

Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

a) Navigate and List: a. Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.

```
cdac@LAPTOP-184M49M6:~$ cd /home
cdac@LAPTOP-184M49M6:/home$ ls -al
total 16
drwxr-xr-x  4 root  root  4096 Aug 28 09:49 .
drwxr-xr-x 19 root  root  4096 Aug 28 18:04 ..
drwxr-x---  6 cdac  cdac  4096 Aug 28 09:49 cdac
drwxr-x---  2 user2 user2 4096 Aug 28 09:49 user2
cdac@LAPTOP-184M49M6:/home$ mkdir linuxAssignment
mkdir: cannot create directory 'linuxAssignment': Permission denied
cdac@LAPTOP-184M49M6:/home$ sudo mkdir linuxAssignment
[sudo] password for cdac:
cdac@LAPTOP-184M49M6:/home$ ls
cdac  linuxAssignment  user2
cdac@LAPTOP-184M49M6:/home$
```

b) File Management: a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo nano file1.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo cat file1.txt
Hello

cdac@LAPTOP-184M49M6:/home/linuxAssignment$ |
```

c) Directory Management: a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ mkdir docs
mkdir: cannot create directory 'docs': Permission denied
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo mkdir docs
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ ls -l
total 8
drwxr-xr-x  2 root  root  4096 Aug 28 18:59 docs
-rw-r--r--  1 root  root     0 Aug 28 18:55 file.txt
-rw-r--r--  1 root  root     7 Aug 28 18:57 file1.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ |
```

d) Copy and Move Files: a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ cp file1.txt docs/file2.txt
cp: cannot create regular file 'docs/file2.txt': Permission denied
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo cp file1.txt docs/file2.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo cat file2.txt
cat: file2.txt: No such file or directory
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ cd docs
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ cat file2.txt
Hello

cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$
```

e) Permissions and Ownership: a. Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others. Then, change the owner of "file2.txt" to the current user.

f) Final Checklist: a. Finally, list the contents of the "linuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ chmod o
+wx file2.txt
chmod: changing permissions of 'file2.txt': Operation not permitted
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ sudo ch
mod o+wx file2.txt
[sudo] password for cdac:
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ chown cdac file2.txt
chown: changing ownership of 'file2.txt': Operation not permitted
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ sudo chown cdac file2.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ ls -l
total 4
-rw-r--rwx 1 cdac root 7 Aug 28 19:04 file2.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ cd..
cd..: command not found
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ cd ..
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ ls -l
total 8
drwxr-xr-x 2 root root 4096 Aug 28 19:04 docs
-rw-r--r-- 1 root root  0 Aug 28 18:55 file.txt
-rw-r--r-- 1 root root  7 Aug 28 18:57 file1.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$
```

g) File Searching: a. Search for all files with the extension ".txt" in the current directory and its subdirectories. b. Display lines containing a specific word in a file (provide a file name and the specific word to search).

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ find /home/linuxAssignment/docs -type f -name "file2.txt"
/home/linuxAssignment/docs/file2.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ grep "Hello" file2.txt
Hello
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$
```

h) System Information: a. Display the current system date and time.

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ date
Fri Aug 30 08:48:58 IST 2024
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$
```

i) Networking: a. Display the IP address of the system. b. Ping a remote server to check connectivity (provide a remote server address to ping).

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ hostname -I
172.20.94.147
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 172.20.94.147 netmask 255.255.240.0 broadcast 172.20.95.255
    inet6 fe80::215:5dff:fe65:48a2 prefixlen 64 scopeid 0x20<link>
    ether 00:15:5d:65:48:a2 txqueuelen 1000 (Ethernet)
    RX packets 3396 bytes 4247030 (4.2 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 992 bytes 113609 (113.6 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 30 bytes 3526 (3.5 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 30 bytes 3526 (3.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ ip addr
show
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:65:48:a2 brd ff:ff:ff:ff:ff:ff
    inet 172.20.94.147/20 brd 172.20.95.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe65:48a2/64 scope link
        valid_lft forever preferred_lft forever
cdac@LAPTOP-184M49M6:/home/linuxAssignment/docs$
```

```
cdac@LAPTOP-184M49M6:~$ ping www.google.com
PING www.google.com (142.250.66.4) 56(84) bytes of data.
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=1 ttl=58 time=17.1 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=2 ttl=58 time=18.0 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=3 ttl=58 time=16.9 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=4 ttl=58 time=17.2 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=5 ttl=58 time=16.5 ms
^X64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=6 ttl=58 time=16.7 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=7 ttl=58 time=16.8 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=8 ttl=58 time=17.1 ms
64 bytes from 4.66.250.142.in-addr.arpa (142.250.66.4): icmp_seq=9 ttl=58 time=16.9 ms
^C
--- www.google.com ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8013ms
rtt min/avg/max/mdev = 16.471/17.016/17.977/0.394 ms
cdac@LAPTOP-184M49M6:~$
```

j) File Compression: a. Compress the "docs" directory into a zip file. b. Extract the contents of the zip file into a new directory.

```
cdac@LAPTOP-184M49M6:/home$ zip -r linuxAssignment.zip linuxAssignment
zip I/O error: Permission denied
zip error: Could not create output file (linuxAssignment.zip)
cdac@LAPTOP-184M49M6:/home$ sudo zip -r linuxAssignment.zip linuxAssignment
[sudo] password for cdac:
  adding: linuxAssignment/ (stored 0%)
  adding: linuxAssignment/docs.zip (stored 0%)
  adding: linuxAssignment/docs/ (stored 0%)
  adding: linuxAssignment/docs/file2.txt (stored 0%)
  adding: linuxAssignment/file.txt (stored 0%)
  adding: linuxAssignment/file1.txt (stored 0%)
cdac@LAPTOP-184M49M6:/home$ unzip linuxAssignment.zip -d linuxAssignment
Archive:  linuxAssignment.zip
checkdir error:  cannot create linuxAssignment/linuxAssignment
Permission denied
unable to process linuxAssignment/.
checkdir error:  cannot create linuxAssignment/linuxAssignment
Permission denied
unable to process linuxAssignment/docs.zip.
checkdir error:  cannot create linuxAssignment/linuxAssignment
Permission denied
unable to process linuxAssignment/docs/.
checkdir error:  cannot create linuxAssignment/linuxAssignment
Permission denied
unable to process linuxAssignment/docs/file2.txt.
checkdir error:  cannot create linuxAssignment/linuxAssignment
Permission denied
unable to process linuxAssignment/file.txt.
checkdir error:  cannot create linuxAssignment/linuxAssignment
Permission denied
unable to process linuxAssignment/file1.txt.
cdac@LAPTOP-184M49M6:/home$ sudo unzip linuxAssignment.zip -d li
nuxAssignment
Archive:  linuxAssignment.zip
  creating: linuxAssignment/linuxAssignment/
  extracting: linuxAssignment/linuxAssignment/docs.zip
    creating: linuxAssignment/linuxAssignment/docs/
  extracting: linuxAssignment/linuxAssignment/docs/file2.txt
  extracting: linuxAssignment/linuxAssignment/file.txt
  extracting: linuxAssignment/linuxAssignment/file1.txt
cdac@LAPTOP-184M49M6:/home$
cdac@LAPTOP-184M49M6:/home$
```

k) File Editing: a. Open the "file1.txt" file in a text editor and add some text to it. b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

```
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ nano file1.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ cat file1.txt
Hello

cdac@LAPTOP-184M49M6:/home/linuxAssignment$ nano file1.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo nano file1.txt
le1.txt
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ cat file1.txt
t
Hello
Priyanka Bolaj

cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sed -i 's/Hello/Hii/g' file1.txt
sed: couldn't open temporary file ./sedj3xrFW: Permission denied
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ sudo sed -i
's/Hello/Hii/g' file1.txt
[sudo] password for cdac:
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ cat file1.txt
t
Hii
cdac@LAPTOP-184M49M6:/home/linuxAssignment$ |

cdac@LAPTOP-184M49M6:/home/linuxAssignment$
```

Problem 2: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

- a. Suppose you have a file named "data.txt" containing important information. Display the first 10 lines of this file to quickly glance at its contents using a command.

```
cdac@LAPTOP-184M49M6:/home$ sudo nano data.txt
[sudo] password for cdac:
cdac@LAPTOP-184M49M6:/home$ head data.txt
: Introduction to Linux
It is an Open Source operating system. It is available free to use and user can modify it according their need.
The founder or linux is Linun Torwards. It available since 1991.
An Open Source Community is woking behind the updation and upgradation of the linux code.
Feature
1. No Cost / Low Cost
2. Multi-Tasking
3. Security
4. Multi-User
```

- b. Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.

```
cdac@LAPTOP-184M49M6:/home$ tail data.txt
3. /etc: Configuration Files
4. /dev: Device Files
5. /proc: Process Information
6. /var: Variables Files
7. /tmp: Temporary Files
8. /usr: User Programs
9. /home: Parent directory of user friendly directory
10. /boot: Boot Loader Files
11. /opt:Apps
12. /lib: System Libraries
cdac@LAPTOP-184M49M6:/home$ tail 5 data.txt
tail: cannot open '5' for reading: No such file or directory
==> data.txt <==
3. /etc: Configuration Files
4. /dev: Device Files
5. /proc: Process Information
6. /var: Variables Files
7. /tmp: Temporary Files
8. /usr: User Programs
9. /home: Parent directory of user friendly directory
10. /boot: Boot Loader Files
11. /opt:Apps
12. /lib: System Libraries
cdac@LAPTOP-184M49M6:/home$ tail -n 5 data.txt
8. /usr: User Programs
9. /home: Parent directory of user friendly directory
10. /boot: Boot Loader Files
11. /opt:Apps
12. /lib: System Libraries
cdac@LAPTOP-184M49M6:/home$ |
```

- c. In a file named "numbers.txt," there are a series of numbers. Display the first 15 lines of this file to analyze the initial data set.
- d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".

```
cdac@LAPTOP-184M49M6:/home$ sudo nano numbers.txt
[sudo] password for cdac:
cdac@LAPTOP-184M49M6:/home$ head -15 numbers.txt
11242341414
14141412424234
1241241446546
2435436412412453
35346346234464
2445547669
433254756876
312435476876
23254768
314356575
21456789
34253678
3423564578
234567
232453647342356786
cdac@LAPTOP-184M49M6:/home$ tail -3 numbers.txt
65348756223
764234732423865
263589235832
cdac@LAPTOP-184M49M6:/home$ |
```


- e. Imagine you have a file named "input.txt" with text content. Use a command to translate all lowercase letters to uppercase in "input.txt" and save the modified text in a new file named "output.txt."

```
cdac@LAPTOP-184M49M6:/home$ sudo nano input.txt
cdac@LAPTOP-184M49M6:/home$ cat input.txt
priyanka bolaj
cdac@LAPTOP-184M49M6:/home$ tr '[:lower:]' '[:upper:]' < input.txt > output.txt
-bash: output.txt: Permission denied
cdac@LAPTOP-184M49M6:/home$ sudo tr '[:lower:]' '[:upper:]' < in
put.txt > output.txt
-bash: output.txt: Permission denied
cdac@LAPTOP-184M49M6:/home$ sudo nano output.txt
cdac@LAPTOP-184M49M6:/home$ chmod a+wx ouput.txt
chmod: cannot access 'ouput.txt': No such file or directory
cdac@LAPTOP-184M49M6:/home$ chmod a+wx output.txt
chmod: cannot access 'output.txt': No such file or directory
cdac@LAPTOP-184M49M6:/home$ touch output.txt
touch: cannot touch 'output.txt': Permission denied
cdac@LAPTOP-184M49M6:/home$ sudo touch output.txt
cdac@LAPTOP-184M49M6:/home$ ls
cdac    input.txt    linuxAssignment.zip  output.txt
data.txt linuxAssignment numbers.txt          user2
cdac@LAPTOP-184M49M6:/home$ chmod a+wx output.txt
chmod: changing permissions of 'output.txt': Operation not permitted
cdac@LAPTOP-184M49M6:/home$ sudo chmod a+wx output.txt
cdac@LAPTOP-184M49M6:/home$ ls -l
total 28
drwxr-x--- 9 cdac cdac 4096 Aug 31 18:42 cdac
-rw-r--r-- 1 root root 833 Aug 30 20:29 data.txt
-rw-r--r-- 1 root root 15 Aug 31 19:15 input.txt
drwxr-xr-x 4 root root 4096 Aug 30 15:32 linuxAssignment
-rw-r--r-- 1 root root 1106 Aug 30 14:59 linuxAssignment.zip
-rw-r--r-- 1 root root 252 Aug 31 19:10 numbers.txt
-rwxrwxrwx 1 root root 0 Aug 31 19:18 output.txt
drwxr-x--- 2 user2 user2 4096 Aug 28 09:49 user2
cdac@LAPTOP-184M49M6:/home$ sudo tr '[:lower:]' '[:upper:]' < input.txt > output.txt
cdac@LAPTOP-184M49M6:/home$ cat output.txt
PRIYANKA BOLAJ
cdac@LAPTOP-184M49M6:/home$ |
```

- f. In a file named "duplicate.txt," there are several lines of text, some of which are duplicates. Use a command to display only the unique lines from "duplicate.txt."

```
cdac@LAPTOP-184M49M6:/home$ sudo nano duplicate.txt
cdac@LAPTOP-184M49M6:/home$ cat duplicate.txt
Priya
Priya
Bolaj
Bolaj
Priyanka
Prathamesh
Neha
Milind
Milind
cdac@LAPTOP-184M49M6:/home$ sort duplicate.txt
Bolaj
Bolaj
Milind
Milind
Neha
Prathamesh
Priya
Priya
Priyanka
cdac@LAPTOP-184M49M6:/home$ uniq duplicate.txt
Priya
Bolaj
Priyanka
Prathamesh
Neha
Milind
cdac@LAPTOP-184M49M6:/home$ |
```

- g. In a file named "fruit.txt," there is a list of fruits, but some fruits are repeated. Use a command to display each unique fruit along with the count of its occurrences in "fruit.txt."

```
cdac@LAPTOP-184M49M6:/home$ sudo nano fruit.txt
cdac@LAPTOP-184M49M6:/home$ cat fruit.txt
Apple
Banana
Apple
Jackfruit
Apple
Banana
cdac@LAPTOP-184M49M6:/home$ uniq -c fruit.txt
      1 Apple
      1 Banana
      1 Apple
      1 Jackfruit
      1 Apple
      1 Banana
cdac@LAPTOP-184M49M6:/home$ sort fruit.txt | uniq -c
      3 Apple
      2 Banana
      1 Jackfruit
cdac@LAPTOP-184M49M6:/home$ |
```