

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:

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.

```
Deci_Lps feb25 lp1
root@DESKTOP-2UVI7R7:~# cd feb25/
root@DESKTOP-2UVI7R7:~/feb25# cd --
root@DESKTOP-2UVI7R7:~# ls
Deci_Lps feb25 lp1
root@DESKTOP-2UVI7R7:~# mkdir Linux_Assignment
root@DESKTOP-2UVI7R7:~# cd Linux_Assignment/
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

b) File Management:

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

```
root@DESKTOP-2UVI7R7:~# mkdir Linux_Assignment
root@DESKTOP-2UVI7R7:~# cd Linux_Assignment/
root@DESKTOP-2UVI7R7:~/Linux_Assignment# touch file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

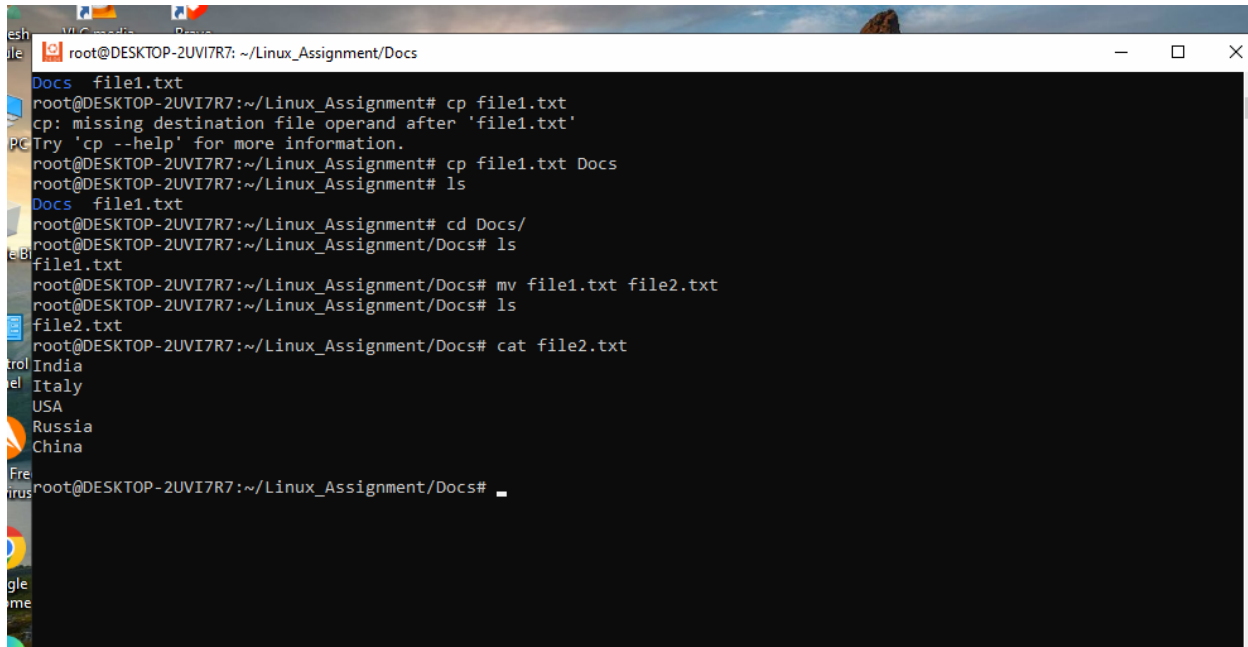
c) Directory Management:

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

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment# pwd
/root/Linux_Assignment
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# mkdir Docs/
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

d) Copy and Move Files:

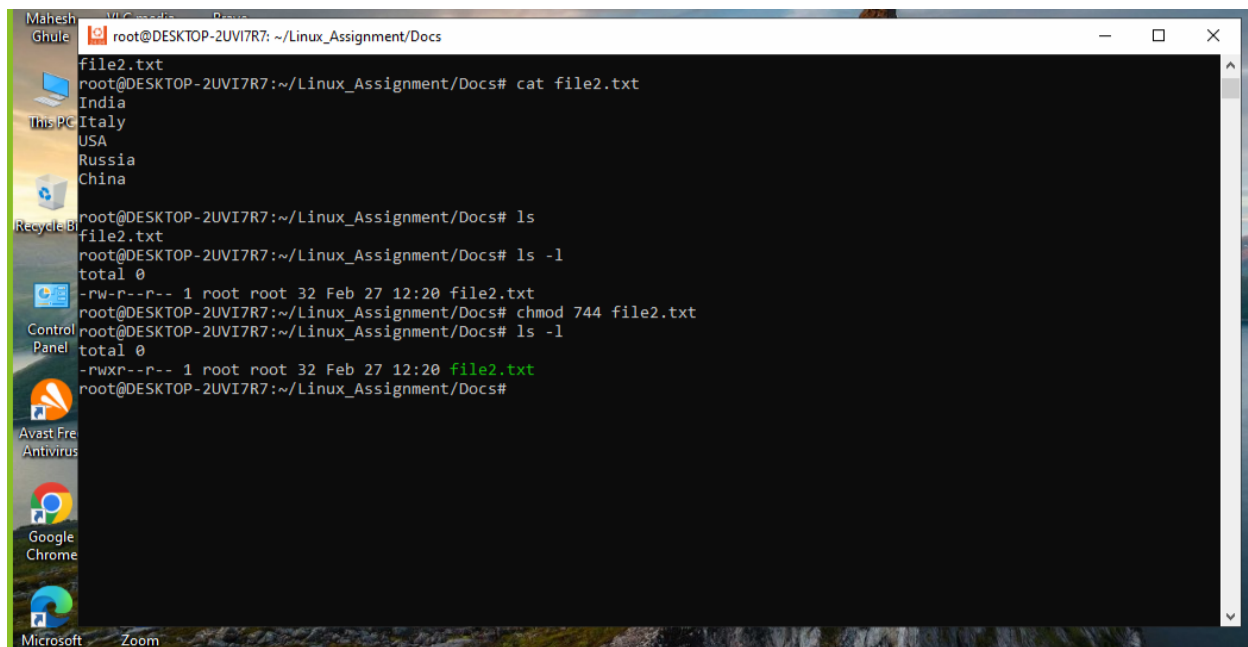
- Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".

A terminal window titled 'root@DESKTOP-2UVI7R7: ~/Linux_Assignment/Docs' showing a series of commands and their outputs. The user attempts to copy 'file1.txt' to the current directory, fails with an error, then successfully copies it to the 'Docs' subdirectory. They then list the contents of 'Docs', move 'file1.txt' to 'file2.txt', list the directory again to confirm, and finally view the contents of 'file2.txt' which lists several countries.

```
root@DESKTOP-2UVI7R7: ~/Linux_Assignment/Docs
Docs file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cp file1.txt
cp: missing destination file operand after 'file1.txt'
Try 'cp --help' for more information.
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cp file1.txt Docs
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cd Docs/
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls
file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# mv file1.txt file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls
file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# cat file2.txt
India
Italy
USA
Russia
China
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs#
```

e) Permissions and Ownership:

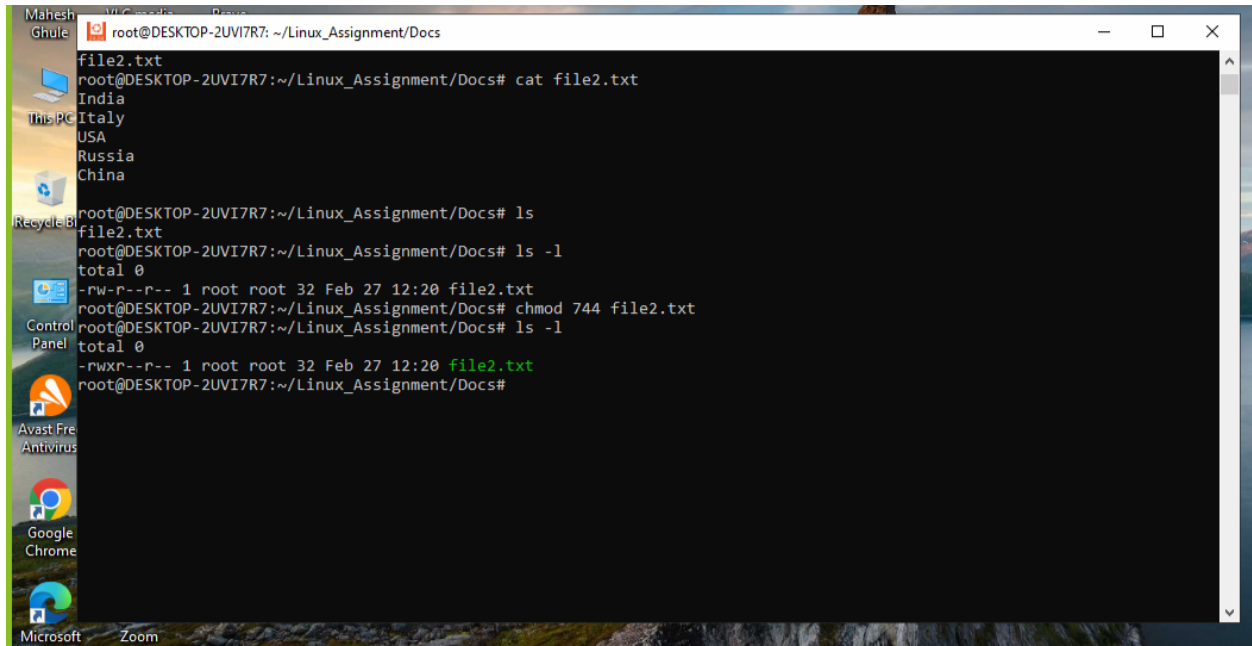
- Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others. Then, change the owner of "file2.txt" to the current user.

A terminal window titled 'root@DESKTOP-2UVI7R7: ~/Linux_Assignment/Docs' showing commands to view file details, change permissions with 'chmod', and change ownership with 'chown'. The output shows the file's metadata and the updated permissions and owner.

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# cat file2.txt
India
Italy
USA
Russia
China
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls
file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls -l
total 0
-rw-r--r-- 1 root root 32 Feb 27 12:20 file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# chmod 744 file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls -l
total 0
-rwxr--r-- 1 root root 32 Feb 27 12:20 file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs#
```

f) Final Checklist:

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



The screenshot shows a terminal window titled "root@DESKTOP-2UVI7R7: ~/Linux_Assignment/Docs". The user is in the root directory of a virtual machine. The terminal shows the following commands and output:

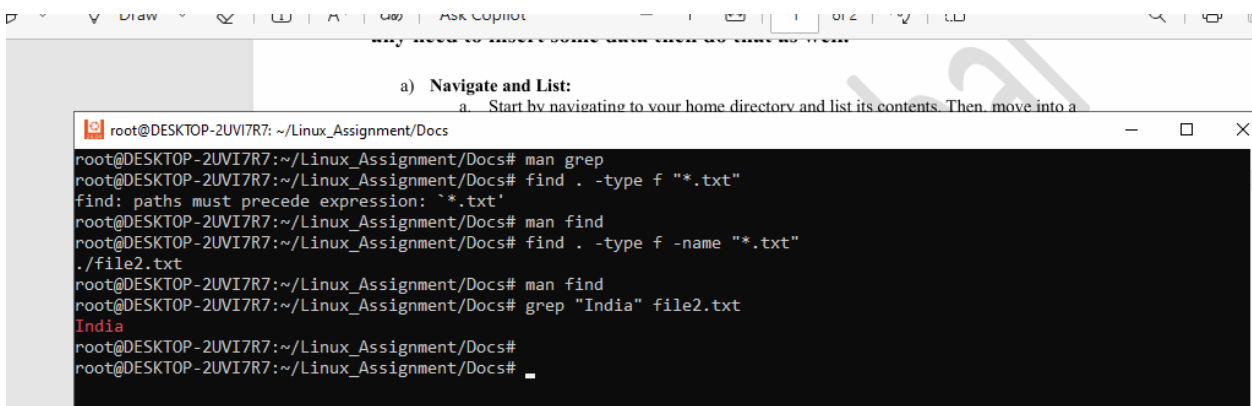
```
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# cat file2.txt
India
This PC Italy
USA
Russia
China

root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls
file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls -l
total 0
-rw-r--r-- 1 root root 32 Feb 27 12:20 file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# chmod 744 file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ls -l
total 0
-rwxr--r-- 1 root root 32 Feb 27 12:20 file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs#
```

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).



The screenshot shows a terminal window titled "root@DESKTOP-2UVI7R7: ~/Linux_Assignment/Docs". The user is in the root directory of a virtual machine. The terminal shows the following commands and output:

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# man grep
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# find . -type f "*.txt"
find: paths must precede expression: '*.txt'
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# man find
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# find . -type f -name "*.txt"
./file2.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# man find
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# grep "India" file2.txt
India
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs#
```

h) System Information:

a. Display the current system date and time.

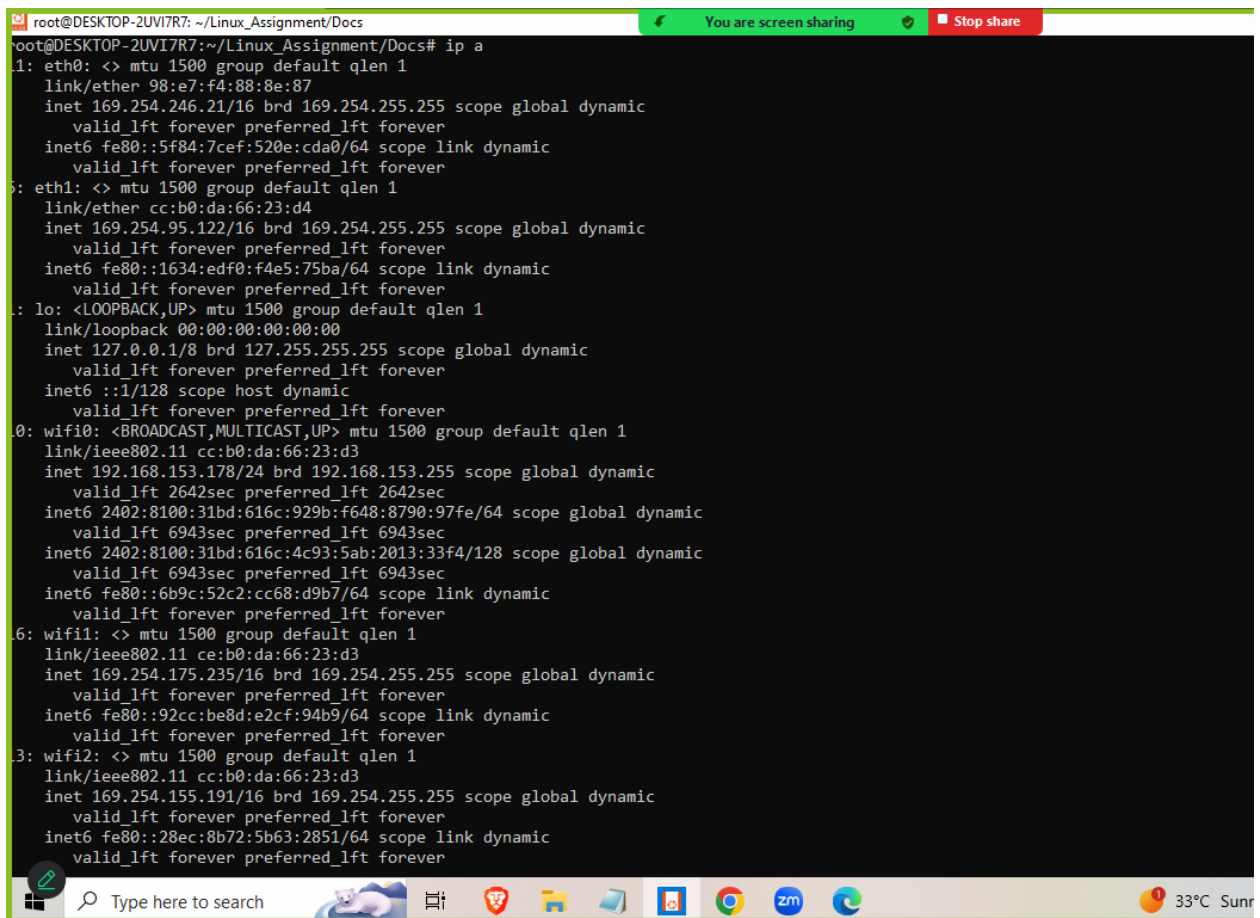
```
root@DESKTOP-2UVI7R7:~/Linux_Assignment# date
```

Thu Feb 27 16:06:24 UTC 2025

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

i) Networking:

a. Display the IP address of the system.



```
root@DESKTOP-2UVI7R7: ~/Linux_Assignment/Docs
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# ip a
1: eth0: <> mtu 1500 group default qlen 1
    link/ether 98:e7:f4:88:8e:87
    inet 169.254.246.21/16 brd 169.254.255.255 scope global dynamic
        valid_lft forever preferred_lft forever
    inet6 fe80::5f84:7cef:520e:cda0/64 scope link dynamic
        valid_lft forever preferred_lft forever
2: eth1: <> mtu 1500 group default qlen 1
    link/ether cc:b0:da:66:23:d4
    inet 169.254.95.122/16 brd 169.254.255.255 scope global dynamic
        valid_lft forever preferred_lft forever
    inet6 fe80::1634:edf0:f4e5:75ba/64 scope link dynamic
        valid_lft forever preferred_lft forever
3: lo: <LOOPBACK,UP> mtu 1500 group default qlen 1
    link/loopback 00:00:00:00:00:00
    inet 127.0.0.1/8 brd 127.255.255.255 scope global dynamic
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host dynamic
        valid_lft forever preferred_lft forever
4: wif10: <BROADCAST,MULTICAST,UP> mtu 1500 group default qlen 1
    link/ieee802.11 cc:b0:da:66:23:d3
    inet 192.168.153.178/24 brd 192.168.153.255 scope global dynamic
        valid_lft 2642sec preferred_lft 2642sec
    inet6 2402:8100:31bd:616c:929b:f648:8790:97fe/64 scope global dynamic
        valid_lft 6943sec preferred_lft 6943sec
    inet6 2402:8100:31bd:616c:4c93:5ab:2013:33f4/128 scope global dynamic
        valid_lft 6943sec preferred_lft 6943sec
    inet6 fe80::6b9c:52c2:cc68:d9b7/64 scope link dynamic
        valid_lft forever preferred_lft forever
5: wif11: <> mtu 1500 group default qlen 1
    link/ieee802.11 cc:b0:da:66:23:d3
    inet 169.254.175.235/16 brd 169.254.255.255 scope global dynamic
        valid_lft forever preferred_lft forever
    inet6 fe80::92cc:be8d:e2cf:94b9/64 scope link dynamic
        valid_lft forever preferred_lft forever
6: wif12: <> mtu 1500 group default qlen 1
    link/ieee802.11 cc:b0:da:66:23:d3
    inet 169.254.155.191/16 brd 169.254.255.255 scope global dynamic
        valid_lft forever preferred_lft forever
    inet6 fe80::28ec:8b72:5b63:2851/64 scope link dynamic
        valid_lft forever preferred_lft forever
```

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.

```
root@DESKTOP-2UVI7R7: ~/Linux_Assignment
a. Suppose you have a file named "data.txt" containing important information. Display the
root@DESKTOP-2UVI7R7:~/Linux_Assignment/Docs# cd --
root@DESKTOP-2UVI7R7:~# cd LinuxAssignment/
-bash: cd: LinuxAssignment/: No such file or directory
root@DESKTOP-2UVI7R7:~# cd Linux_Assignment/
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs data.txt file1.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cat data.txt
India
China
USA
Japan
Russia
Koria
Ukren
Pak
UK
Afganistan
Africa
root@DESKTOP-2UVI7R7:~/Linux_Assignment# _
```

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

```
Afganistan
root@DESKTOP-2UVI7R7:~/Linux_Assignment# tail -n 5 data.txt
Pak
UK
Afganistan
Africa
root@DESKTOP-2UVI7R7:~/Linux_Assignment# _
```

- 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.

```
root@DESKTOP-2UVI7R7: ~/Linux_Assignment
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs data.txt file1.txt numbers.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano
Docs/ data.txt file1.txt numbers.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano numbers.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs data.txt file1.txt numbers.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

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

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment# tail -n 3 numbers.txt
19
20

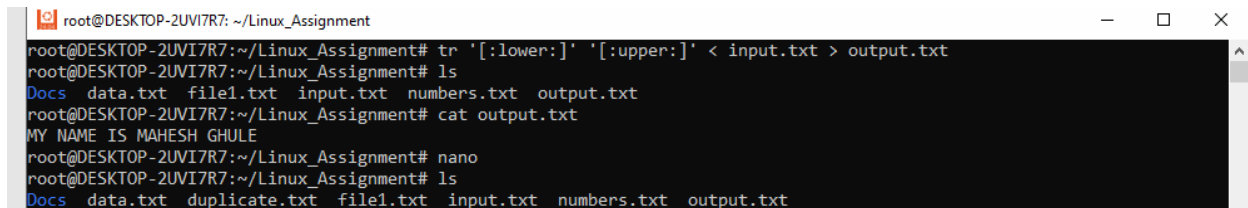
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano numbers.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# tail -n 3 numbers.txt
18
19
20
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

- 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."

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cat input.txt
```

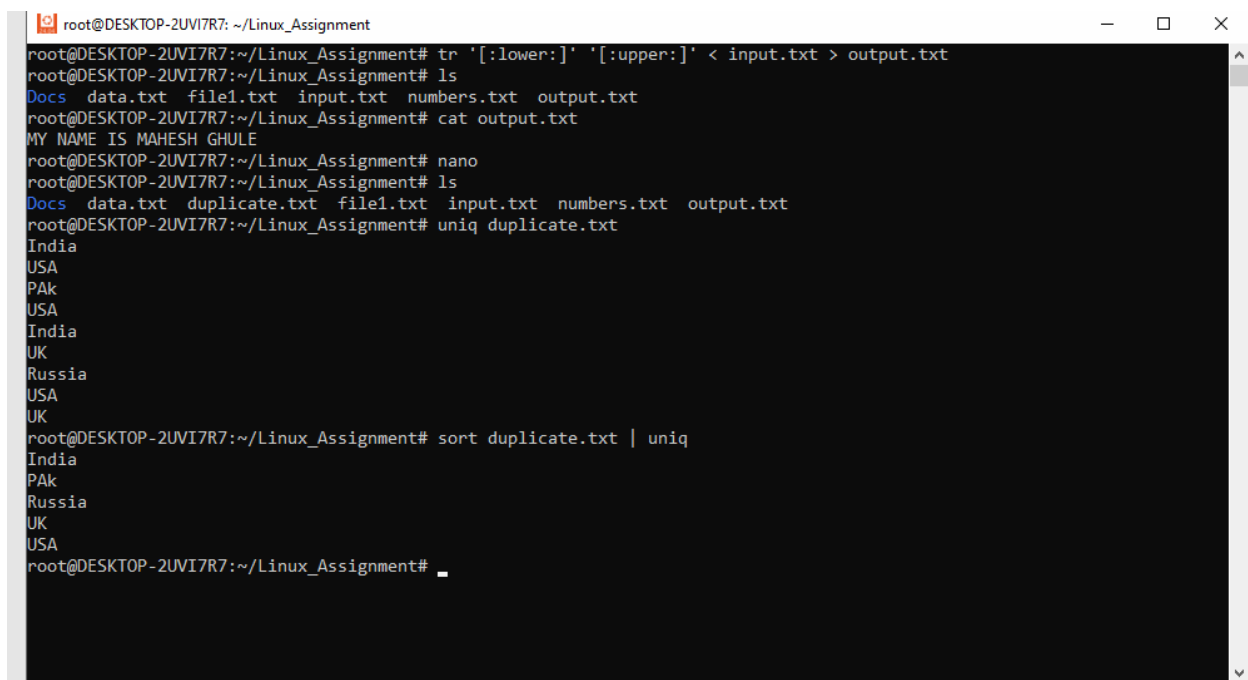
my name is mahesh ghule

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```



```
root@DESKTOP-2UVI7R7: ~/Linux_Assignment
root@DESKTOP-2UVI7R7:~/Linux_Assignment# tr '[:lower:]' '[:upper:]' < input.txt > output.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs  data.txt  file1.txt  input.txt  numbers.txt  output.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cat output.txt
MY NAME IS MAHESH GHULE
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs  data.txt  duplicate.txt  file1.txt  input.txt  numbers.txt  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."



```
root@DESKTOP-2UVI7R7: ~/Linux_Assignment
root@DESKTOP-2UVI7R7:~/Linux_Assignment# tr '[:lower:]' '[:upper:]' < input.txt > output.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs  data.txt  file1.txt  input.txt  numbers.txt  output.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cat output.txt
MY NAME IS MAHESH GHULE
root@DESKTOP-2UVI7R7:~/Linux_Assignment# nano
root@DESKTOP-2UVI7R7:~/Linux_Assignment# ls
Docs  data.txt  duplicate.txt  file1.txt  input.txt  numbers.txt  output.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# uniq duplicate.txt
India
USA
PAk
USA
India
UK
Russia
USA
UK
root@DESKTOP-2UVI7R7:~/Linux_Assignment# sort duplicate.txt | uniq
India
PAk
Russia
UK
USA
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```

- 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."

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment# la
Docs data.txt duplicate.txt file1.txt fruits.txt input.txt numbers.txt output.txt
root@DESKTOP-2UVI7R7:~/Linux_Assignment# cat fruits.txt
banana
watermelon
grapes
apple
grapes
papaya
watermelon
watermelon
papaya
```

```
root@DESKTOP-2UVI7R7:~/Linux_Assignment# sort fruits.txt | uniq -c
1
1 apple
1 banana
2 grapes
2 papaya
3 watermelon
root@DESKTOP-2UVI7R7:~/Linux_Assignment#
```