

Experiment [2] : [Basic Commands]

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AIM:

- [To Learn Basic commands in linux.]

Requirements:

- [Any Linux Distro, any kind of text editor (vs code, vim,nano, etc)]

Theory:

BASIC NAVIGATION COMMANDS

- ls (List) : It displays the contents of a directory . When executed without any arguments, it displays the files and subdirectories within the current directory.The function can be modified using various flag options to control the output format and information displayed .

- 1). ls -l : provides “long listing” showing detailed information such as file permissions , number of links , owner and group, size and modification time .
- 2). ls -a : displays all files including hidden files .
- 3). ls -h : it is used with -l , displays the file sizes in a human readable form .
- 4). ls -r : contents of subdirectories is listed recursively .
- 5). ls –colour : displays a coloured output

```
prapti-uniyal@shiven-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
prapti-uniyal@shiven-VirtualBox:~$ ls -l
total 32
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Desktop
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Documents
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Downloads
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Music
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Pictures
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Public
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Templates
drwxr-xr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 20 11:35 Videos
prapti-uniyal@shiven-VirtualBox:~$ ls -s
total 32
4 Desktop    4 Downloads   4 Pictures   4 Templates
4 Documents   4 Music      4 Public     4 Videos
prapti-uniyal@shiven-VirtualBox:~$
```

- cd (change directory) : Helps us in moving from one directory to another.

cd.. : moves up to the parent directory

cd : cd without arguments runs to the user's home directory

cd- : returns to the previously accessed directory

```
prapti-uniyal@shiven-VirtualBox:~$ mkdir Prapti
prapti-uniyal@shiven-VirtualBox:~$ cd Prapti
prapti-uniyal@shiven-VirtualBox:~/Prapti$
```

- pwd(print working directory) : It is used to display the full, absolute path of the current directory where the user is located within the file program.

```
prapti-uniyal@shiven-VirtualBox:~/Prapti$ pwd
/home/prapti-uniyal/Prapti
```

- mkdir(make directory) : It is used to make the directory

syntax : mkdir file_name

```
prapti-uniyal@shiven-VirtualBox:~$ mkdir Linuxlab
```

- rmdir (remove directory) : It is used to delete a directory

syntax : rmdir file_name

```
prapti-uniyal@shiven-VirtualBox:~$ mkdir Linuxlab
prapti-uniyal@shiven-VirtualBox:~$ rmdir Prapti
prapti-uniyal@shiven-VirtualBox:~$ ls
Desktop    Downloads  Music    Public    Videos
Documents  Linuxlab  Pictures  Templates
prapti-uniyal@shiven-VirtualBox:~$
```

File Operations :

- 1). touch
- 2). cp (copy)
- 3). mv (move)
- 4). rm (remove)

- touch : It help us to create a new file

syntax : touch new_file_name.

```
prapti-uniyal@shiven-VirtualBox:~$ touch Exp2.txt
prapti-uniyal@shiven-VirtualBox:~$ touch Experiment2.txt
prapti-uniyal@shiven-VirtualBox:~$ nano Exp2.txt
prapti-uniyal@shiven-VirtualBox:~$ cp Exp2.txt Experiment2.txt
```

- cp (copy) : The cp command is used to copy files and directories .

syntax : cp source_file destination_file



- mv (move) : It relocates the file or directory form a source location to a destination within the file system.

```
prapti-uniyal@shiven-VirtualBox:~$ cp Exp2.txt Experiment2.txt
prapti-uniyal@shiven-VirtualBox:~$ mv Experiment2.txt Linuxlab
prapti-uniyal@shiven-VirtualBox:~$
```

File Edit View Go Bookmarks Help

< > ^ < prapti-uniyal Linuxlab >

▼ My Computer

- Home
- Desktop
- Documents
- Music
- Pictures
- Videos
- Downloads
- Recent
- File System
- Trash

▼ Network

- Network



Experiment2.txt

- rm (remove) : It removes the files and directories from the file system .

```
prapti-uniyal@shiven-VirtualBox:~$ ls
Desktop    Downloads  Linuxlab  Pictures  Templates
Documents  Exp2.txt  Music     Public    Videos
prapti-uniyal@shiven-VirtualBox:~$ rm Exp2.txt
prapti-uniyal@shiven-VirtualBox:~$ ls
Desktop    Downloads  Music     Public    Videos
Documents  Linuxlab  Pictures  Templates
prapti-uniyal@shiven-VirtualBox:~$
```

File viewing and editing :

- 1). cat
- 2). less or more
- 3). head and tail
- 4). nano or vim

- cat (concatenate) : Its main functions are to display contents of one or more files directly to the standard output. It is used to combine the contents of multiple files into a single output stream.

```
prapti-uniyal@shiven-VirtualBox:~/Linuxlab$ cat Experiment2.txt
HI. This is the first time I am using Linux . I hpe I dont mess around .

My name is Prapti UNiyal and I am studying in UPES dehradun
```

- less or more : The less and more commands are both used to view the contents of the text files . The ‘ more’ command displays the content page by page , allowing us to move forward only . The ‘less’ command is the enhanced version of ‘more’ command . ‘less’ command allows us to move forward and backward allowing us to navigate throughout the entire file .

```
prapti-uniyal@shiven-VirtualBox:~/Linuxlab$ more Experiment2.txt
HI. This is the first time I am using Linux . I hpe I dont mess around .

My name is Prapti UNiyal and I am studying in UPES dehradun

prapti-uniyal@shiven-VirtualBox:~/Linuxlab$
```

```
prapti-uniyal@shiven-VirtualBox:~/Linuxlab$ less Experiment2.txt
prapti-uniyal@shiven-VirtualBox:~/Linuxlab$
```

- head and tail : The head and tail command are command-line utilities used to display specific portions of a file .

```
prapti-uniyal@shiven-VirtualBox:~/Linuxlab$ head Experiment2.txt
HI. This is the first time I am using Linux . I hpe I dont mess around .

My name is Prapti UNiyal and I am studying in UPES dehradun

prapti-uniyal@shiven-VirtualBox:~/Linuxlab$
```

```
prapti-uniyal@shiven-VirtualBox:~/Linuxlab$ tail Experiment2.txt
HI. This is the first time I am using Linux . I hpe I dont mess around .

My name is Prapti UNiyal and I am studying in UPES dehradun

prapti-uniyal@shiven-VirtualBox:~/Linuxlab$
```

- nano or vim : These both are command- line text editor . They help us creating and editing the text files within the terminal.

```
prapti-uniyal@shiven-VirtualBox:~$ nano check.sh
prapti-uniyal@shiven-VirtualBox:~$
```

```
GNU nano 7.2
echo "Hello world "
```

User Management :

- 1 whoami
- 2 who
- 3 passwd
- 4 sudo (superuser do)

- whoami : The ‘whoami’ command is used to display the username of the current effective user ID.

```
prapti-uniyal@shiven-VirtualBox:~$ nano check.sh
prapti-uniyal@shiven-VirtualBox:~$ 
```

- who : It is used to display the information about users who are currently logged into the system.

```
prapti-uniyal@shiven-VirtualBox:~$ who
prapti-uniyal  tty7          2025-09-23 11:18 (:0) 
```

- passwd : This command is used in Linux to change the password.

```
prapti-uniyal@shiven-VirtualBox:~$ passwd
Changing password for prapti-uniyal.
Current password:
New password:
Retype new password:
The password has not been changed.
New password:
```

- sudo(superuser do) : It allows the user to execute the commands as other user , typically superuser (root).

```
prapti-uniyal@shiven-VirtualBox:~$ sudo apt install vim
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
vim is already the newest version (2:9.1.0016-1ubuntu7.9).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
prapti-uniyal@shiven-VirtualBox:~$ █
```

System Management

- 1). uname
- 2). df (disk free)
- 3). top or htop
- 4). history

- uname : It is used to provide the details about the operating system kernel, hardware, and other system-related attributes.
- df (disk free) : It is a command used to display information about the total , used and available disk space for file systems mounted on the system.

```
prapti-uniyal@shiven-VirtualBox:~$ df
Filesystem      1K-blocks      Used Available Use% Mounted on
tmpfs            1020192       1232    1018960   1% /run
/dev/sda3      54651828  18245048   33598204  36% /
tmpfs            5100960         0    5100960   0% /dev/shm
tmpfs             5120          8     5112   1% /run/lock
/dev/sda2      524252        6288    517964   2% /boot/efi
tmpfs            1020192       200    1019992   1% /run/user/1001
prapti-uniyal@shiven-VirtualBox:~$
```

- df -h : It displays the information about the total , used and available disk space in a human readable form.
- top and htop : ‘top’ and ‘htop’ both are command-line utilities used for real time monitoring of system processes and resource usage.

```
prapti1011@asus:/mnt/c/Users/ASUS/OneDrive/Desktop/day6$ top
top - 12:28:33 up 1:43, 1 user, load average: 0.00, 0.02, 0.00
Tasks: 26 total, 1 running, 25 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 3610.2 total, 2994.5 free, 478.3 used, 213.7 buff/cache
MiB Swap: 1024.0 total, 1024.0 free, 0.0 used. 3131.9 avail Mem

 PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM TIME+ COMMAND
 753 prapti1+  20   0    9412   5504   3328 R  0.3  0.1  0:00.09 top
    1 root      20   0   21672  12028   9212 S  0.0  0.3  0:02.14 systemd
    2 root      20   0    3060   1664   1664 S  0.0  0.0  0:00.02 init-systemd(Ub
    7 root      20   0    3060   1792   1792 S  0.0  0.0  0:00.00 init
   46 root      19  -1   66828  16340  15572 S  0.0  0.4  0:00.63 systemd-journal
   95 root      20   0   25452   6144   4864 S  0.0  0.2  0:00.46 systemd-udevd
  153 systemd+ 20   0   21456  12672  10496 S  0.0  0.3  0:00.24 systemd-resolve
  154 systemd+ 20   0   91024   7680   6784 S  0.0  0.2  0:00.18 systemd-timesyncd
  163 root      20   0    4236   2432   2304 S  0.0  0.1  0:00.02 cron
  164 message+ 20   0    9592   4736   4224 S  0.0  0.1  0:00.19 dbus-daemon
  175 root      20   0   17968   8448   7552 S  0.0  0.2  0:00.22 systemd-logind
  177 root      20   0  469056  12444  10780 S  0.0  0.3  0:00.30 udisksd
  178 root      20   0 1756096  11904   9984 S  0.0  0.3  0:00.29 wsl-pro-service
  185 syslog    20   0   222508   5248   4480 S  0.0  0.1  0:00.17 rsyslogd
  204 root      20   0    3160   1920   1792 S  0.0  0.1  0:00.02 agetty
  207 root      20   0    3116   1792   1664 S  0.0  0.0  0:00.02 agetty
  208 root      20   0  112740  24192  14464 S  0.0  0.7  0:00.27 unattended-upgr...
  214 polkitd   20   0  308164   7744   6976 S  0.0  0.2  0:00.22 polkitd
  325 root      20   0    6688   4352   3712 S  0.0  0.1  0:00.03 login
  377 prapti1+  20   0   20368  11264   9216 S  0.0  0.3  0:00.29 systemd
  378 prapti1+  20   0   21188   3528   1792 S  0.0  0.1  0:00.00 (sd-pam)
  387 prapti1+  20   0    6072   4992   3456 S  0.0  0.1  0:00.05 bash
  419 root      20   0    3068    896    896 S  0.0  0.0  0:00.00 SessionLeader
  420 root      20   0    3084   1152   1024 S  0.0  0.0  0:00.14 Relay(426)
  426 prapti1+  20   0    6204   5120   3456 S  0.0  0.1  0:00.22 bash
  719 root      20   0  370088  20436  17620 S  0.0  0.6  0:00.11 packagekitd
```

```

prapti-uniyal@shiven-VirtualBox:~$ sudo apt insatll htop
This is the Linux Mint "apt" command.

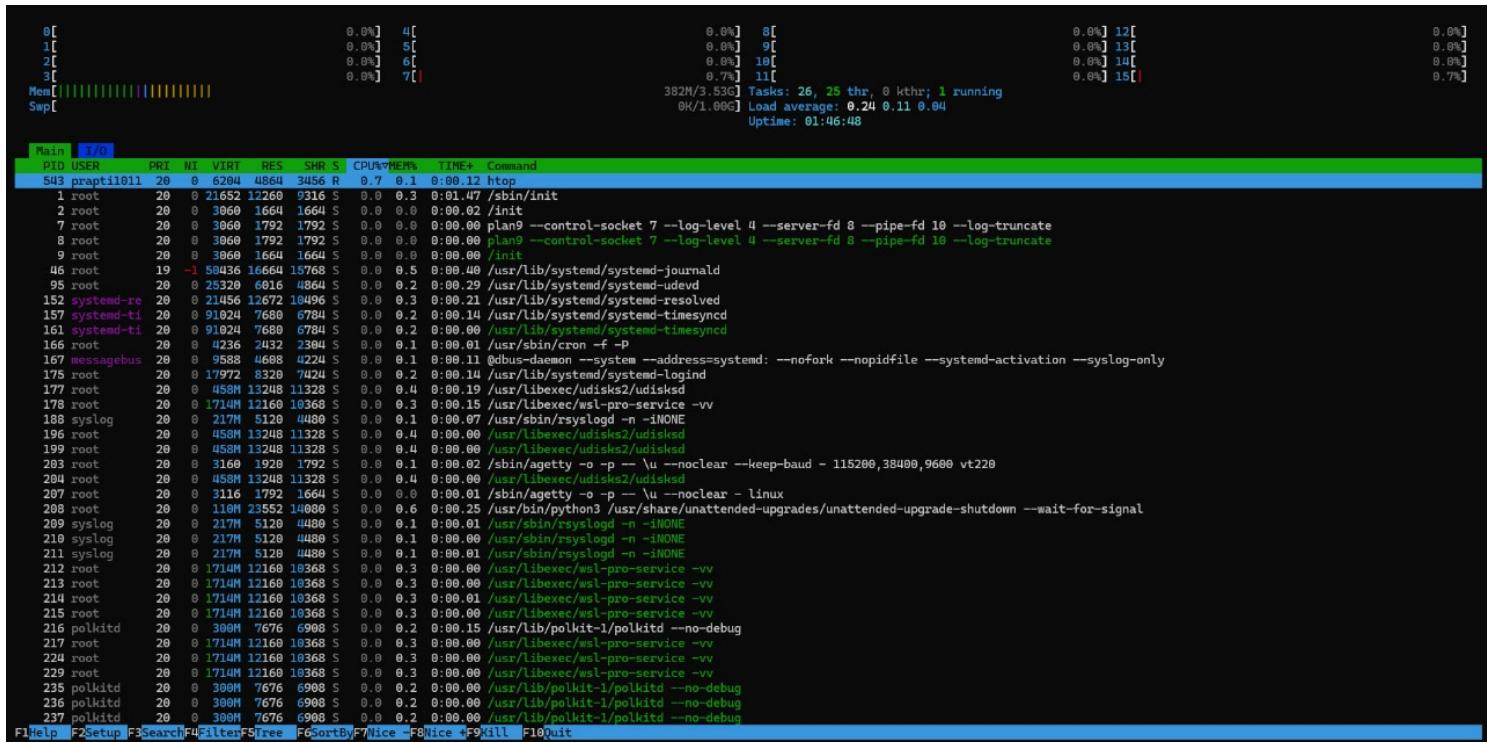
This commands acts as a wrapper for the APT package manager and many other useful tools such as apt-get, apt-cache, apt-mark, dpkg, aptitude...etc.

It is installed in /usr/local/bin/apt. To use the upstream apt command directly type /usr/bin/apt.

Usage: apt command [options]
      apt help command [options]

Commands:
  add-repository      - Add entries to apt sources.list
  autoclean            - Erase cache for packages no longer available
  autopurge            - Erase system-wide config files left by removed packages
  autoremove           - Remove dependency packages no longer required
  build                - Build binary or source packages from sources
  build-dep            - Configure build-dependencies for source packages
  changelog            - View a package's changelog
  check                - Verify there are no broken dependencies
  clean                - Erase downloaded archive files
  contains             - List packages containing a file
  content              - List files contained in and installed by a package(s)
  deb                  - Install a local .deb package
  depends              - Show package dependency information
  dist-upgrade         - Fully upgrade the system by allowing other package changes
  download             - Download packages to the current working directory
  edit-sources         - Edit /etc/apt/sources.list with your preferred text editor
  dselect-upgrade      - Follow dselect selections

```



- history : It displays the history of commands executed on the terminal.

```
prapti-uniyal@shiven-VirtualBox:~$ history
```

```
1 ls
2 ls -l
3 ls -s
4 mkdir Prapti
5 cd Prapti
6 pwd
7 cd home
8 rmdir Prapti
9 cd
10 mkdir Linuxlab
11 rmdir Prapti
12 ls
13 touch Exp2.txt
14 touch Experiment2.txt
15 nano Exp2.txt
16 cp Exp2.txt Experiment2.txt
17 mv Experiment2.txt Linuxlab
18 rmv Exp2.txt
19 ls
20 rm Exp2.txt
21 ls
22 touch Mouse.txt
23 mv Mouse.txt LinuxLab
24 cd LinuxLab
25 mv Mouse.txt Linuxlab
26 cd Linuxlab
27 touch Mouse.txt
28 nano M0use.txt
29 cat Mouse.txt Experiment2.txt
30 cat Mouse.txt
31 cat Experiment2.txt
32 less Mouse.txt
33 more Mouse.txt
34 More Experiment2.txt
35 more Experiment2.txt
36 less EXperiment2.txt
37 less Experiment2.txt
38 head Experiment2.txt
39 tail Experiment2.txt
```

Procedure & Observations

Exercise 1: [File System Navigation]

Command(s):

1. Go to your home directory cd
2. Check your current location pwd
3. Create a project structure mkdir -p projects/linux_practice/{scripts,documents,backup}
4. Navigate to the scripts folder cd projects/linux_practice/scripts
5. Create some files touch setup.sh cleanup.sh readme.txt
6. List the files with details ls -la
7. Go back to linux_practice directory cd ..
8. List all subdirectories ls -la

Output:

```
prapti-uniyal@shiven-VirtualBox:~$ cd
prapti-uniyal@shiven-VirtualBox:~$ pwd
/home/prapti-uniyal
prapti-uniyal@shiven-VirtualBox:~$ mkdir -p projects/linux_practice/{scripts,documents,backups}
prapti-uniyal@shiven-VirtualBox:~$ cd projects/linux_practice/scripts
bash: cd: projects/linux_practice/scripts: No such file or directory
prapti-uniyal@shiven-VirtualBox:~$ cd projects/linux_practice/scripts
bash: cd: projects/linux_practice/scripts: No such file or directory
prapti-uniyal@shiven-VirtualBox:~$ cd projects
prapti-uniyal@shiven-VirtualBox:~/projects$ ls
linux_practice
prapti-uniyal@shiven-VirtualBox:~/projects$ cd linux_practice
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls
backups documents scripts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd scripts
bash: cd: scripts: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd script
bash: cd: script: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd scripts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/scripts$ touch setup.sh cleanup.sh readme.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/scripts$ ls -la
total 8
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:26 .
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
-rw-rw-r-- 1 prapti-uniyal prapti-uniyal 0 Sep 23 22:26 cleanup.sh
-rw-rw-r-- 1 prapti-uniyal prapti-uniyal 0 Sep 23 22:26 readme.txt
-rw-rw-r-- 1 prapti-uniyal prapti-uniyal 0 Sep 23 22:26 setup.sh
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/scripts$ cd
prapti-uniyal@shiven-VirtualBox:~/projects$ cd projects/linux_practice
bash: cd: projects/linux_practice: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects$ cd projects
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd linux_practice
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls -la
total 20
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 .
drwxrwxr-x 3 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 backups
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 documents
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:26 scripts
```

Exercise 2: [File Operations and Permissions]

Command(s):

1. Go to documents folder cd ~/projects/linux_practice/documents
2. Create a text file echo "This is a practice document" > practice.txt
3. Check current permissions ls -l practice.txt
4. Make it readable by everyone chmod 644 practice.txt
5. Copy to backup folder cp practice.txt/backup/
6. Create a backup with timestamp cp practice.txt/backup/practice_backup_\$(date +%Y%m%d).txt
7. List backup folder contents ls -la/backup/

Output:

```
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls -la
total 20
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 .
drwxrwxr-x 3 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 backups
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 documents
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:26 scrpts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd documents
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ touch practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ nano practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ ls -l
total 4
-rw-rw-r-- 1 prapti-uniyal prapti-uniyal 29 Sep 23 22:32 practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ chmod 644 practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ../backups/
cp: cannot create regular file '../backups/': Not a directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ./backups/
cp: cannot create regular file './backups/': Not a directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cd backups
bash: cd: backups: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cd
prapti-uniyal@shiven-VirtualBox:~$ cd projrcts
bash: cd: projrcts: No such file or directory
prapti-uniyal@shiven-VirtualBox:~$ cd projects
prapti-uniyal@shiven-VirtualBox:~/projects$ cd linux_practice
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd backups
bash: cd: backups: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd documents
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ../backups/
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ../backups/practice_backup_$(date +%Y%m%d)
cp: target '23': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ./backups/practice_backup_$(date +%Y%m%d).txt
cp: target '23.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ ls -la
total 12
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:32 .
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
-rw-r--r-- 1 prapti-uniyal prapti-uniyal 29 Sep 23 22:32 practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ./backups/practice_backup_$(date +%Y%m%d).txt
cp: target '23.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ █
```

Exercise 3: [Text Editing and Viewing]

Command(s):

1. Create a larger file for practice cd ~/projects/linux_practice/documents seq 1 50 > numbers.txt
2. View first 10 lines head numbers.txt
3. View last 5 lines tail -n 5 numbers.txt
4. Search for specific number cat numbers.txt | grep "25"
5. Edit the file with nano nano numbers.txt Add a comment at the top: "# Number list from 1 to 50" Save with Ctrl+O, exit with Ctrl+X
6. View the modified file cat numbers.txt

Output:

```
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls -la
total 20
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 .
drwxrwxr-x 3 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 backups
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 documents
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:26 scrpts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd documents
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ touch practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ nano practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ ls -l
total 4
-rw-rw-r-- 1 prapti-uniyal prapti-uniyal 29 Sep 23 22:32 practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ chmod 644 practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ../backups/
cp: cannot create regular file '../backups/': Not a directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ./backups/
cp: cannot create regular file './backups/': Not a directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cd backups
bash: cd: backups: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cd
prapti-uniyal@shiven-VirtualBox:~$ cd projrcts
bash: cd: projrcts: No such file or directory
prapti-uniyal@shiven-VirtualBox:~$ cd projects
prapti-uniyal@shiven-VirtualBox:~/projects$ cd linux_practice
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd backups
bash: cd: backups: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ cd documents
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ../backups/
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ../backups/practice_backup_$(date +%Y%m%d)
cp: target '23': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ./backups/practice_backup_$(date +%Y%m%d).txt
cp: target '23.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ ls -la
total 12
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:32 .
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
-rw-r--r-- 1 prapti-uniyal prapti-uniyal 29 Sep 23 22:32 practice.txt
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cp practice.txt ./backups/practice_backup_$(date +%Y%m%d).txt
cp: target '23.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ █
```

Exercise 4: [System Exploration]

Command(s):

1. Check system information uname -a
2. Check disk usage df -h
3. See your recent commands history 10
4. Check who's logged in who
5. Find your username whoami
6. Check current processes (press 'q' to quit) top

Output:

```
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ uname -a
Linux shiven-VirtualBox 6.14.0-29-generic #29~24.04.1-Ubuntu SMP PREEMPT_DYNAMIC Thu Aug 14 16:52:50 UTC 2 x86_64 x86_64 x86_64 GNU/Linux
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs          997M   1.3M  996M  1% /run
/dev/sda3        53G   18G  33G  35% /
tmpfs           4.9G     0  4.9G  0% /dev/shm
tmpfs           5.0M   8.0K  5.0M  1% /run/lock
/dev/sda2       512M   6.2M  506M  2% /boot/efi
tmpfs          997M  204K  997M  1% /run/user/1001
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ history 10
165 cp practice.txt ..../backups/practice_backup_$(date +%Y-%m-%d).txt
166 seq 1 50 > numbers.txt
167 head numbers.txt
168 tail -n 5 numbers.txt
169 cat numbers.txt | grep "25"
170 nano numbers.txt
171 cat numbers.txt
172 uname -a
173 df -h
174 history 10
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ who
prapti-uniyal tty7 2025-09-23 17:37 (:0)
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ whoami
prapti-uniyal
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ top
top - 23:06:10 up 5:30, 1 user, load average: 0.46, 0.22, 0.12
Tasks: 247 total, 1 running, 246 sleeping, 0 stopped, 0 zombie
Cpu(s): 0.0 us, 0.0 sy, 0.0 ni, 99.9 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 9962.8 total, 5669.5 free, 1254.0 used, 3376.4 buff/cache
Swap: 2048.0 total, 2048.0 free, 0.0 used, 8708.8 avail Mem

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1628	prapti-+	20	0	5528184	299160	161648	S	1.8	2.9	109:08.23	cinnamon
994	root	20	0	389236	123884	72824	S	1.2	1.2	2:43.80	Xorg

Exercise 5: [Cleanup]

Command(s):

1. Go to practice directory cd ~/projects/linux_practice
2. Remove a test file safely rm -i documents/numbers.txt
3. Remove empty directory (if any) First try: rmdir backup # This might fail if not empty Then: rm -r backup # This removes directory and contents
4. List what remains ls -la
5. Check history of your session history | tail -20

Output:

```
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice/documents$ cd
prapti-uniyal@shiven-VirtualBox:~$ cd projects
prapti-uniyal@shiven-VirtualBox:~/projects$ cd linux_practice
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ rm -i documents/numbers.txt
rm: cannot remove 'documents/numbers.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ rm -i numbers.txt
rm: cannot remove 'numbers.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ rm -i documents/numbers.txt
rm: remove regular file 'documents/numbers.txt'? y
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ rm -r documents/numbers.txt
rm: cannot remove 'documents/numbers.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls
backips documents scrpts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ rm -r documents
rm: cannot remove 'documents': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls
backips documents scrpts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls -la
total 20
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 .
drwxrwxr-x 3 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:37 backips
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 23:13 documents
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:26 scrpts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ history | tail -20
171 cat numbers.txt
172 uname -a
173 df -h
174 history 10
175 who
176 whoami
177 top
178 cd pdocumnets
179 cd documents
180 cd
181 cd projects
182 cd linux practice
```

```
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ ls -la
total 20
drwxrwxr-x 5 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 .
drwxrwxr-x 3 prapti-uniyal prapti-uniyal 4096 Sep 23 22:21 ..
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:37 backips
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 23:13 documents
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 22:26 scrpts
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$ history | tail -20
171 cat numbers.txt
172 uname -a
173 df -h
174 history 10
175 who
176 whoami
177 top
178 cd pdocumnets
179 cd documents
180 cd
181 cd projects
182 cd linux_practice
183 rm -i documents/numbers.txt
184 rm -i numbers.txt
185 rm -i documents/numbers.txt
186 rm -r documents/numbers.txt
187 ls
188 rm -r documnets
189 ls
190 ls -la
prapti-uniyal@shiven-VirtualBox:~/projects/linux_practice$
```

[LAB EXAM/TASKS]

Task [1]: [Directory navigation]

Output:

```
prapti-uniyal@shiven-VirtualBox:~$ mkdir test_project/docs test_project/scripts test_project/data
prapti-uniyal@shiven-VirtualBox:~$ cd test_project/scripts
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ pwd
/home/prapti-uniyal/test_project/scripts
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ cd
```

Task [2]: [Directory navigation]

Output:

```
/home/prapti-uniyal/test_project/scripts
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ cd
prapti-uniyal@shiven-VirtualBox:~$ cd test_project
prapti-uniyal@shiven-VirtualBox:~/test_project$ cd docs
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ touch readme.txt notes.txt todo.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ echo "Project documentation" > readme.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ echo "Important notes: > notes.txt
> ^C
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ echo "Important notes" > notes.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cat readme.txt
cat: readme.txt: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cat readme.txt
Project documentation
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cat notes.txt
Important notes
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cp readme.txt data/project_info.txt
cp: cannot create regular file 'data/project_info.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cp readme.txt data
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv data project_info.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv .docs/todo.txt scripts/
```

Task [3]: [Directory navigation]

Output:

```
cp: cannot create regular file 'data/project_info.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cp readme.txt data
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv data project_info.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv .docs/todo.txt scripts/
mv: cannot stat '.docs/todo.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ move docs/todo.txt scripts/
Command 'move' not found, did you mean:
  command 'mmove' from deb mtools (4.0.43-1)
  command 'jove' from deb jove (4.17.5.3-1)
  command 'love' from deb love (11.4-1)
  command 'lmove' from deb suck (4.3.4-1build1)
  command 'more' from deb util-linux (2.39.3-9ubuntu6.3)
Try: sudo apt install <deb name>
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv docs/todo.txt scripts/
mv: cannot stat 'docs/todo.txt': No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv todo.txt scrpts
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ 
```

Task [4]: [File permissions]

Output:

```
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ cd
prapti-uniyal@shiven-VirtualBox:~$ cd test_project
prapti-uniyal@shiven-VirtualBox:~/test_project$ cd scripts
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ touch backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ echo '#!/bin/bash' >> backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ echo 'echo "Backup complete"' >> backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ chmod u+x backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ chmod go-x backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ nano backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ ls -l
total 8
-rw-rw-r-- 1 prapti-uniyal prapti-uniyal 12 Sep 24 00:14 backup.sh
-rwxrw-r-- 1 prapti-uniyal prapti-uniyal 35 Sep 24 00:16 backup.sh
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ ./backup.sh
Backup complete
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ 
```

Task [5]: [File viewing]

Output:

```
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5 number.txt
head: cannot open 'number.txt' for reading: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5v numbers.txt
head: invalid number of lines: '5v'
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5 numbers.txt
1
2
3
4
5
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ tail -n 3 numbers.txt
18
19
20
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ grep '1' numbers.txt
1
10
11
12
13
14
15
16
17
18
19
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$
```

```
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ mv todo.txt scripts
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ touch numbers.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ seq 1 20 > numbers.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5
^C
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5 number.txt
head: cannot open 'number.txt' for reading: No such file or directory
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5v numbers.txt
head: invalid number of lines: '5v'
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ head -n 5 numbers.txt
1
2
3
4
5
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ tail -n 3 numbers.txt
18
19
20
prapti-uniyal@shiven-VirtualBox:~/test_project/docs$ grep '1' numbers.txt
1
10
11
```

Task [6]: [Text editing]

Output:

```
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ ./backup.sh
Backup complete
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ nano config.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ cat config.txt
Database=localhost Port=5432 Username=adminis
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ █
```

Task [7]: [System information]

Output:

```
Database=localhost Port=5432 Username=adminis
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ echo -e "USER\nDate: $date)\nCurrent Directory: $(pwd)\n\nDisk Usage:\n$(df -h)" > system_info.txt
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ cat system_info.txt
SER
ate: date)
urrent Directory: /home/prapti-uniyal/test_project/scripts

Disk Usage:
Filesystem      Size  Used Avail Use% Mounted on
mpfs            997M  1.3M  996M  1% /run
dev/sda3        53G   18G   33G  35% /
mpfs            4.9G    0    4.9G  0% /dev/shm
mpfs            5.0M  8.0K  5.0M  1% /run/lock
dev/sda2        512M  6.2M  506M  2% /boot/efi
mpfs            997M  208K  997M  1% /run/user/1001
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ █
```

Task [8]: [File organization]

Output:

```
prapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ cd ~/test_project
prapti-uniyal@shiven-VirtualBox:~/test_project$ mkdir -p backup
prapti-uniyal@shiven-VirtualBox:~/test_project$ find . -typef -na,e"*.txt" -not -path "*/backup/*" -exec cp {} backup/\;
find: unknown predicate `‐typef'
prapti-uniyal@shiven-VirtualBox:~/test_project$ find . -type f -na,e"*.txt" -not -path "*/backup/*" -exec cp {} backup/\;
find: unknown predicate `‐na,e*.txt'
prapti-uniyal@shiven-VirtualBox:~/test_project$ find . -type f -name"*.txt" -not -path "*/backup/*" -exec cp {} backup/\;
find: unknown predicate `‐name*.txt'
prapti-uniyal@shiven-VirtualBox:~/test_project$ find . -type f -name "*.txt" -not -path "*/backup/*" -exec cp {} backup/\;
find: missing argument to `‐exec'
prapti-uniyal@shiven-VirtualBox:~/test_project$ find . -type f -name "*.txt" -not -path "*/backup/*" -exec cp {} backup/\;
find: missing argument to `‐exec'
prapti-uniyal@shiven-VirtualBox:~/test_project$ find . -type f -name "*.txt" -not -path "*/backup/*" -exec cp {} backup/ \
prapti-uniyal@shiven-VirtualBox:~/test_project$ ls -l
total 16
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 24 00:44 backup
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 23:36 data
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 23 23:57 docs
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 24 00:31 scripts
prapti-uniyal@shiven-VirtualBox:~/test_project$
```

Task [9]: [Process and history]

Output:

```
drwxrwxr-x 2 prapti-uniyal prapti-uniyal 4096 Sep 24 00:31 scripts
prapti-uniyal@shiven-VirtualBox:~/test_project$ history
1 ls
2 ls -l
3 ls -s
4 mkdir Prapti
5 cd Prapti
6 pwd
7 cd home
8 rmdir Prapti
9 cd
10 mkdir Linuxlab
11 rmdir Prapti
12 ls
13 touch Exp2.txt
14 touch Experiment2.txt
15 nano Exp2.txt
16 cp Exp2.txt Experiment2.txt
17 mv Experiment2.txt Linuxlab
18 rmv Exp2.txt
19 ls
20 rm Exp2.txt
21 ls
22 touch Mouse.txt
23 mv Mouse.txt LinuxLab
24 cd LinuxLab
25 mv Mouse.txt Linuxlab
26 cd Linuxlab
27 touch Mouse.txt
28 nano M0use.txt
29 cat Mouse.txt Experiment2.txt
30 cat Mouse.txt
31 cat Experiment2.txt
32 less Mouse.txt
33 more Mouse.txt
34 More Experiment2.txt
35 more Experiment2.txt
36 less EXperiment2.txt
37 less Experiment2.txt
38 head Experiment2.txt
39 tail Experiment2.txt
40 cd
41 whoami
```

```

252 chmod go-x backup.sh
253 nano backup.sh
254 ls -l
255 ./backup.sh
256 nano config.txt
257 cat config.txt
258 echo -e "USER\nDate: $date)\nCurrent Directory: $(pwd)\n\nDisk Usage:\n$(df -h)" > system_info.txt
259 cat system_info.txt
260 cd ~/test_project
261 mkdir -p backup
262 find . -typef -na,e"*.txt" -not -path */backup/* -exec cp {} backup/`;
263 find . -type f -na,e"*.txt" -not -path */backup/* -exec cp {} backup/`;
264 find . -type f -name"*.txt" -not -path */backup/* -exec cp {} backup/`;
265 find . -type f -name "*.txt" -not -path */backup/* -exec cp {} backup/`;
266 find . -type f -name "*.txt" -not -path */backup/* -exec cp {} backup/`;
267 ls -l
268 history
rapti-uniyal@shiven-VirtualBox:~/test_project$
```

Task [10]: [Comprehensive cleanup]

Output:

```

rapti-uniyal@shiven-VirtualBox:~/test_project$ history | wc -l
69
rapti-uniyal@shiven-VirtualBox:~/test_project$ history | tail -n 10
261 mkdir -p backup
262 find . -typef -na,e"*.txt" -not -path */backup/* -exec cp {} backup/`;
263 find . -type f -na,e"*.txt" -not -path */backup/* -exec cp {} backup/`;
264 find . -type f -name"*.txt" -not -path */backup/* -exec cp {} backup/`;
265 find . -type f -name "*.txt" -not -path */backup/* -exec cp {} backup/`;
266 find . -type f -name "*.txt" -not -path */backup/* -exec cp {} backup/`;
267 ls -l
268 history
269 history | wc -l
270 history | tail -n 10
rapti-uniyal@shiven-VirtualBox:~/test_project$
```

```

backup data docs scripts
rapti-uniyal@shiven-VirtualBox:~/test_project$ cd scripts
rapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ chmod 754 backup.sh
rapti-uniyal@shiven-VirtualBox:~/test_project/scripts$ cd ~/test_project
rapti-uniyal@shiven-VirtualBox:~/test_project$ file_count=$(find . -type f | wc -l)
Command 'find.' not found, did you mean:
  command 'findv' from deb polylib-utils (5.22.5-4+dfsg)
  command 'find' from deb findutils (4.9.0-5)
  command 'findg' from deb ncl-ncarg (6.6.2.dfsg.1-3)
Try: sudo apt install <deb name>
rapti-uniyal@shiven-VirtualBox:~/test_project$ file_count=$(find . -type f | wc -l)
> ^C
rapti-uniyal@shiven-VirtualBox:~/test_project$ file_count=$(find . -type f | wc -l)
rapti-uniyal@shiven-VirtualBox:~/test_project$ dir_count=$(find . -type d | wc -l)
rapti-uniyal@shiven-VirtualBox:~/test_project$ echo "Total files : $file_count" > summary.txt
rapti-uniyal@shiven-VirtualBox:~/test_project$ echo "Total directories : $dir_count" >> summary.txt
rapti-uniyal@shiven-VirtualBox:~/test_project$ cat summary.txt
Total files : 15
Total directories : 5
rapti-uniyal@shiven-VirtualBox:~/test_project$
```

Challenges faced:

- Was unable to understand the `umask` calculation in the begining which I overcame by revising the subtraction method.

Learning:

- Understood file permissions and their significance.
- Learned how to use `chmod` and `umask` effectively.

Result:

- All the exercises and tasks were successfully completed for basic commanmds and file system permissions