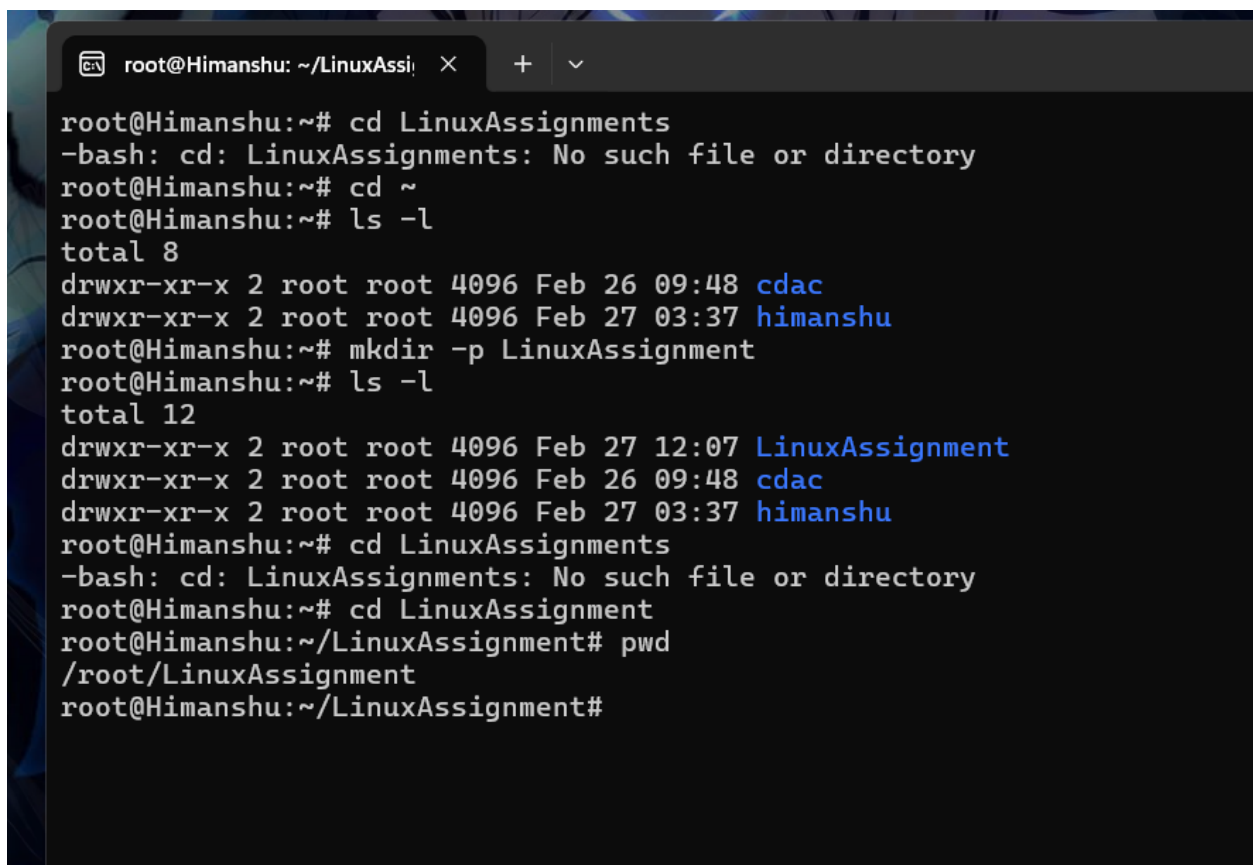


Assignment 1

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

- 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.

A terminal window with a dark background and light text. The window title bar shows 'root@Himanshu: ~/LinuxAssi' with a close button and a dropdown arrow. The terminal output shows a series of commands and their results. The user attempts to navigate to 'LinuxAssignments' but it doesn't exist. They then list the home directory, showing three files: 'cdac', 'himanshu', and 'LinuxAssignment'. They create 'LinuxAssignment' and list it again. Finally, they navigate into 'LinuxAssignment' and run 'pwd' to confirm the current directory.

```
root@Himanshu:~# cd LinuxAssignments
-bash: cd: LinuxAssignments: No such file or directory
root@Himanshu:~# cd ~
root@Himanshu:~# ls -l
total 8
drwxr-xr-x 2 root root 4096 Feb 26 09:48 cdac
drwxr-xr-x 2 root root 4096 Feb 27 03:37 himanshu
root@Himanshu:~# mkdir -p LinuxAssignment
root@Himanshu:~# ls -l
total 12
drwxr-xr-x 2 root root 4096 Feb 27 12:07 LinuxAssignment
drwxr-xr-x 2 root root 4096 Feb 26 09:48 cdac
drwxr-xr-x 2 root root 4096 Feb 27 03:37 himanshu
root@Himanshu:~# cd LinuxAssignments
-bash: cd: LinuxAssignments: No such file or directory
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# pwd
/root/LinuxAssignment
root@Himanshu:~/LinuxAssignment#
```

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

```
root@Himanshu: ~/#  
root@Himanshu: ~/#  
root@Himanshu: ~/# cd LinuxAssignment  
root@Himanshu: ~/LinuxAssignment# touch file1.txt  
root@Himanshu: ~/LinuxAssignment# cat file1.txt  
root@Himanshu: ~/LinuxAssignment# echo "Hello, this is my Linux Assignment file." > file1.txt  
root@Himanshu: ~/LinuxAssignment# cat file1.txt  
Hello, this is my Linux Assignment file.  
root@Himanshu: ~/LinuxAssignment# |
```

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

```
root@Himanshu: ~/# cd LinuxAssignment  
root@Himanshu: ~/LinuxAssignment# mkdir docs  
root@Himanshu: ~/LinuxAssignment# ls -l  
total 12  
drwxr-xr-x 2 root root 4096 Feb 27 12:27 docs  
-rw-r--r-- 1 root root 41 Feb 27 12:20 file1.txt  
-rw-r--r-- 1 root root 1 Feb 27 12:26 numbers  
root@Himanshu: ~/LinuxAssignment# |
```

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

```

root@Himanshu: ~/LinuxAssi  ×  +  ∨
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# mkdir docs
root@Himanshu:~/LinuxAssignment# ls -l
total 12
drwxr-xr-x 2 root root 4096 Feb 27 12:27 docs
-rw-r--r-- 1 root root  41 Feb 27 12:20 file1.txt
-rw-r--r-- 1 root root   1 Feb 27 12:26 numbers
root@Himanshu:~/LinuxAssignment# nano file1.txt
root@Himanshu:~/LinuxAssignment# ^C
root@Himanshu:~/LinuxAssignment# ^C
root@Himanshu:~/LinuxAssignment# nano file1.txt
root@Himanshu:~/LinuxAssignment# cat file1.txt
Hello, this is my Linux Assignment file.

My name is Himanshu
root@Himanshu:~/LinuxAssignment# cp file1.txt docs/file2.txt
root@Himanshu:~/LinuxAssignment# ls -l docs
total 4
-rw-r--r-- 1 root root 62 Feb 27 12:32 file2.txt
root@Himanshu:~/LinuxAssignment# cat file2.txt
cat: file2.txt: No such file or directory
root@Himanshu:~/LinuxAssignment# cd docs
root@Himanshu:~/LinuxAssignment/docs# cat file2.txt
Hello, this is my Linux Assignment file.

My name is Himanshu
root@Himanshu:~/LinuxAssignment/docs# |

```

- 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.

```

root@Himanshu: ~/LinuxAssi
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# ls
data.txt docs duplicate.txt file1.txt fruit.txt input.txt numbers numbers.txt output.txt unique.txt
root@Himanshu:~/LinuxAssignment# touch file2.txt
root@Himanshu:~/LinuxAssignment# chmod 744 file2.txt
root@Himanshu:~/LinuxAssignment# ls -l file2.txt
-rwxr--r-- 1 root root 0 Feb 27 13:30 file2.txt
root@Himanshu:~/LinuxAssignment# chown $(whoami):$(whoami) file2.txt
root@Himanshu:~/LinuxAssignment# ls -l file2.txt
-rwxr--r-- 1 root root 0 Feb 27 13:30 file2.txt
root@Himanshu:~/LinuxAssignment#

```

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

```

root@Himanshu: ~/LinuxAssi
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# cd ~/LinuxAssignment
root@Himanshu:~/LinuxAssignment# ls -l ~/LinuxAssignment
total 40
-rw-r--r-- 1 root root 94 Feb 27 12:47 data.txt
drwxr-xr-x 2 root root 4096 Feb 27 12:32 docs
-rw-r--r-- 1 root root 46 Feb 27 13:14 duplicate.txt
-rw-r--r-- 1 root root 62 Feb 27 12:31 file1.txt
-rwxr--r-- 1 root root 0 Feb 27 13:30 file2.txt
-rw-r--r-- 1 root root 65 Feb 27 13:26 fruit.txt
-rw-r--r-- 1 root root 44 Feb 27 13:10 input.txt
-rw-r--r-- 1 root root 1 Feb 27 12:26 numbers
-rw-r--r-- 1 root root 61 Feb 27 13:01 numbers.txt
-rw-r--r-- 1 root root 44 Feb 27 13:11 output.txt
-rw-r--r-- 1 root root 26 Feb 27 13:21 unique.txt
root@Himanshu:~/LinuxAssignment# ls -l /
total 2448
lrwxrwxrwx 1 root root 7 Apr 22 2024 bin -> usr/bin
drwxr-xr-x 2 root root 4096 Feb 26 2024 bin.usr-is-merged
drwxr-xr-x 2 root root 4096 Apr 22 2024 boot
drwxr-xr-x 16 root root 3580 Feb 27 09:25 dev
drwxr-xr-x 88 root root 4096 Feb 27 13:36 etc
drwxr-xr-x 3 root root 4096 Feb 24 12:31 home
-rwxrwxrwx 1 root root 2424984 Feb 12 00:59 init
lrwxrwxrwx 1 root root 7 Apr 22 2024 lib -> usr/lib
drwxr-xr-x 2 root root 4096 Apr 8 2024 lib.usr-is-merged
lrwxrwxrwx 1 root root 9 Apr 22 2024 lib64 -> usr/lib64
drwx----- 2 root root 16384 Feb 24 11:42 lost+found
drwxr-xr-x 2 root root 4096 Jan 6 20:13 media
drwxr-xr-x 6 root root 4096 Feb 24 11:43 mnt
drwxr-xr-x 2 root root 4096 Jan 6 20:13 opt
dr-xr-xr-x 241 root root 0 Feb 27 09:25 proc
drwx----- 8 root root 4096 Feb 27 12:23 root
drwxr-xr-x 19 root root 580 Feb 27 09:43 run
lrwxrwxrwx 1 root root 8 Apr 22 2024 sbin -> usr/sbin
drwxr-xr-x 2 root root 4096 Mar 31 2024 sbin.usr-is-merged
drwxr-xr-x 2 root root 4096 Feb 24 11:43 snap
drwxr-xr-x 2 root root 4096 Jan 6 20:13 srv
dr-xr-xr-x 11 root root 0 Feb 27 09:25 sys
drwxrwxrwt 12 root root 4096 Feb 27 12:27 tmp
drwxr-xr-x 12 root root 4096 Jan 6 20:13 usr
drwxr-xr-x 13 root root 4096 Feb 24 11:43 var
root@Himanshu:~/LinuxAssignment#

```

- 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).

```
root@Himanshu: ~/LinuxAssi  X + v
root@Himanshu:~/LinuxAssignment# ls
data.txt docs duplicate.txt file1.txt file2.txt fruit.txt input.txt numbers numbers.txt output.txt unique.txt
root@Himanshu:~/LinuxAssignment# find . -type f -name "*.txt"
./data.txt
./data.txt
./numbers.txt
./duplicate.txt
./input.txt
./fruit.txt
./docs/file2.txt
./file2.txt
./output.txt
./unique.txt
root@Himanshu:~/LinuxAssignment# grep apple file1.txt
apple
root@Himanshu:~/LinuxAssignment# grep apple fruit.txt
apple
apple
apple
root@Himanshu:~/LinuxAssignment# grep a fruit.txt
apple
banana
apple
orange
banana
grape
orange
apple
banana
mango
root@Himanshu:~/LinuxAssignment#
```

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

```
root@Himanshu: ~ X + v
root@Himanshu:~# date
Thu Feb 27 13:50:09 UTC 2025
root@Himanshu:~# |
```

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

```
root@Himanshu: ~  
root@Himanshu:~# hostname  
Himanshu  
root@Himanshu:~# hostname -I  
172.26.187.206  
root@Himanshu:~# ping google.com  
PING google.com (216.58.203.46) 56(84) bytes of data.  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=1 ttl=59 time=3.75 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=2 ttl=59 time=3.09 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=3 ttl=59 time=3.31 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=4 ttl=59 time=3.44 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=5 ttl=59 time=3.36 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=6 ttl=59 time=5.50 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=7 ttl=59 time=3.54 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=8 ttl=59 time=5.78 ms  
64 bytes from hkg12s10-in-f46.1e100.net (216.58.203.46): icmp_seq=9 ttl=59 time=3.37 ms  
^C  
--- google.com ping statistics ---  
9 packets transmitted, 9 received, 0% packet loss, time 8895ms  
rtt min/avg/max/mdev = 3.086/3.903/5.782/0.945 ms  
root@Himanshu:~#
```

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

```
zip error: Nothing to do! (try: zip -r docs.zip . -i docs/)  
root@Himanshu:~# mkdir docs  
root@Himanshu:~# touch docs/sample.txt  
root@Himanshu:~# zip -r docs.zip docs/  
  adding: docs/ (stored 0%)  
  adding: docs/sample.txt (stored 0%)  
root@Himanshu:~# mkdir extracted_docs  
root@Himanshu:~# unzip docs.zip -d extracted_docs/  
Archive: docs.zip  
  creating: extracted_docs/docs/  
  extracting: extracted_docs/docs/sample.txt  
root@Himanshu:~#
```

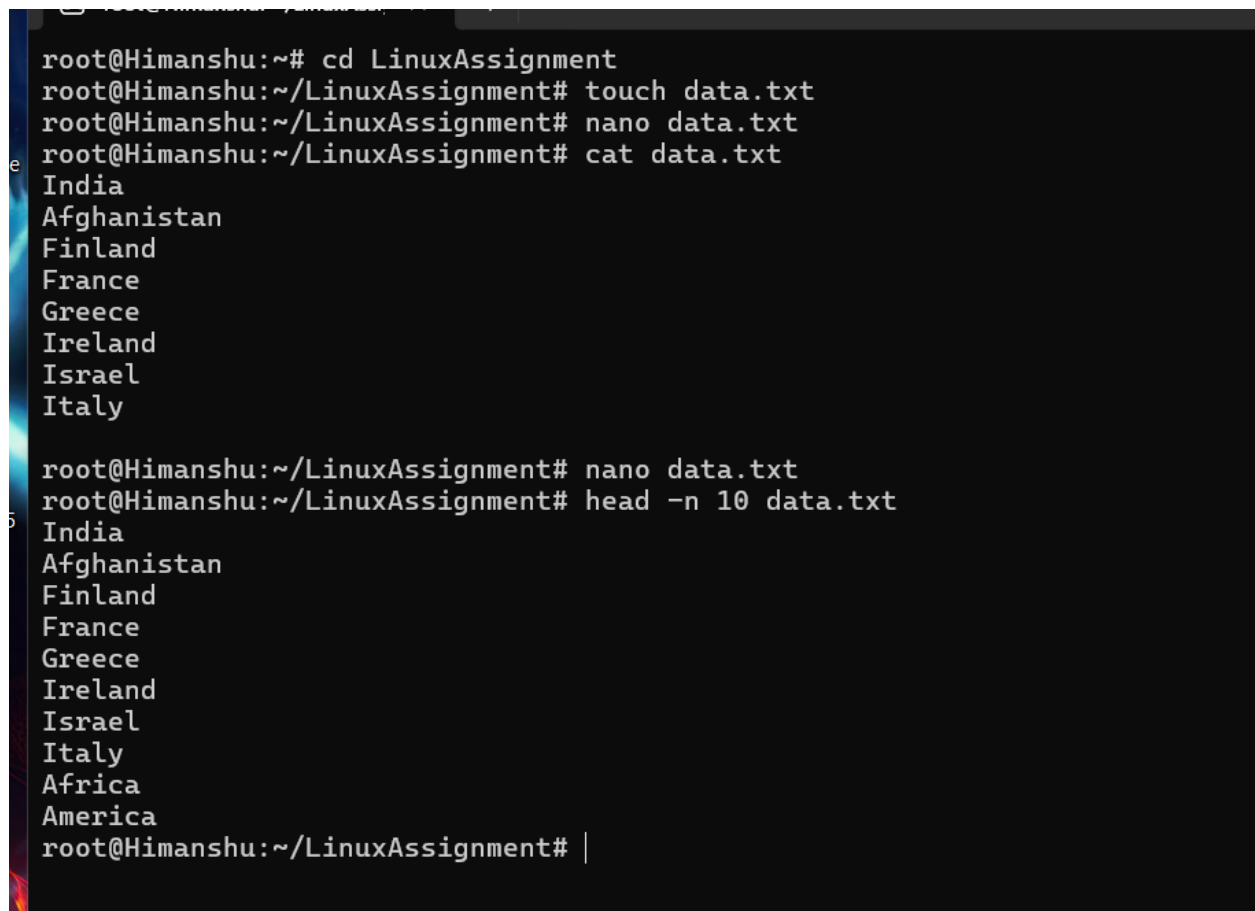
```
root@Himanshu: ~  
root@Himanshu:~# ls  
LinuxAssignment cdac docs docs.zip extracted_docs himanshu  
root@Himanshu:~#
```

- File Editing: 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).

```
root@Himanshu:~# ls
LinuxAssignment cdac docs docs.zip extracted_docs himanshu
root@Himanshu:~# touch file1
root@Himanshu:~# touch file1.txt
root@Himanshu:~# rm file1
root@Himanshu:~# ^C
root@Himanshu:~# nano file1.txt
root@Himanshu:~# sed -i 's/orange/blue/g' file1.txt
root@Himanshu:~# cat file1.txt
The sky was painted in shades of blue and pink as the sun dipped below the horizon.
A gentle breeze rustled the leaves, carrying the scent of blooming flowers
Somewhere in the distance, a faint melody played,
blending with the rhythmic sound of waves crashing against the shore.
root@Himanshu:~# sed -i 's/pink/orange/g' file1.txt
root@Himanshu:~# cat file1.txt
The sky was painted in shades of blue and orange as the sun dipped below the horizon.
A gentle breeze rustled the leaves, carrying the scent of blooming flowers
Somewhere in the distance, a faint melody played,
blending with the rhythmic sound of waves crashing against the shore.
root@Himanshu:~# |
```

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

- 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.

A terminal window with a dark background and light blue text. The prompt is 'root@Himanshu:~#'. The user enters 'cd LinuxAssignment', then 'touch data.txt', then 'nano data.txt', and finally 'cat data.txt'. The output of 'cat' shows a list of countries: India, Afghanistan, Finland, France, Greece, Ireland, Israel, and Italy. The user then enters 'nano data.txt' again, followed by 'head -n 10 data.txt'. The output of 'head' shows the same list of countries plus 'Africa' and 'America'. The prompt is now 'root@Himanshu:~/LinuxAssignment# |'.

```
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# touch data.txt
root@Himanshu:~/LinuxAssignment# nano data.txt
root@Himanshu:~/LinuxAssignment# cat data.txt
India
Afghanistan
Finland
France
Greece
Ireland
Israel
Italy

root@Himanshu:~/LinuxAssignment# nano data.txt
root@Himanshu:~/LinuxAssignment# head -n 10 data.txt
India
Afghanistan
Finland
France
Greece
Ireland
Israel
Italy
Africa
America
root@Himanshu:~/LinuxAssignment# |
```

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


```
root@Himanshu: ~/LinuxAssi
root@Himanshu:~/LinuxAssignment# nano data.txt
root@Himanshu:~/LinuxAssignment# cat data.txt
India
Afghanistan
Finland
France
Greece
Ireland
Israel
Italy

root@Himanshu:~/LinuxAssignment# nano data.txt
root@Himanshu:~/LinuxAssignment# head -n 10 data.txt
India
Afghanistan
Finland
France
Greece
Ireland
Israel
Italy
Africa
America

root@Himanshu:~/LinuxAssignment# tail -n 5 data.txt
America
Japan
Korea
Rom

root@Himanshu:~/LinuxAssignment# |
```

- 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@Himanshu: ~/LinuxAssi
root@Himanshu:~/LinuxAssignment# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# touch numbers.txt
root@Himanshu:~/LinuxAssignment# nano numbers.txt
root@Himanshu:~/LinuxAssignment# cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

root@Himanshu:~/LinuxAssignment# head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

root@Himanshu:~/LinuxAssignment# |
```

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

```
root@Himanshu: ~/LinuxAssi x + v
19
20
root@Himanshu:~/LinuxAssignment# cat numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
18
19
20
root@Himanshu:~/LinuxAssignment# tail -n 3 numbers.txt
18
19
20
root@Himanshu:~/LinuxAssignment# |
```

- 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@Himanshu: ~/LinuxAssi x + v
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# touch input.txt
root@Himanshu:~/LinuxAssignment# nano input.txt
root@Himanshu:~/LinuxAssignment# cat input.txt
hello
my name is himanshu
i am from mumbai
root@Himanshu:~/LinuxAssignment# cat input.txt | tr 'a-z' 'A-Z' > output.txt
root@Himanshu:~/LinuxAssignment# cat input.txt
hello
my name is himanshu
i am from mumbai
root@Himanshu:~/LinuxAssignment# cat output.txt
HELLO
MY NAME IS HIMANSHU
I AM FROM MUMBAI
root@Himanshu:~/LinuxAssignment# |
```

- 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@Himanshu: ~/LinuxAssi X + v
root@Himanshu:~# cd LinuxAssignment
root@Himanshu:~/LinuxAssignment# touch input.txt
root@Himanshu:~/LinuxAssignment# nano input.txt
root@Himanshu:~/LinuxAssignment# cat input.txt
hello
my name is himanshu
i am from mumbai
root@Himanshu:~/LinuxAssignment# cat input.txt | tr 'a-z' 'A-Z' > output.txt
root@Himanshu:~/LinuxAssignment# cat input.txt
hello
my name is himanshu
i am from mumbai
root@Himanshu:~/LinuxAssignment# cat output.txt
HELLO
MY NAME IS HIMANSHU
I AM FROM MUMBAI
root@Himanshu:~/LinuxAssignment# touch duplicate.txt
root@Himanshu:~/LinuxAssignment# nano duplicate.txt
root@Himanshu:~/LinuxAssignment# cat duplicate.txt
apple
banana
apple
orange
banana
grape
orange
root@Himanshu:~/LinuxAssignment# sort duplicate.txt
apple
apple
banana
banana
grape
orange
orange
root@Himanshu:~/LinuxAssignment# uniq duplicate.txt
apple
banana
apple
orange
banana
grape
orange
root@Himanshu:~/LinuxAssignment# uniq > unique.txt
^C
root@Himanshu:~/LinuxAssignment# cat unique.txt
root@Himanshu:~/LinuxAssignment# sort duplicate.txt | uniq > unique.txt
root@Himanshu:~/LinuxAssignment# cat unique.txt
apple
banana
grape
orange
root@Himanshu:~/LinuxAssignment# |
```

- 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@Himanshu: ~/LinuxAssi X + v
grape
orange
root@Himanshu:~/LinuxAssignment# uniq > unique.txt
^C
root@Himanshu:~/LinuxAssignment# cat unique.txt
root@Himanshu:~/LinuxAssignment# sort duplicate.txt | uniq > unique.txt
root@Himanshu:~/LinuxAssignment# cat unique.txt
apple
banana
grape
orange
root@Himanshu:~/LinuxAssignment# cat unique.txt
apple
banana
grape
orange
root@Himanshu:~/LinuxAssignment# touch fruit.txt
root@Himanshu:~/LinuxAssignment# nano fruit.txt
root@Himanshu:~/LinuxAssignment# cat fruit.txt
apple
banana
apple
orange
banana
grape
orange
apple
banana
mango
root@Himanshu:~/LinuxAssignment# sort fruit.txt | uniq -c
      3 apple
      3 banana
      1 grape
      1 mango
      2 orange
root@Himanshu:~/LinuxAssignment# |
```