CDAC MUMBAI

Concepts of Operating System Assignment 1

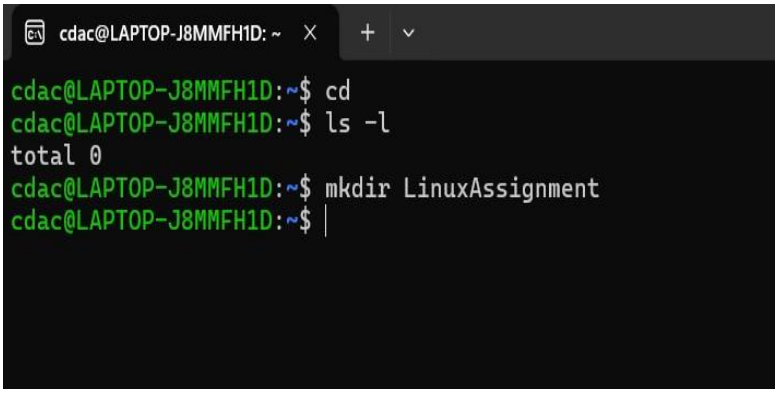
Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

a) Navigate and List:

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

Ans:

cdac@LAPTOP-J8MMFH1D:~$ cd
cdac@LAPTOP-J8MMFH1D:~$ ls -l
total 0
cdac@LAPTOP-J8MMFH1D:~$ mkdir LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~$



b) File Management:

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

Ans:

cdac@LAPTOP-J8MMFH1D:~$ mkdir LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~$ cd LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ touch file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ cat file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ cat file1.txt
Hello
My name is Sumit Deshmukh
I am persuing CDAC

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$

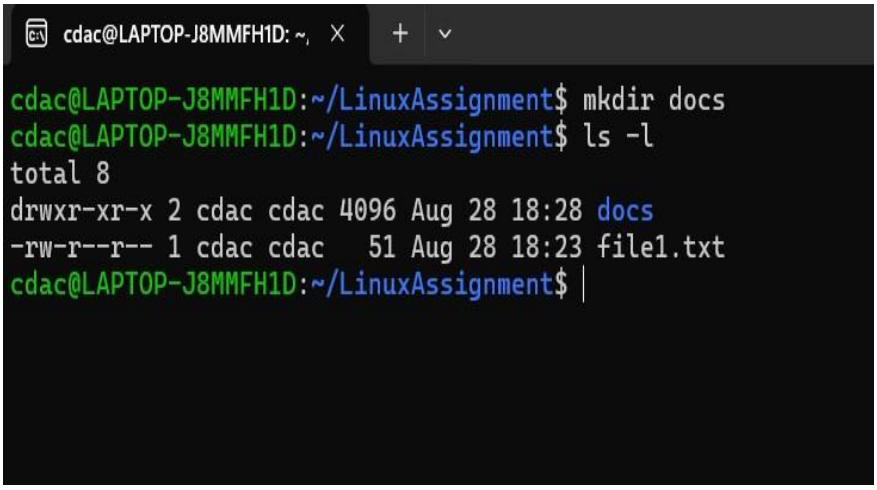
```
cdac@LAPTOP-J8MMFH1D:~$ mkdir LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~$ cd LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ touch file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ cat file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ cat file1.txt
Hello
My name is Sumit Deshmukh
I am persuing CDAC
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$
```

c) Directory Management:

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

Ans:

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ mkdir docs
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:28 docs
-rw-r--r-- 1 cdac cdac 51 Aug 28 18:23 file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$



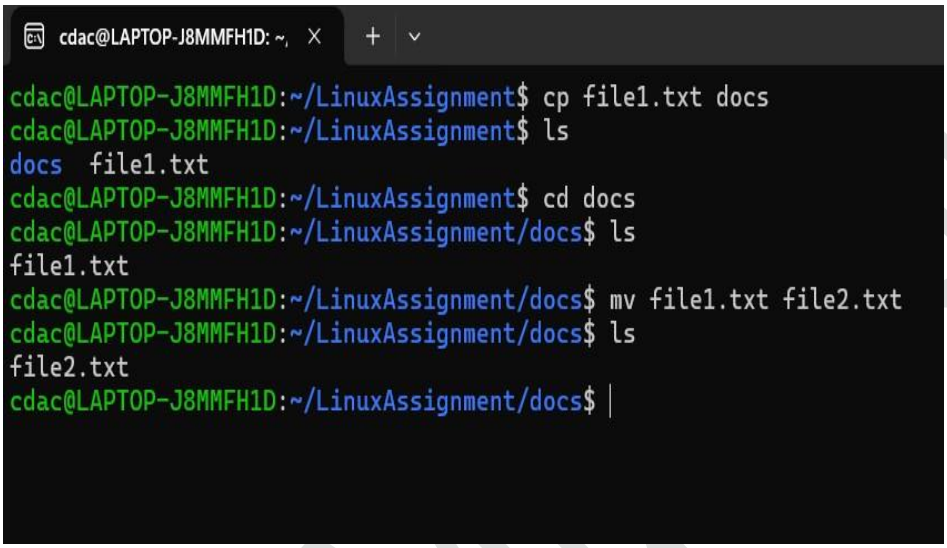
d) Copy and Move Files:

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

Ans:

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ cp file1.txt docs
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ ls
docs file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ cd docs
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ ls
file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ ls
file2.txt

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$



e) Permissions and Ownership:

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.

Ans:

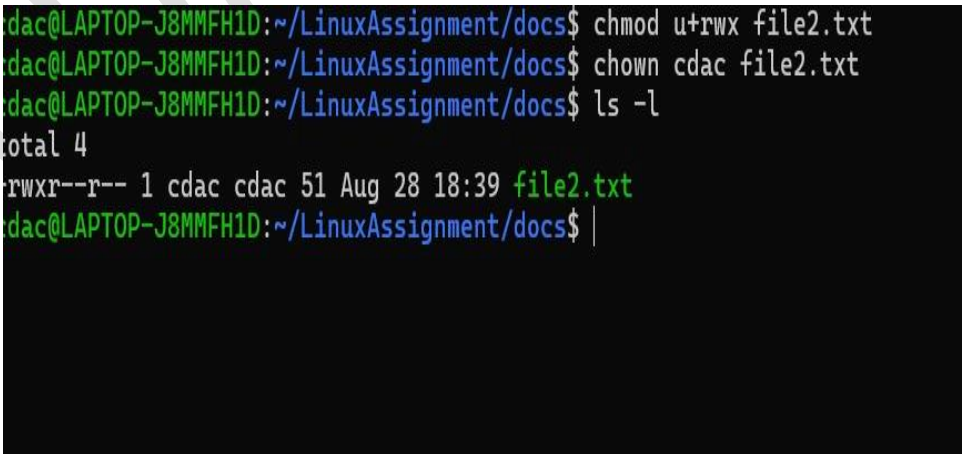
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ chmod u+rwx file2.txt

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ chown cdac file2.txt

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ ls -l

total 4

-rwxr--r-- 1 cdac cdac 51 Aug 28 18:39 file2.txt



f) Final Checklist:

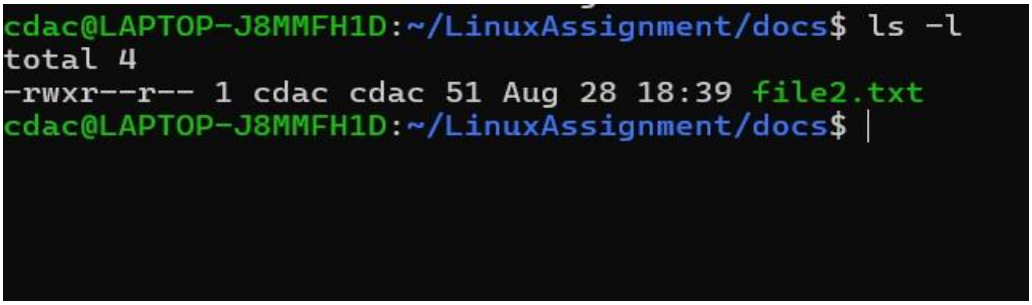
Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

Ans:

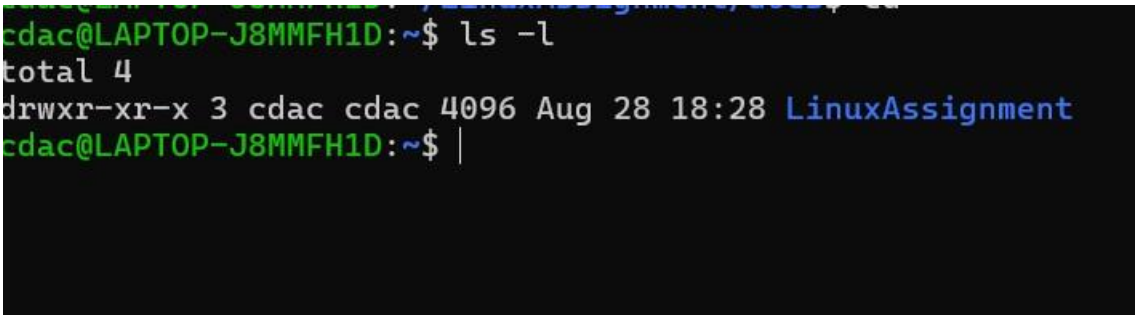
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ ls -l

total 4

-rwxr--r-- 1 cdac cdac 51 Aug 28 18:39 file2.txt



cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment/docs$ cd
cdac@LAPTOP-J8MMFH1D:~$ ls -l
total 4
drwxr-xr-x 3 cdac cdac 4096 Aug 28 18:28 LinuxAssignment

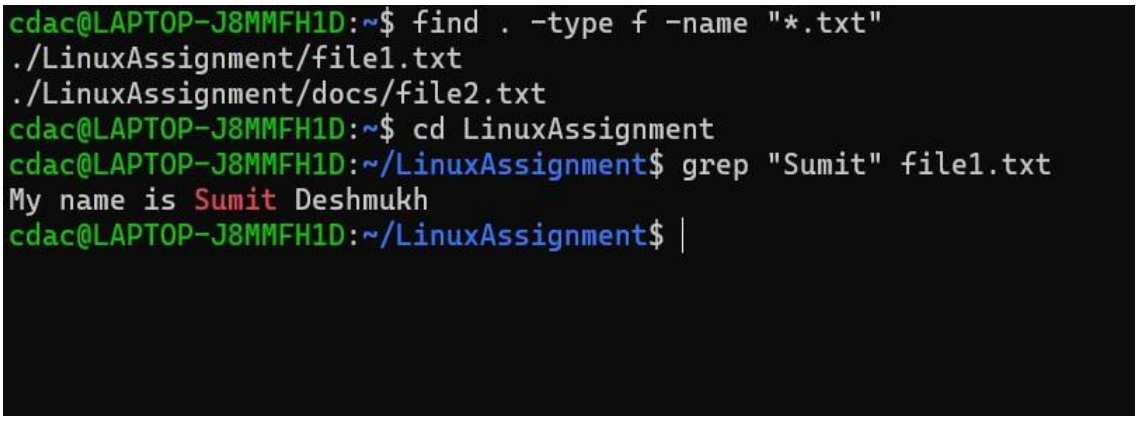


g) File Searching:

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

Ans:

cdac@LAPTOP-J8MMFH1D:~$ find . -type f -name "*.txt"
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file2.txt
cdac@LAPTOP-J8MMFH1D:~$ cd LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ grep "Sumit" file1.txt
My name is Sumit Deshmukh
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$

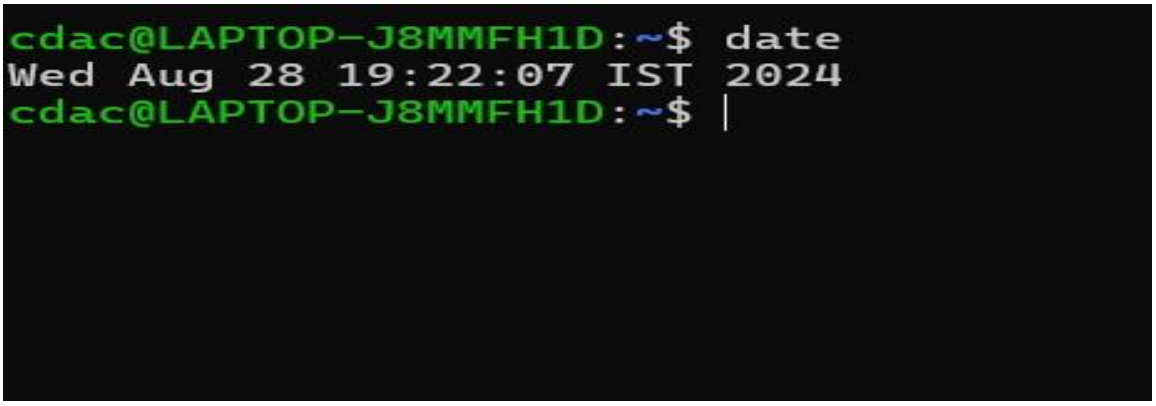


h) System Information:

Display the current system date and time.

Ans:

cdac@LAPTOP-J8MMFH1D:~$ date
Wed Aug 28 19:22:07 IST 2024



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). j) File Compression:

a. Compress the "docs" directory into a zip file.

Extract the contents of the zip file into a new directory.

Ans:

```
cdac@LAPTOP-J8MMFH1D:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.25.76.95  netmask 255.255.240.0  broadcast 172.25.79.255
        inet6 fe80::215:5dff:fea5:e540  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:a5:e5:40  txqueuelen 1000  (Ethernet)
        RX packets 54231  bytes 102912624 (102.9 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 26301  bytes 2196717 (2.1 MB)
        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 104  bytes 10385 (10.3 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 104  bytes 10385 (10.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

cdac@LAPTOP-J8MMFH1D:~$ ping google.com
PING google.com (142.250.199.142) 56(84) bytes of data.
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=1 ttl=59
time=6.03 ms
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=2 ttl=59
time=8.01 ms
^C
--- google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 6.030/7.019/8.008/0.989 ms
cdac@LAPTOP-J8MMFH1D:~$ cd LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ zip -r name_of_zip_file.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
```

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ mkdir newdirectory
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ unzip name_of_zip_file.zip -d new_directory
Archive: name_of_zip_file.zip
creating: new_directory/docs/
extracting: new_directory/docs/file2.txt

```
cdac@LAPTOP-J8MMFH1D:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.25.76.95  netmask 255.255.240.0  broadcast 172.25.79.255
        inet6 fe80::215:5dff:fea5:e540  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:a5:e5:40  txqueuelen 1000  (Ethernet)
        RX packets 54231  bytes 102912624 (102.9 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 26301  bytes 2196717 (2.1 MB)
        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 104  bytes 10385 (10.3 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 104  bytes 10385 (10.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

cdac@LAPTOP-J8MMFH1D:~$ ping google.com
PING google.com (142.250.199.142) 56(84) bytes of data.
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=1 ttl=59 time=6.03 ms
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=2 ttl=59 time=8.01 ms
^C
--- google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 6.030/7.019/8.008/0.989 ms
cdac@LAPTOP-J8MMFH1D:~$ zip -r name_of_zip_file.zip docs
        zip warning: name not matched: docs

zip error: Nothing to do! (try: zip -r name_of_zip_file.zip . -i docs)
cdac@LAPTOP-J8MMFH1D:~$ cd LinuxAssignment
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ zip -r name_of_zip_file.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ mkdir newdirectory
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ unzip name_of_zip_file.zip -d new_directory
Archive:  name_of_zip_file.zip
   creating: new_directory/docs/
 extracting: new_directory/docs/file2.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$
```

k) File Editing:

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

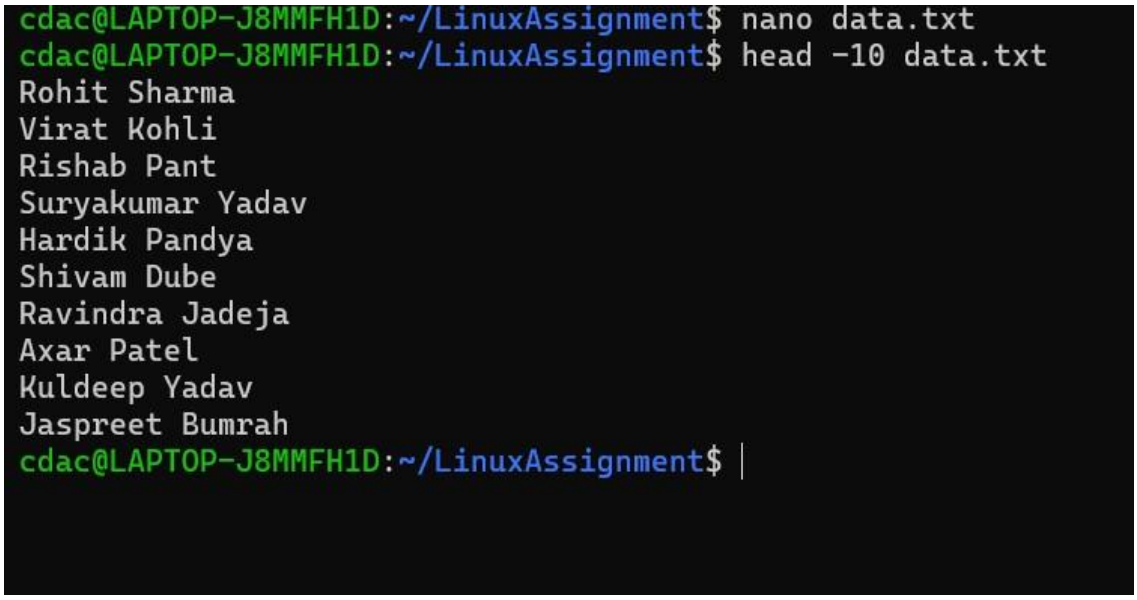
Ans:

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ sed -i 's/Sumit/Virat/g' file1.txt

```
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ sed -i 's/Sumit/Virat/g' file1.txt
```

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.
Ans:
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano data.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ head -10 data.txt
Rohit Sharma
Virat Kohli
Rishab Pant
Suryakumar Yadav
Hardik Pandya
Shivam Dube
Ravindra Jadeja
Axar Patel
Kuldeep Yadav
Jaspreet Bumrah



b. Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.
Ans:
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ tail -5 data.txt
Kuldeep Yadav
Jaspreet Bumrah
Arshdeep Singh
MD Siraj

Yuzi Chahal

```
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ tail -5 data.txt
Kuldeep Yadav
Jaspreet Bumrah
Arshdeep Singh
MD Siraj
Yuzi Chahal
cdac@LAPTOP-J8MMFH1D:~/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.

Ans:

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano numbers.txt

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ head -15 numbers.txt

1
2
3
4
5
6
7
8
9
10
11
12
13
14

15

```
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano numbers.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$
```

d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".
Ans:
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ tail -3 numbers.txt
16
17
18

```
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ tail -3 numbers.txt
16
17
18
cdac@LAPTOP-J8MMFH1D:~/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."
Ans:
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano input.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ touch output.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano output.txt

```
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano input.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ touch output.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano output.txt
```

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."

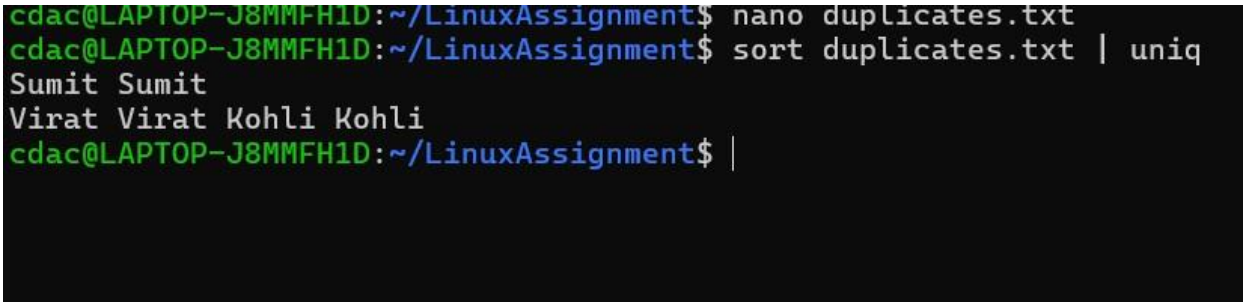
Ans:

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano duplicates.txt

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ sort duplicates.txt | uniq

Sumit Sumit

Virat Virat Kohli Kohli



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."

Ans:

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ nano fruits.txt

cdac@LAPTOP-J8MMFH1D:~/LinuxAssignment$ sort fruits.txt | uniq -c

3 apple

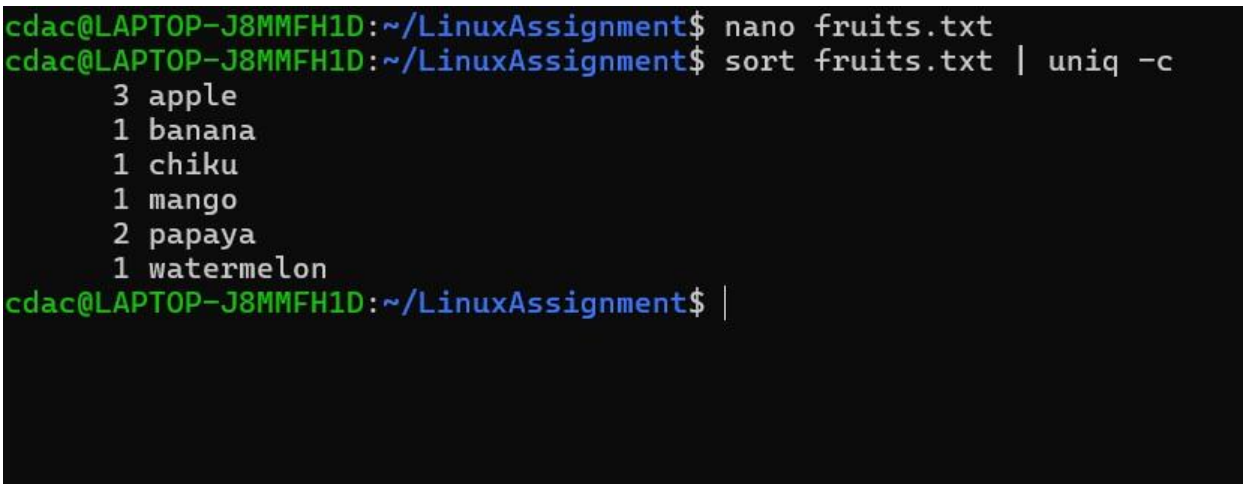
1 banana

1 chiku

1 mango

2 papaya

1 watermelon



Submission Guidelines:

- Document each step of your solution and any challenges faced.
- Upload it on your GitHub repository

Additional Tips:

- Experiment with different options and parameters of each command to explore their functionalities.