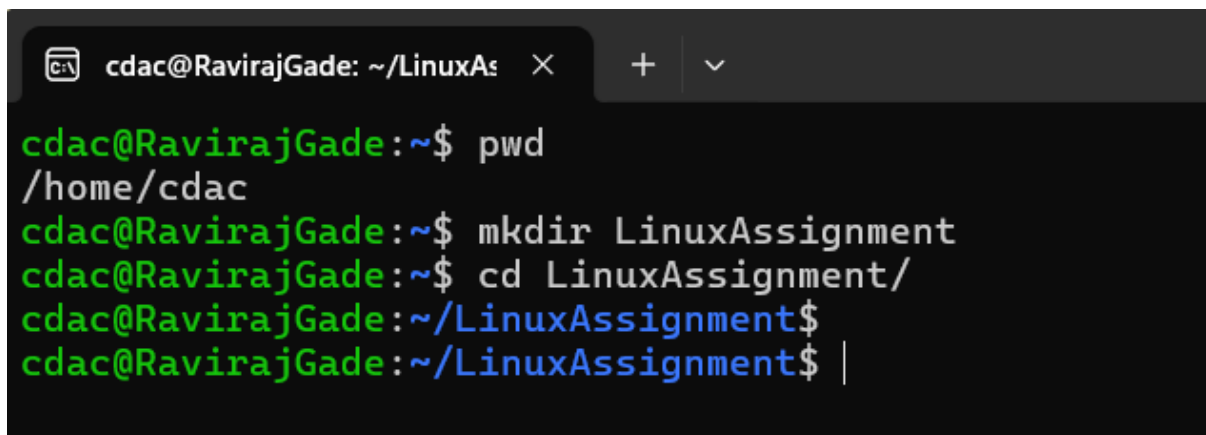


Assignment 1

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.

A terminal window with a dark background. The title bar shows 'cdac@RavirajGade: ~/LinuxAs' with a close button. The terminal content shows the following commands and output:

```
cdac@RavirajGade:~$ pwd
/home/cdac
cdac@RavirajGade:~$ mkdir LinuxAssignment
cdac@RavirajGade:~$ cd LinuxAssignment/
cdac@RavirajGade:~/LinuxAssignment$
cdac@RavirajGade:~/LinuxAssignment$ |
```

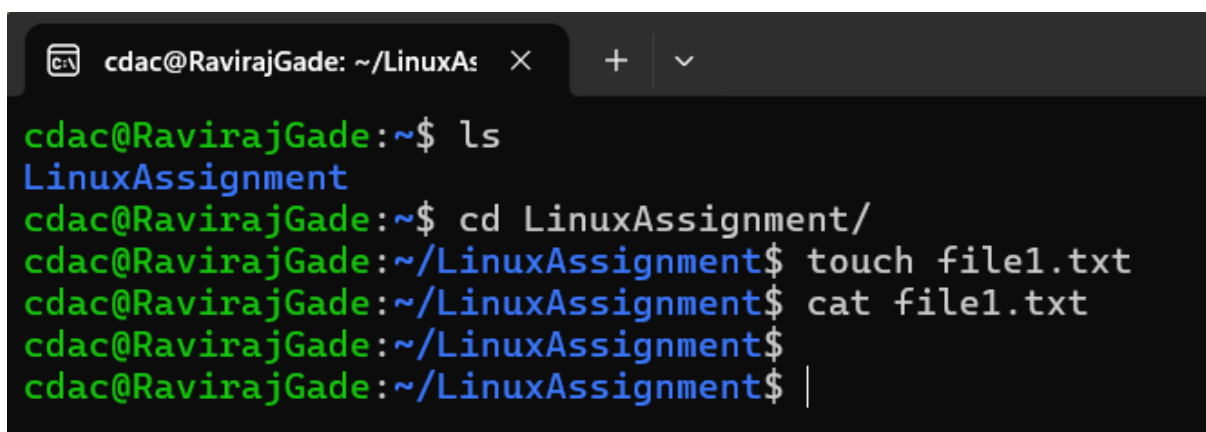
pwd Print Working directory

mkdir LinuxAssignment Create "LinuxAssignment" directory if it does not exist

cd LinuxAssignment Move into the "LinuxAssignment" directory

b) File Management:

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

A terminal window with a dark background. The title bar shows 'cdac@RavirajGade: ~/LinuxAs' with a close button. The terminal content shows the following commands and output:

```
cdac@RavirajGade:~$ ls
LinuxAssignment
cdac@RavirajGade:~$ cd LinuxAssignment/
cdac@RavirajGade:~/LinuxAssignment$ touch file1.txt
cdac@RavirajGade:~/LinuxAssignment$ cat file1.txt
cdac@RavirajGade:~/LinuxAssignment$
cdac@RavirajGade:~/LinuxAssignment$ |
```

ls Display the contents of a directory.

cd LinuxAssignment Move into the "LinuxAssignment" directory

touch file1.txt Create a new file named "file1.txt"

cat file1.txt Display its contents (empty by default)

c) Directory Management:

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

```
cdac@RavirajGade: ~/LinuxAs × + v
cdac@RavirajGade:~$ ls
LinuxAssignment
cdac@RavirajGade:~$ cd LinuxAssignment/
cdac@RavirajGade:~/LinuxAssignment$ mkdir docs
cdac@RavirajGade:~/LinuxAssignment$ ls
docs file1.txt
cdac@RavirajGade:~/LinuxAssignment$ |
```

d) Copy and Move Files:

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

```
cdac@RavirajGade: ~/LinuxAs × + v
cdac@RavirajGade:~$ ls
LinuxAssignment
cdac@RavirajGade:~$ cd LinuxAssignment/
cdac@RavirajGade:~/LinuxAssignment$ ls
docs file1.txt
cdac@RavirajGade:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@RavirajGade:~/LinuxAssignment$ ls
docs file1.txt
cdac@RavirajGade:~/LinuxAssignment$ cd docs/
cdac@RavirajGade:~/LinuxAssignment/docs$ ls
file2.txt
cdac@RavirajGade:~/LinuxAssignment/docs$ |
```

cp file1.txt docs/file2.txt Copy "file1.txt" into "docs" and rename it to "file2.txt"

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@RavirajGade: ~/LinuxAs × + v
cdac@RavirajGade:~$ ls
LinuxAssignment
cdac@RavirajGade:~$ cd LinuxAssignment/
cdac@RavirajGade:~/LinuxAssignment$ ls
docs  file1.txt
cdac@RavirajGade:~/LinuxAssignment$ cd docs/
cdac@RavirajGade:~/LinuxAssignment/docs$ ls
file2.txt
cdac@RavirajGade:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@RavirajGade:~/LinuxAssignment/docs$ chmod $(whoami) file1.txt
chmod: invalid mode: 'cdac'
Try 'chmod --help' for more information.
cdac@RavirajGade:~/LinuxAssignment/docs$ chmod $(whoami) file2.txt
chmod: invalid mode: 'cdac'
Try 'chmod --help' for more information.
cdac@RavirajGade:~/LinuxAssignment/docs$
cdac@RavirajGade:~/LinuxAssignment/docs$
cdac@RavirajGade:~/LinuxAssignment/docs$ |
```

Breakdown of 744:

The first digit 7 gives the owner read (4), write (2), and execute (1) permissions.

The second digit 4 gives the group only read (4) permissions.

The third digit 4 gives others only read (4) permissions.

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@RavirajGade: ~  
cdac@RavirajGade:~$ ls -l LinuxAssignment  
total 4  
drwxr-xr-x 2 cdac cdac 4096 Feb 27 15:44 docs  
-rw-r--r-- 1 cdac cdac 0 Feb 27 15:39 file1.txt  
cdac@RavirajGade:~$ 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 3620 Feb 27 15:30 dev  
drwxr-xr-x 87 root root 4096 Feb 27 15:30 etc  
drwxr-xr-x 3 root root 4096 Feb 24 12:27 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 12:25 lost+found  
drwxr-xr-x 2 root root 4096 Jan 6 20:13 media  
drwxr-xr-x 6 root root 4096 Feb 24 12:25 mnt  
drwxr-xr-x 2 root root 4096 Jan 6 20:13 opt  
dr-xr-xr-x 204 root root 0 Feb 27 15:31 proc  
drwx----- 4 root root 4096 Feb 24 12:26 root  
drwxr-xr-x 18 root root 540 Feb 27 15:30 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 6 root root 4096 Feb 26 10:56 snap  
drwxr-xr-x 2 root root 4096 Jan 6 20:13 srv  
dr-xr-xr-x 11 root root 0 Feb 27 15:31 sys  
drwxrwxrwt 11 root root 4096 Feb 27 15:45 tmp  
drwxr-xr-x 12 root root 4096 Jan 6 20:13 usr  
drwxr-xr-x 13 root root 4096 Feb 24 12:25 var  
cdac@RavirajGade:~$ |
```

ls -l LinuxAssignment

List contents of "LinuxAssignment"

ls -l /

List contents of the root directory

g) File Searching:

- 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).

```
cdac@RavirajGade: ~  
cdac@RavirajGade:~$ nano file1.txt  
cdac@RavirajGade:~$ find -type f -name "*.txt"  
./file1.txt  
./LinuxAssignment/file1.txt  
./LinuxAssignment/docs/file2.txt  
cdac@RavirajGade:~$ |
```

find . -type f -name "*.txt"
directory and subdirectories

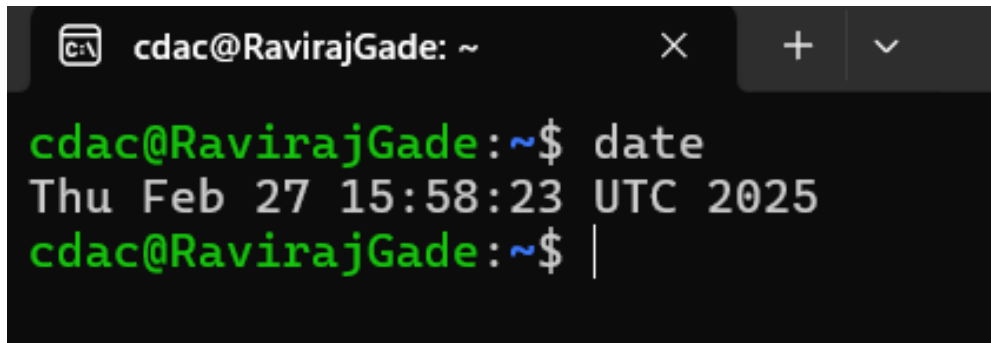
Search for all ".txt" files in the current

grep "focused" file1.txt

The word to search for in "file1.txt"

h) System Information:

a. Display the current system date and time.

A terminal window with a dark background. The title bar shows 'cdac@RavirajGade: ~' and window control buttons. The prompt is 'cdac@RavirajGade:~\$'. The command 'date' has been entered, and the output is 'Thu Feb 27 15:58:23 UTC 2025'. The prompt is now 'cdac@RavirajGade:~\$' followed by a vertical bar cursor.

```
cdac@RavirajGade:~$ date
Thu Feb 27 15:58:23 UTC 2025
cdac@RavirajGade:~$ |
```

date

Display current system date and time

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@RavirajGade: ~  
cdac@RavirajGade:~$ date  
Thu Feb 27 15:58:23 UTC 2025  
cdac@RavirajGade:~$ ip a | grep "inet"  
    inet 127.0.0.1/8 scope host lo  
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo  
    inet6 ::1/128 scope host  
    inet 172.18.229.138/20 brd 172.18.239.255 scope global eth0  
    inet6 fe80::215:5dff:fee9:68ad/64 scope link  
cdac@RavirajGade:~$ ping -c 4 yahoo.com  
PING yahoo.com (74.6.231.20) 56(84) bytes of data.  
64 bytes from media-router-fp73.prod.media.vip.ne1.yahoo.com (74.6.231.20): icmp_seq=1 ttl=41 time=473 ms  
64 bytes from media-router-fp73.prod.media.vip.ne1.yahoo.com (74.6.231.20): icmp_seq=2 ttl=41 time=408 ms  
ping: Warning: time of day goes back (-88577752us), taking countermeasures  
ping: Warning: time of day goes back (-88577422us), taking countermeasures  
64 bytes from media-router-fp73.prod.media.vip.ne1.yahoo.com (74.6.231.20): icmp_seq=3 ttl=41 time=0.000 ms  
64 bytes from media-router-fp73.prod.media.vip.ne1.yahoo.com (74.6.231.20): icmp_seq=4 ttl=41 time=448 ms  
--- yahoo.com ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3004ms  
rtt min/avg/max/mdev = 0.000/332.268/473.077/193.250 ms  
cdac@RavirajGade:~$ ping -c 4 duckduckgo.com  
PING duckduckgo.com (20.204.244.192) 56(84) bytes of data.  
64 bytes from 20.204.244.192: icmp_seq=1 ttl=111 time=71.2 ms  
64 bytes from 20.204.244.192: icmp_seq=2 ttl=111 time=181 ms  
64 bytes from 20.204.244.192: icmp_seq=3 ttl=111 time=49.5 ms  
64 bytes from 20.204.244.192: icmp_seq=4 ttl=111 time=68.0 ms  
--- duckduckgo.com ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3003ms  
rtt min/avg/max/mdev = 49.475/92.337/180.623/51.644 ms  
cdac@RavirajGade:~$
```

Command a

ip a

- ip is a Linux command used to manage networking.
- a is short for addr, meaning **show all network addresses** (IPv4 and IPv6).

grep "inet "

- grep is used to filter/search for a specific text pattern.
- "inet " matches only **IPv4 addresses** (because IPv6 addresses start with inet6).

Command b

ping Sends ICMP Echo Request packets to test network reachability.

-c 4 Limits the ping to 4 packets (otherwise, ping runs indefinitely).

yahoo.com This is the **remote server** we are testing connectivity to.

duckduckgo.com This is the **Search Engine** we are testing connectivity to.

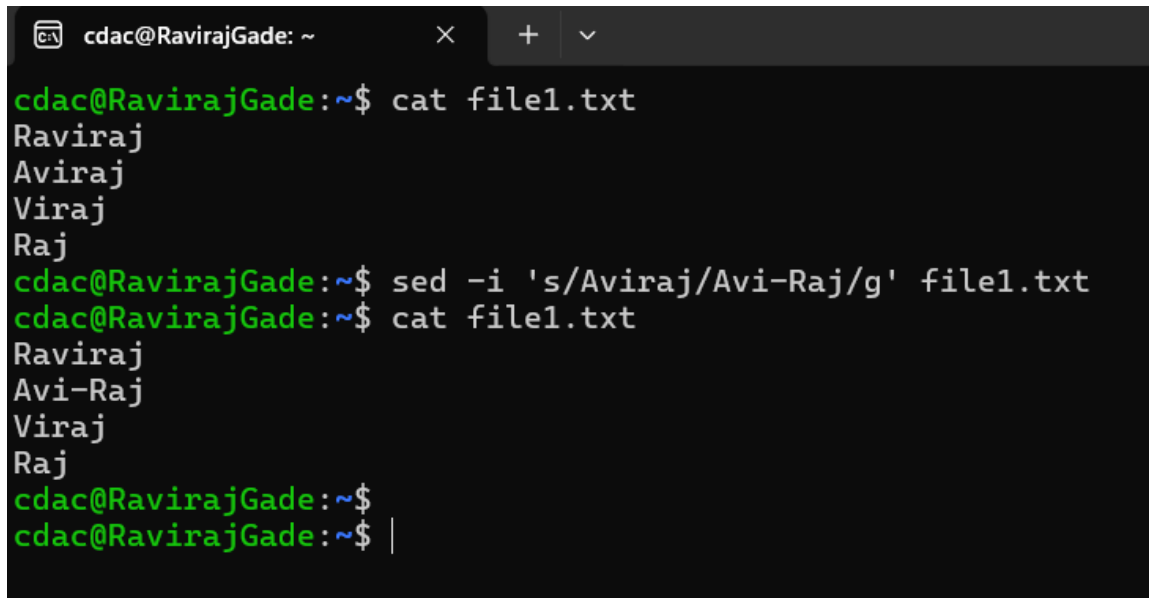
j) File Compression:

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

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

k) File Editing:

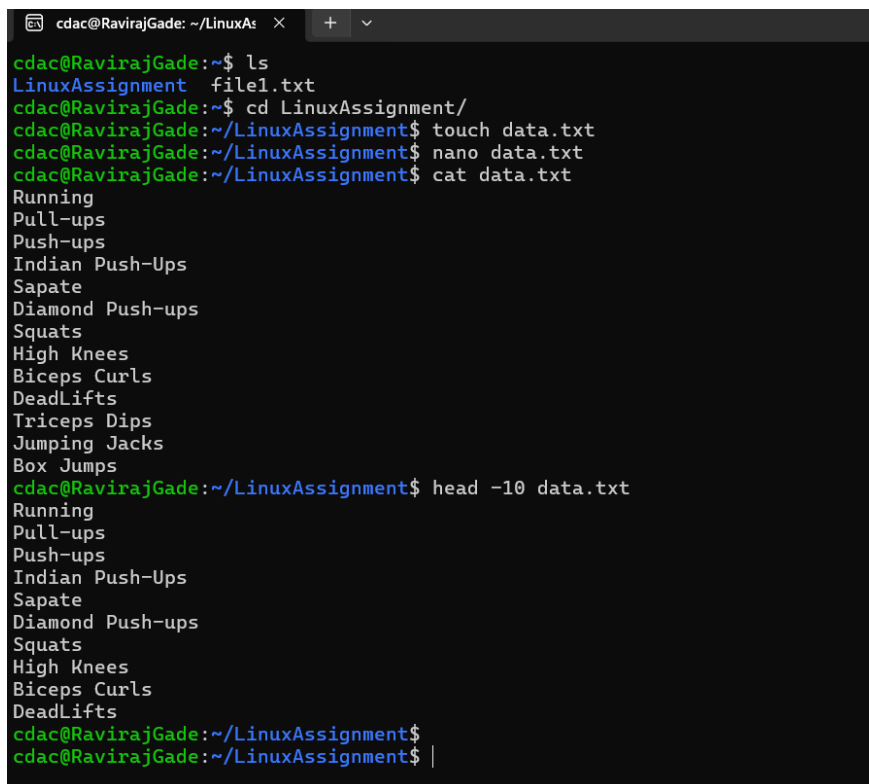
- Open the "file1.txt" file in a text editor and add some text to it.
- Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).



```
cdac@RavirajGade: ~  
cdac@RavirajGade:~$ cat file1.txt  
Raviraj  
Aviraj  
Viraj  
Raj  
cdac@RavirajGade:~$ sed -i 's/Aviraj/Avi-Raj/g' file1.txt  
cdac@RavirajGade:~$ cat file1.txt  
Raviraj  
Avi-Raj  
Viraj  
Raj  
cdac@RavirajGade:~$  
cdac@RavirajGade:~$ |
```

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.

A terminal window titled 'cdac@RavirajGade: ~/LinuxAs' with a dark background and light green text. The user performs several commands: 'ls' showing 'file1.txt', 'cd LinuxAssignment/', 'touch data.txt', 'nano data.txt', and 'cat data.txt'. The output of 'cat data.txt' lists 15 exercises: Running, Pull-ups, Push-ups, Indian Push-Ups, Sapate, Diamond Push-ups, Squats, High Knees, Biceps Curls, DeadLifts, Triceps Dips, Jumping Jacks, Box Jumps, and then repeats the first 10 exercises. Finally, the user runs 'head -10 data.txt' which displays the first 10 exercises.

```
cdac@RavirajGade:~$ ls
LinuxAssignment  file1.txt
cdac@RavirajGade:~$ cd LinuxAssignment/
cdac@RavirajGade:~/LinuxAssignment$ touch data.txt
cdac@RavirajGade:~/LinuxAssignment$ nano data.txt
cdac@RavirajGade:~/LinuxAssignment$ cat data.txt
Running
Pull-ups
Push-ups
Indian Push-Ups
Sapate
Diamond Push-ups
Squats
High Knees
Biceps Curls
DeadLifts
Triceps Dips
Jumping Jacks
Box Jumps
cdac@RavirajGade:~/LinuxAssignment$ head -10 data.txt
Running
Pull-ups
Push-ups
Indian Push-Ups
Sapate
Diamond Push-ups
Squats
High Knees
Biceps Curls
DeadLifts
cdac@RavirajGade:~/LinuxAssignment$
cdac@RavirajGade:~/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@RavirajGade: ~/LinuxAs x + v
cdac@RavirajGade:~/LinuxAssignment$ cat data.txt
Running
Pull-ups
Push-ups
Indian Push-Ups
Sapate
Diamond Push-ups
Squats
High Knees
Biceps Curls
DeadLifts
Triceps Dips
Jumping Jacks
Box Jumps
cdac@RavirajGade:~/LinuxAssignment$ tail -5 data.txt
Biceps Curls
DeadLifts
Triceps Dips
Jumping Jacks
Box Jumps
cdac@RavirajGade:~/LinuxAssignment$
cdac@RavirajGade:~/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.

```
cdac@RavirajGade: ~/LinuxAs x + v
cdac@RavirajGade:~/LinuxAssignment$ ls
data.txt docs file1.txt numbers.txt
cdac@RavirajGade:~/LinuxAssignment$ nano numbers.txt
cdac@RavirajGade:~/LinuxAssignment$ ls
data.txt docs file1.txt numbers.txt
cdac@RavirajGade:~/LinuxAssignment$ head -15 numbers.txt
007
008
087
414
101
542
5420
41
78
54
55
45
87
96
96
cdac@RavirajGade:~/LinuxAssignment$
cdac@RavirajGade:~/LinuxAssignment$ |
```

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

```
cdac@RavirajGade: ~/LinuxAss × + v
cdac@RavirajGade:~/LinuxAssignment$ ls
data.txt docs file1.txt numbers.txt
cdac@RavirajGade:~/LinuxAssignment$ tail -3 numbers.txt
54
844

cdac@RavirajGade:~/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@RavirajGade: ~/LinuxAss × + v
cdac@RavirajGade:~/LinuxAssignment$ nano input.txt
cdac@RavirajGade:~/LinuxAssignment$ tr 'a-z' 'A-Z' <input.txt> output.txt
cdac@RavirajGade:~/LinuxAssignment$ ls
data.txt docs file1.txt input.txt numbers.txt output.txt
cdac@RavirajGade:~/LinuxAssignment$ cat input.txt
The sun dipped below the horizon, casting a warm golden glow across the sky.
The air was cool, and the soft rustling of leaves in the breeze added to the
tranquility of the moment.As the evening settled in, the world seemed to slow
down, inviting a sense of peace that was hard to find during the bustle of the
day. It was a brief, beautiful pause in time.
cdac@RavirajGade:~/LinuxAssignment$ cat output.txt
THE SUN DIPPED BELOW THE HORIZON, CASTING A WARM GOLDEN GLOW ACROSS THE SKY.
THE AIR WAS COOL, AND THE SOFT RUSTLING OF LEAVES IN THE BREEZE ADDED TO THE
TRANQUILITY OF THE MOMENT.AS THE EVENING SETTLED IN, THE WORLD SEEMED TO SLOW
DOWN, INVITING A SENSE OF PEACE THAT WAS HARD TO FIND DURING THE BUSTLE OF THE
DAY. IT WAS A BRIEF, BEAUTIFUL PAUSE IN TIME.
cdac@RavirajGade:~/LinuxAssignment$
cdac@RavirajGade:~/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@RavirajGade: ~/LinuxAs × + v
cdac@RavirajGade:~/LinuxAssignment$ cat duplicate.txt
India
Brazil
Canada
Germany
Japan
Kenya
Qatar
Russia
Spain
Thailand
India
Russia
America
Jermani

cdac@RavirajGade:~/LinuxAssignment$ cat duplicate.txt | sort | uniq

America
Brazil
Canada
Germany
India
Japan
Jermani
Kenya
Qatar
Russia
Spain
Thailand
cdac@RavirajGade:~/LinuxAssignment$ |
```

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@RavirajGade: ~/LinuxAs × + ∨  
cdac@RavirajGade:~/LinuxAssignment$ nano fruit.txt  
cdac@RavirajGade:~/LinuxAssignment$ cat fruit.txt  
Apple  
Banana  
Orange  
Mango  
Stawberry  
Blueberry  
Pineapple  
Watermelon  
Grape  
Pear  
Kiwi  
Peach  
Plum  
Papaya  
Lemon  
Apple  
Papaya  
Grape  
Mango  
  
cdac@RavirajGade:~/LinuxAssignment$ cat fruit.txt | sort | uniq  
Apple  
Banana  
Blueberry  
Grape  
Kiwi  
Lemon  
Mango  
Mango  
Orange  
Papaya  
Peach  
Pear  
Pineapple  
Plum  
Stawberry  
Watermelon  
cdac@RavirajGade:~/LinuxAssignment$ |
```