ cp -r adi Desktop
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  adi  newfile  snap
ubuntu@ubuntu:~$ mv newfile adi
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  adi  snap
ubuntu@ubuntu:~$ touch newfile1
ubuntu@ubuntu:~$ mv newfile1 newfile2
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  adi  newfile2  snap
ubuntu@ubuntu:~$ rm newfile2
ubuntu@ubuntu:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  adi  snap
ubuntu@ubuntu:~$
```

1. **touch** – Creates a new empty file or updates the timestamp of an existing one.  
Handy for quickly making new files.
2. **cp** – Copies files or directories from one location to another.  
Keeps the original file intact.
3. **mv** – Moves files or directories to a new location, or renames them.  
Useful for organizing and renaming files.
4. **rm** – Deletes files and directories permanently.  
Use with caution, as deleted files can't be recovered.

## File Viewing and Editing

1. **cat**: Displays file contents.
2. **less or more**: View files with pagination.
3. **head and tail**: Shows the beginning or end of a file
4. **nano or vim**: Basic text editors.

```
ubuntu@ubuntu:~$ touch newfile
ubuntu@ubuntu:~$ nano newfile
ubuntu@ubuntu:~$ cat newfile
hi i am aditya rawat
i am 18 years old
i am studying at upes
ubuntu@ubuntu:~$ nano newfile
ubuntu@ubuntu:~$ less newfile
ubuntu@ubuntu:~$ more newfile
hi i am aditya rawat
i am 18 years old
i am studying at upes
1
2
3
4
5
6
7
8

ubuntu@ubuntu:~$ head -n 3 newfile
hi i am aditya rawat
i am 18 years old
i am studying at upes
ubuntu@ubuntu:~$ tail -n 4 newfile
6
7
8
```

1. **cat** – Displays the entire contents of a file on the terminal.  
Good for quickly viewing small files.
2. **less / more** – Opens files one screen at a time with navigation.  
Useful for reading large files without scrolling endlessly.
3. **head / tail** – Shows the first or last few lines of a file.  
Helpful for previewing logs or large files.
4. **nano / vim** – Command-line text editors for creating or editing files.  
Nano is beginner-friendly, while Vim is more advanced.

## User Management

1. **whoami**: Displays the current user.
2. **who**: Show users currently logged in.
3. **passwd**: Change the password for the current user.
4. **sudo (superuser do)**: Execute commands with administrative privileges.

```
ubuntu@ubuntu:~$ whoami
ubuntu
ubuntu@ubuntu:~$ who
ubuntu    seat0          2025-08-27 17:39 (login screen)
ubuntu    :0              2025-08-27 17:39 (:0)
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ passwd
New password:
Retype new password:
passwd: password updated successfully
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ sudo su
root@ubuntu:/home/ubuntu# uname -a
Linux ubuntu 6.14.0-27-generic #27~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 17:38:49 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
root@ubuntu:/home/ubuntu# df
Filesystem      1K-blocks    Used Available Use% Mounted on
tmpfs           400988      1836    399152   1% /run
/dev/sr0        6197156 6197156     0 100% /cdrom
/cow            2004936 294696   1710240  15% /
tmpfs           2004936      8    2004928   1% /dev/shm
tmpfs           5120        8      5112   1% /run/lock
tmpfs           2004936      0    2004936   0% /tmp
tmpfs           400984      160    400824   1% /run/user/1000
```

1. **whoami** – Displays the username of the current logged-in user.  
Useful to confirm which account you're using.
2. **who** – Shows all users currently logged into the system.  
Helpful for monitoring multi-user environments.
3. **passwd** – Changes the password of the current user.  
Can also be used by admins to reset others' passwords.
4. **sudo** – Executes commands with administrative (root) privileges.  
Required for system-level tasks like installing software.

## System Information

1. **uname**: Display system information.
2. **df (disk free)**: Show disk space usage.
3. **top** or **htop**: Monitor system processes.
4. **history**: View command history.

```
ubuntu@ubuntu:~$ sudo su
root@ubuntu:/home/ubuntu# uname -a
Linux ubuntu 6.14.0-27-generic #27~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Tue Jul 22 17:38:49 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
root@ubuntu:/home/ubuntu# df
Filesystem      1K-blocks    Used Available Use% Mounted on
tmpfs            400988      1836    399152   1% /run
/dev/sr0         6197156 6197156      0 100% /cdrom
/cow             2004936 294696    1710240  15% /
tmpfs            2004936      8    2004928   1% /dev/shm
tmpfs            5120        8     5112   1% /run/lock
tmpfs            2004936      0    2004936   0% /tmp
tmpfs            400984      160    400824   1% /run/user/1000
```

```
root@ubuntu:/home/ubuntu# top

top - 06:20:17 up 42 min, 1 user, load average: 0.12, 0.06, 0.13
Tasks: 248 total, 1 running, 247 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.1 us, 0.1 sy, 0.0 ni, 99.8 id, 0.1 wa, 0.0 hi, 0.0 si, 0.0 st
Mem Mem : 3915.9 total, 254.1 free, 1881.1 used, 2356.2 buff/cache
Mem Swap: 0.0 total, 0.0 free, 0.0 used, 2034.8 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR   S  %CPU  %MEM     TIME+ COMMAND
 2530 ubuntu    20   0 4968788 449868 166996 S   1.1  11.2   2:21.66 gnome-shell
 2200 ubuntu    20   0 945712 164876 102408 S   0.5   4.1   4:23.14 Xorg
    1 root       20   0 23564 14636  9772 S   0.0   0.4   0:05.56 systemd
    2 root       20   0      0      0      0 S   0.0   0.0   0:00.03 kthreadd
    3 root       20   0      0      0      0 S   0.0   0.0   0:00.00 pool_workqueue_release
    4 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-rcu_gp
    5 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-sync_wq
    6 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-kvfree_rcu_reclaim
    7 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-slub_flushwq
    8 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-netns
   11 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
   12 root      20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/u16:0-ipv6_addrconf
   13 root      -20   0      0      0      0 I   0.0   0.0   0:00.00 kworker/R-nm_percpu_wq
```

```
root@ubuntu:/home/ubuntu# history

 1  uname -a
 2  df
 3  htop
 4  top
 5  history
```

1. **uname** – Displays system information such as OS name, kernel, and version.  
Useful for checking system details.
2. **df** – Shows disk space usage of file systems.  
Helps monitor available and used storage.
3. **top / htop** – Displays running processes and system resource usage in real-time.  
**htop** is more user-friendly with interactive features.
4. **history** – Shows the list of previously executed commands.  
Makes it easy to repeat or review past commands.