

Assignment 1

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@DESKTOP-MUSUDSF:~$ cd
cdac@DESKTOP-MUSUDSF:~$ ls
cdac@DESKTOP-MUSUDSF:~$ mkdir LinuxAssignment
cdac@DESKTOP-MUSUDSF:~$ ls
LinuxAssignment
cdac@DESKTOP-MUSUDSF:~$ cd LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ |
```

b) File Management:

a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.

```
cdac@DESKTOP-MUSUDSF:~$ cd LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ cat file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ cat file1.txt
Hello World
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$
```

c) Directory Management:

- a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

```
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ |
```

d) Copy and Move Files:

- a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".

```
cdac@DESKTOP-MUSUDSF:~$ cd LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ cp file1.txt docs
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ cd docs
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls
file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ |
```

cp (Copy Command):

- Used to copy files and directories from one location to another.
- Example: `cp file1.txt docs/` copies file1.txt to the docs directory.

mv (Move Command):

- Used to move or rename files and directories.
- Example: `mv docs/file1.txt docs/file2.txt` renames file1.txt to file2.txt in the docs directory.

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.

```
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ pwd
/home/cdac/LinuxAssignment/docs
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ chmod u=rwx,g=r,o=r file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ chown $USER file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 12 Feb 26 18:31 file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ chmod 742 file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr---w- 1 cdac cdac 12 Feb 26 18:31 file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ |
```

chmod 744: Sets permissions as follows:

- Owner: Read, Write, Execute (7)
- Group: Read (4)
- Others: Read (4)

chown \$USER: Changes the owner to the current user.

Challenge: Required sudo privileges for chown.

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@DESKTOP-MUSUDSF:~$ cd LinuxAssignment
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ cd docs
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ ls /
bin          home          lost+found   root          srv
bin.usr-is-merged  init          media        run           sys
boot         lib           mnt          sbin          tmp
dev          lib.usr-is-merged  opt          sbin.usr-is-merged  usr
etc          lib64         proc         snap          var
cdac@DESKTOP-MUSUDSF:~/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 filename and the specific word to search).

```
cdac@DESKTOP-MUSUDSF: ~  
cdac@DESKTOP-MUSUDSF:~$ pwd  
/home/cdac  
cdac@DESKTOP-MUSUDSF:~$ find . -name "*.txt"  
./LinuxAssignment/file1.txt  
./LinuxAssignment/docs/file2.txt  
cdac@DESKTOP-MUSUDSF:~$ ls  
LinuxAssignment  
cdac@DESKTOP-MUSUDSF:~$ cd LinuxAssignment  
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$ grep 'cdac' file1.txt  
Iam a student at cdac mumbai  
doing dac at cdac  
cdac@DESKTOP-MUSUDSF:~/LinuxAssignment$
```

h) System Information:

- a. Display the current system date and time.

```
cdac@DESKTOP-SAITEJA: ~  
cdac@DESKTOP-SAITEJA:~$ pwd  
/home/cdac  
cdac@DESKTOP-SAITEJA:~$ date  
Thu Feb 27 16:00:41 UTC 2025  
cdac@DESKTOP-SAITEJA:~$
```

i) Networking:

- Display the IP address of the system.
- Ping a remote server to check connectivity (provide a remote server address to ping).

```
cdac@DESKTOP-SAITEJA: ~  
cdac@DESKTOP-SAITEJA:~$ pwd  
/home/cdac  
cdac@DESKTOP-SAITEJA:~$ ip a  
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 1400 qdisc mq state UP group default qlen 1000  
    link/ether 00:15:5d:cd:e4:55 brd ff:ff:ff:ff:ff:ff  
    inet 172.19.215.165/20 brd 172.19.223.255 scope global eth0  
        valid_lft forever preferred_lft forever  
    inet6 fe80::215:5dff:fed:e455/64 scope link  
        valid_lft forever preferred_lft forever  
cdac@DESKTOP-SAITEJA:~$ ping -c 3 google.com  
PING google.com (142.250.206.142) 56(84) bytes of data.  
64 bytes from dell1s21-in-f14.1e100.net (142.250.206.142): icmp_seq=1 ttl=110 time=151 ms  
64 bytes from dell1s21-in-f14.1e100.net (142.250.206.142): icmp_seq=2 ttl=110 time=68.9 ms  
64 bytes from dell1s21-in-f14.1e100.net (142.250.206.142): icmp_seq=3 ttl=110 time=66.9 ms  
--- google.com ping statistics ---  
3 packets transmitted, 3 received, 0% packet loss, time 2003ms  
rtt min/avg/max/mdev = 66.882/95.503/150.685/39.028 ms  
cdac@DESKTOP-SAITEJA:~$ |
```

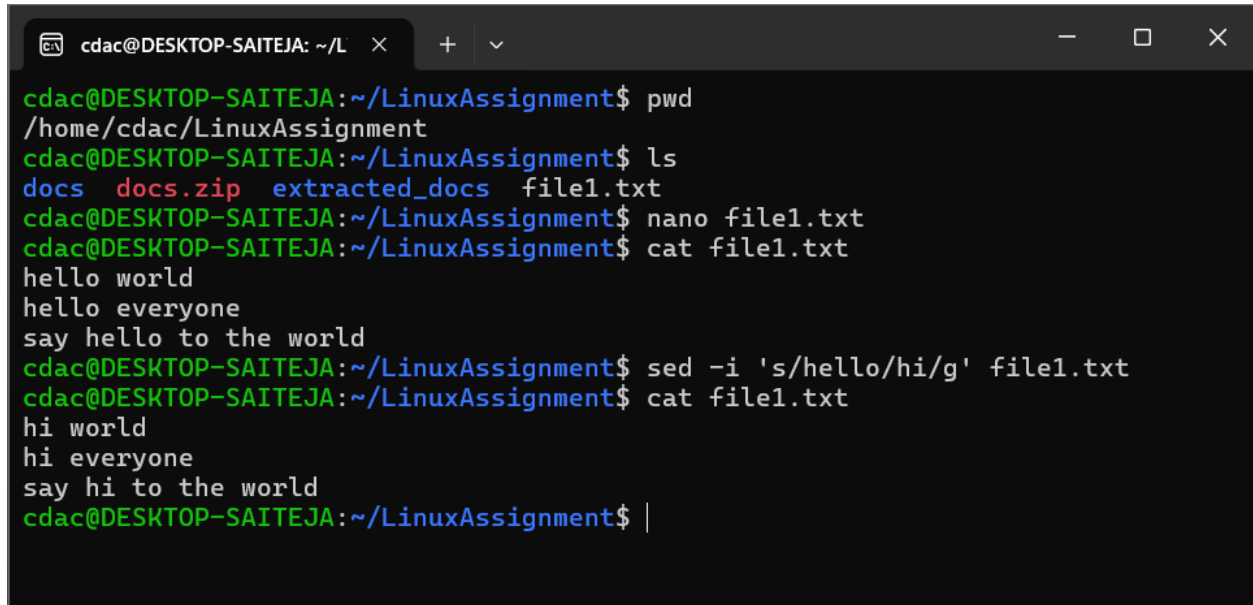
j) File Compression:

- Compress the "docs" directory into a zip file.
- Extract the contents of the zip file into a new directory.

```
cdac@DESKTOP-SAITEJA:~$ ls  
LinuxAssignment  
cdac@DESKTOP-SAITEJA:~$ cd LinuxAssignment  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ zip -r docs.zip docs  
  adding: docs/ (stored 0%)  
  adding: docs/file2.txt (stored 0%)  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls  
docs docs.zip file1.txt  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ mkdir extracted_docs  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls  
docs docs.zip extracted_docs file1.txt  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ unzip docs.zip -d extracted_docs  
Archive: docs.zip  
  creating: extracted_docs/docs/  
  extracting: extracted_docs/docs/file2.txt  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls  
docs docs.zip extracted_docs file1.txt  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ |
```

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).

A terminal window titled 'cdac@DESKTOP-SAITEJA: ~/LinuxAssignment' with standard window controls. It shows a sequence of commands and their outputs: 'pwd' returns '/home/cdac/LinuxAssignment'; 'ls' lists 'docs', 'docs.zip', 'extracted_docs', and 'file1.txt'; 'nano file1.txt' is executed; 'cat file1.txt' shows 'hello world', 'hello everyone', and 'say hello to the world'; 'sed -i 's/hello/hi/g' file1.txt' is executed; a second 'cat file1.txt' shows 'hi world', 'hi everyone', and 'say hi to the world'.

```
cdac@DESKTOP-SAITEJA: ~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
docs  docs.zip  extracted_docs  file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat file1.txt
hello world
hello everyone
say hello to the world
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ sed -i 's/hello/hi/g' file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat file1.txt
hi world
hi everyone
say hi to the world
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ |
```

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

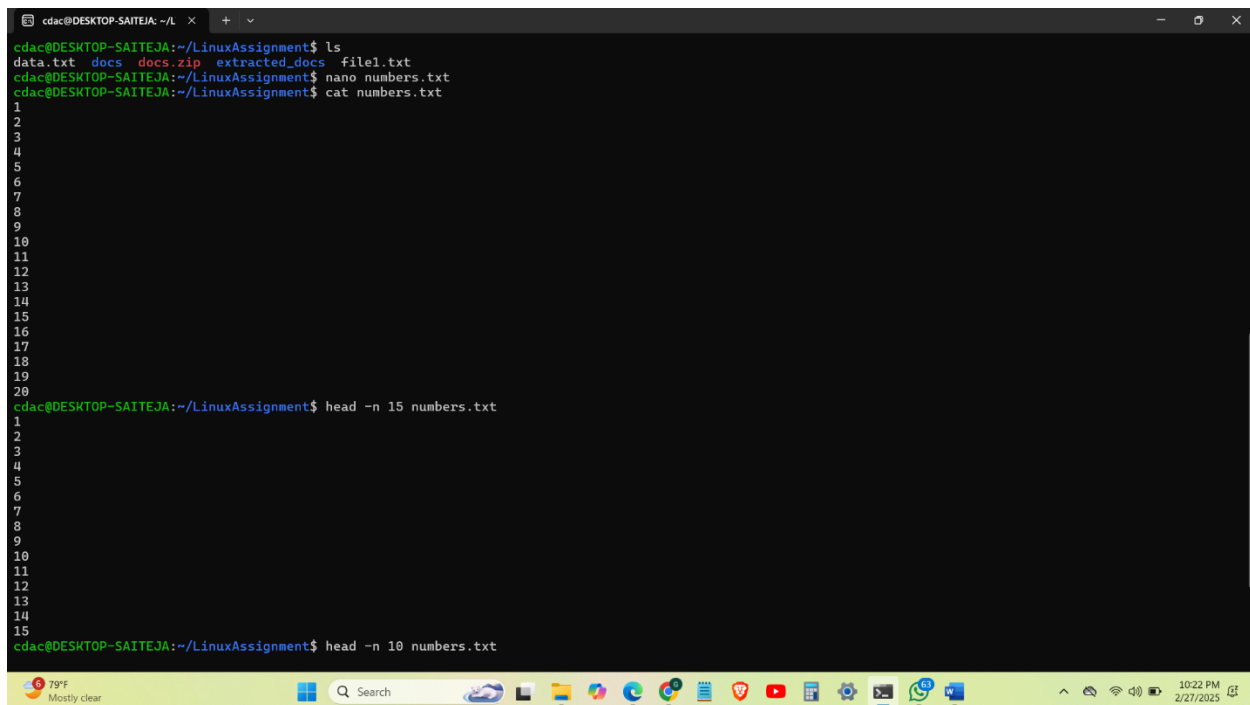
a. Suppose you have a file named "data.txt" containing important information. Display the first 10 lines of this file to quickly glance at its contents using a command.

```
cdac@DESKTOP-SAITEJA: ~/L × + v
cdac@DESKTOP-SAITEJA:~$ pwd
/home/cdac
cdac@DESKTOP-SAITEJA:~$ ls
LinuxAssignment
cdac@DESKTOP-SAITEJA:~$ cd LinuxAssignment
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
docs docs.zip extracted_docs file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ touch data.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs docs.zip extracted_docs file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ nano data.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs docs.zip extracted_docs file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat file.txt
cat: file.txt: No such file or directory
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat data.txt
Welcome
to
the
world
of
Linux
shell
commands
and
scripting
Have
fun!
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ head -n 10 data.txt
Welcome
to
the
world
of
Linux
shell
commands
and
scripting
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ |
```

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@DESKTOP-SAITEJA:~/LinuxAssignment$ tail -n 5 data.txt
commands
and
scripting
Have
fun!
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ |
```

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.

A terminal window titled 'cdac@DESKTOP-SAITEJA: ~/LinuxAssignment' showing a series of commands and their outputs. The commands include 'ls', 'nano numbers.txt', 'cat numbers.txt', 'head -n 15 numbers.txt', and 'head -n 10 numbers.txt'. The output of 'cat numbers.txt' shows a list of numbers from 1 to 20. The 'head' commands display the first 15 and then the first 10 lines of the file. The terminal window is overlaid on a Windows desktop with a taskbar at the bottom showing various application icons and system status information like temperature and time.

```
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt  docs  docs.zip  extracted_docs  file1.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ nano numbers.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ head -n 10 numbers.txt
1
2
3
4
5
6
7
8
9
10
```

d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".

```
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ tail -n 3 numbers.txt
18
19
20
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$
```


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@DESKTOP-SAITEJA: ~/L × + v
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs docs.zip extracted_docs file1.txt numbers.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ nano input.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs docs.zip extracted_docs file1.txt input.txt numbers.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat input.txt
hello world
this is a test
linux commands are powerful
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat input.txt | tr 'a-z' 'A-Z' > output.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs.zip file1.txt numbers.txt
docs extracted_docs input.txt output.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat input.txt
hello world
this is a test
linux commands are powerful
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat output.txt
HELLO WORLD
THIS IS A TEST
LINUX COMMANDS ARE POWERFUL
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ |
```

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@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs.zip file1.txt numbers.txt
docs extracted_docs input.txt output.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ nano duplicate.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ ls
data.txt docs.zip extracted_docs input.txt output.txt
docs duplicate.txt file1.txt numbers.txt
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat duplicate.txt
apple
banana
apple
orange
banana
apple
grape
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ sort duplicate.txt | uniq
apple
banana
grape
orange
```

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@DESKTOP-SAITEJA: ~/L × + ▾  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ pwd  
/home/cdac/LinuxAssignment  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ nano fruit.txt  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ cat fruit.txt  
apple  
banana  
apple  
orange  
banana  
apple  
grape  
orange  
orange  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ sort fruit.txt | uniq -c  
  3 apple  
  2 banana  
  1 grape  
  3 orange  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ sort fruit.txt | uniq -c | sort -nr  
  3 orange  
  3 apple  
  2 banana  
  1 grape  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ sort fruit.txt | uniq -c | sort -n  
  1 grape  
  2 banana  
  3 apple  
  3 orange  
cdac@DESKTOP-SAITEJA:~/LinuxAssignment$ |
```

Challenges Encountered:

1. Permission Problems: Experienced permission problems using chown. Solution: Used sudo.
2. Case Sensitivity in Searching: grep is case-sensitive. Solution: Used grep -i for case-insensitive searching.
3. Network Commands: The ifconfig could not be traced in my machine. Solution: ip a used instead or accessed using sudo.