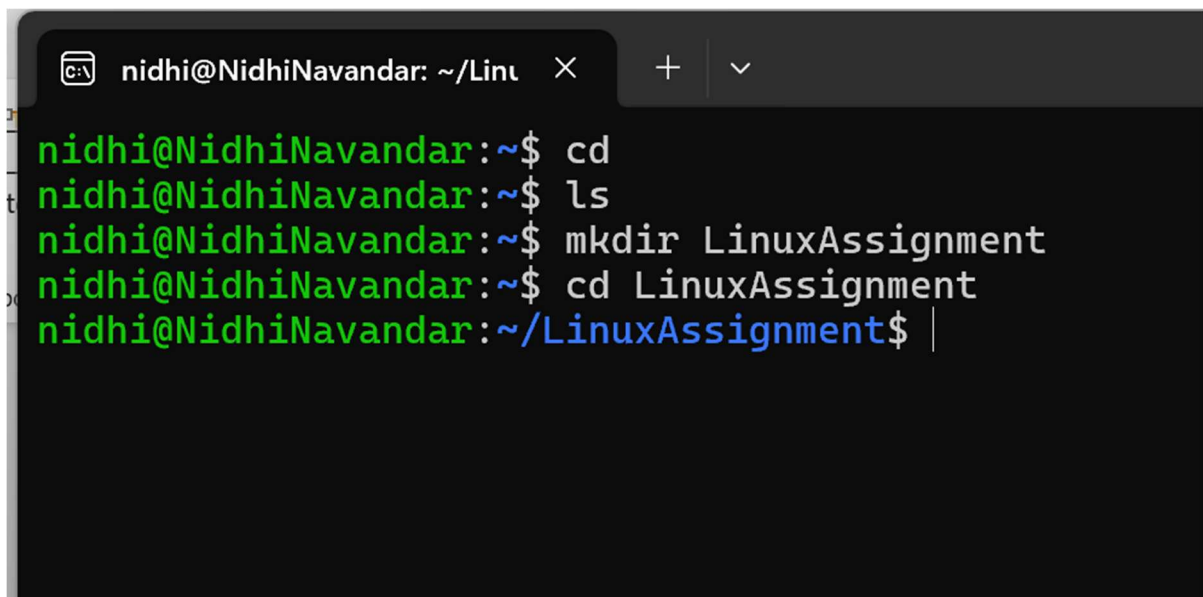


# Assignment 1

**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 and light green text. The window title is 'nidhi@NidhiNavandar: ~/Lin'. The terminal shows a sequence of commands: 'cd', 'ls', 'mkdir LinuxAssignment', 'cd LinuxAssignment', and the prompt changes to '~/.LinuxAssignment\$'.

```
nidhi@NidhiNavandar:~$ cd
nidhi@NidhiNavandar:~$ ls
nidhi@NidhiNavandar:~$ mkdir LinuxAssignment
nidhi@NidhiNavandar:~$ cd LinuxAssignment
nidhi@NidhiNavandar:~/.LinuxAssignment$ |
```

**cd**            Navigate to the home directory

**ls**            List contents of the home 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.

```
nidhi@NidhiNavandar: ~/Linu X + v
nidhi@NidhiNavandar:~$ cd
nidhi@NidhiNavandar:~$ ls
nidhi@NidhiNavandar:~$ mkdir LinuxAssignment
nidhi@NidhiNavandar:~$ cd LinuxAssignment
nidhi@NidhiNavandar:~/LinuxAssignment$ touch file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cat file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ |
```

**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.

```
nidhi@NidhiNavandar: ~/Linu X + v
nidhi@NidhiNavandar:~$ cd
nidhi@NidhiNavandar:~$ ls
nidhi@NidhiNavandar:~$ mkdir LinuxAssignment
nidhi@NidhiNavandar:~$ cd LinuxAssignment
nidhi@NidhiNavandar:~/LinuxAssignment$ touch file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cat file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ mkdir docs
nidhi@NidhiNavandar:~/LinuxAssignment$ ls
docs file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ |
```

### d) Copy and Move Files:

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

```
nidhi@NidhiNavandar: ~/Linu × + v
nidhi@NidhiNavandar:~$ cd
nidhi@NidhiNavandar:~$ ls
nidhi@NidhiNavandar:~$ mkdir LinuxAssignment
nidhi@NidhiNavandar:~$ cd LinuxAssignment
nidhi@NidhiNavandar:~/LinuxAssignment$ touch file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cat file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ mkdir docs
nidhi@NidhiNavandar:~/LinuxAssignment$ ls
docs  file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cp file1.txt docs/file2.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ ls
docs  file1.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cd docs
nidhi@NidhiNavandar:~/LinuxAssignment/docs$ ls
file2.txt
nidhi@NidhiNavandar:~/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.

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

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.

```
nidhi@NidhiNavandar: ~  
nidhi@NidhiNavandar:~$ ls -l LinuxAssignment  
total 4  
drwxr-xr-x 2 nidhi nidhi 4096 Feb 26 16:50 docs  
-rw-r--r-- 1 nidhi nidhi 0 Feb 26 16:46 file1.txt  
nidhi@NidhiNavandar:~$ 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 26 16:37 dev  
drwxr-xr-x 88 root root 4096 Feb 26 16:55 etc  
drwxr-xr-x 3 root root 4096 Feb 25 12:36 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 25 12:32 lost+found  
drwxr-xr-x 2 root root 4096 Feb 15 08:09 media  
drwxr-xr-x 6 root root 4096 Feb 25 12:35 mnt  
drwxr-xr-x 2 root root 4096 Feb 15 08:09 opt  
dr-xr-xr-x 229 root root 0 Feb 26 16:37 proc  
drwx----- 3 root root 4096 Feb 15 08:11 root  
drwxr-xr-x 18 root root 580 Feb 26 16:45 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 25 12:35 snap  
drwxr-xr-x 2 root root 4096 Feb 15 08:09 srv  
dr-xr-xr-x 11 root root 0 Feb 26 16:37 sys  
drwxrwxrwt 12 root root 4096 Feb 26 16:56 tmp  
drwxr-xr-x 12 root root 4096 Feb 15 08:09 usr  
drwxr-xr-x 13 root root 4096 Feb 25 12:35 var  
nidhi@NidhiNavandar:~$ |
```

**ls -l LinuxAssignment**

List contents of "LinuxAssignment"

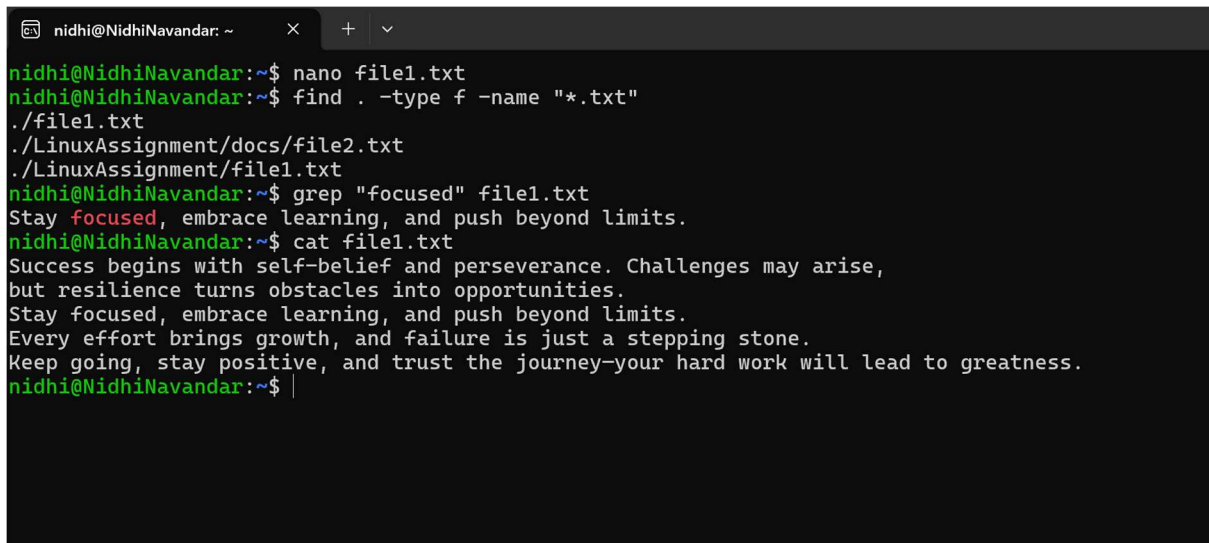
**ls -l /**

List contents of the root directory

#### 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).

A terminal window with a dark background and green text. The prompt is 'nidhi@NidhiNavandar: ~'. The user enters 'nano file1.txt', then 'find . -type f -name "\*.txt"', which lists './file1.txt', './LinuxAssignment/docs/file2.txt', and './LinuxAssignment/file1.txt'. Then they enter 'grep "focused" file1.txt', which shows three lines of text containing the word 'focused'. Finally, they enter 'cat file1.txt', which displays the full content of the file.

```
nidhi@NidhiNavandar:~$ nano file1.txt
nidhi@NidhiNavandar:~$ find . -type f -name "*.txt"
./file1.txt
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
nidhi@NidhiNavandar:~$ grep "focused" file1.txt
Stay focused, embrace learning, and push beyond limits.
nidhi@NidhiNavandar:~$ cat file1.txt
Success begins with self-belief and perseverance. Challenges may arise,
but resilience turns obstacles into opportunities.
Stay focused, embrace learning, and push beyond limits.
Every effort brings growth, and failure is just a stepping stone.
Keep going, stay positive, and trust the journey-your hard work will lead to greatness.
nidhi@NidhiNavandar:~$ |
```

**find . -type f -name "\*.txt"**  
subdirectories

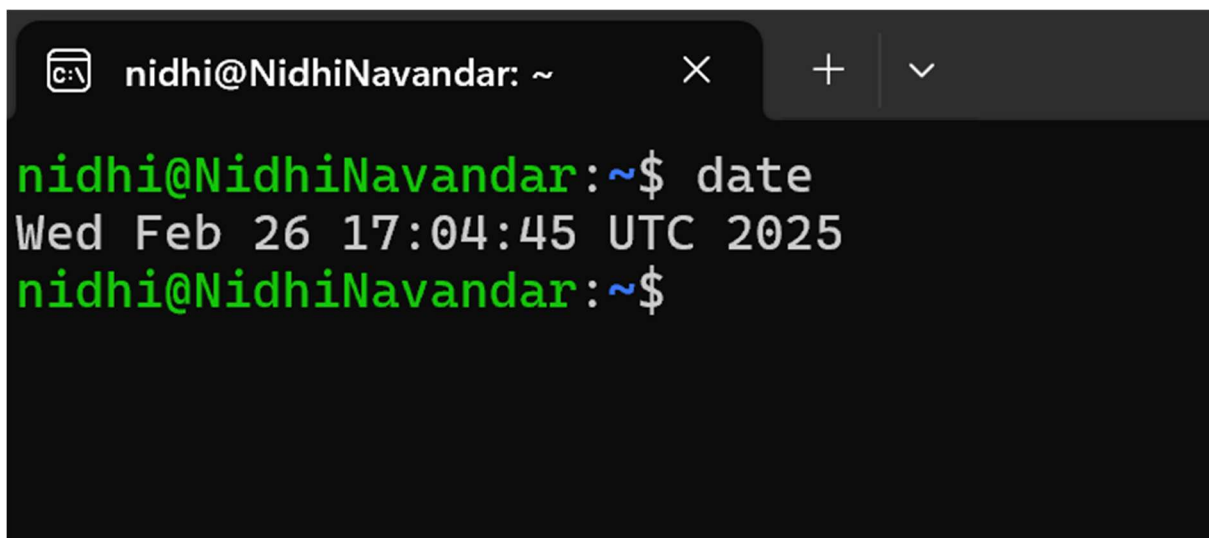
Search for all ".txt" files in the current directory and

**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 and green text. The prompt is 'nidhi@NidhiNavandar: ~'. The user enters 'date', and the terminal displays 'Wed Feb 26 17:04:45 UTC 2025'.

```
nidhi@NidhiNavandar:~$ date
Wed Feb 26 17:04:45 UTC 2025
nidhi@NidhiNavandar:~$
```

**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).

```
nidhi@NidhiNavandar: ~  
nidhi@NidhiNavandar:~$ date  
Wed Feb 26 17:04:45 UTC 2025  
nidhi@NidhiNavandar:~$ 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  
    inet 172.29.51.91/20 brd 172.29.63.255 scope global eth0  
nidhi@NidhiNavandar:~$ ping -c 4 google.com  
PING google.com (142.251.42.14) 56(84) bytes of data.  
64 bytes from bom12s19-in-f14.1e100.net (142.251.42.14): icmp_seq=1 ttl=115 time=14.8 ms  
64 bytes from bom12s19-in-f14.1e100.net (142.251.42.14): icmp_seq=2 ttl=115 time=15.6 ms  
64 bytes from bom12s19-in-f14.1e100.net (142.251.42.14): icmp_seq=3 ttl=115 time=14.4 ms  
64 bytes from bom12s19-in-f14.1e100.net (142.251.42.14): icmp_seq=4 ttl=115 time=12.1 ms  
  
--- google.com ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3271ms  
rtt min/avg/max/mdev = 12.088/14.225/15.556/1.299 ms  
nidhi@NidhiNavandar:~$
```

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).

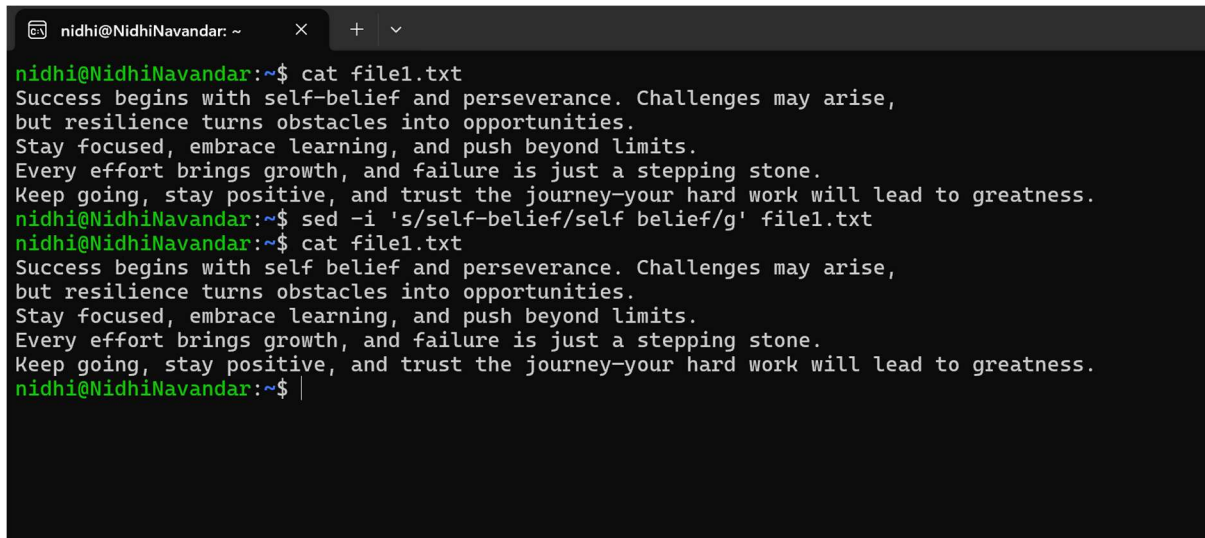
**google.com** This is the **remote server** we are testing connectivity to.

#### **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:**

- 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 with a dark background and light green text. The window title is 'nidhi@NidhiNavandar: ~'. The user has executed several commands: 'cat file1.txt' to view the original text, 'sed -i 's/self-belief/self belief/g' file1.txt' to replace 'self-belief' with 'self belief', and 'cat file1.txt' again to verify the change. The text in the file is an inspirational paragraph about success, resilience, and perseverance.

```
nidhi@NidhiNavandar: ~$ cat file1.txt
Success begins with self-belief and perseverance. Challenges may arise,
but resilience turns obstacles into opportunities.
Stay focused, embrace learning, and push beyond limits.
Every effort brings growth, and failure is just a stepping stone.
Keep going, stay positive, and trust the journey-your hard work will lead to greatness.
nidhi@NidhiNavandar:~$ sed -i 's/self-belief/self belief/g' file1.txt
nidhi@NidhiNavandar:~$ cat file1.txt
Success begins with self belief and perseverance. Challenges may arise,
but resilience turns obstacles into opportunities.
Stay focused, embrace learning, and push beyond limits.
Every effort brings growth, and failure is just a stepping stone.
Keep going, stay positive, and trust the journey-your hard work will lead to greatness.
nidhi@NidhiNavandar:~$ |
```

**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.

```
nidhi@NidhiNavandar: ~/Linux × + v
Children laugh, building castles with tiny hands and more.
A fisherman sails, hoping for a bountiful catch today.
The sky turns orange as the evening draws in slow.
Families gather, sharing stories of love and days ago.
Streetlights flicker, guiding wanderers through the silent night.
The moon glows softly, casting shadows upon the quiet town.
Dogs bark distantly, their voices blending into the midnight air.
A cool breeze carries whispers of dreams yet untold.
Stars twinkle brightly, painting pictures across the vast sky.
Night embraces the world in a soothing, gentle lullaby.
People sleep, dreaming of hopes and new beginnings ahead.
The clock ticks, marking time's silent and steady march.
Morning arrives, bringing light and life to all again.
The birds awaken, singing melodies of hope and cheer.
Another day starts, filled with endless possibilities to explore.
Smiles spread, as kindness touches hearts far and near.
Life continues, a beautiful journey of moments big and small.

nidhi@NidhiNavandar:~/LinuxAssignment$ head -10 data.txt
The sun shines brightly over the calm and peaceful sea.
Birds fly high, singing songs of joy and endless glee.
Waves crash gently against the golden, sunlit sandy shore.
Children laugh, building castles with tiny hands and more.
A fisherman sails, hoping for a bountiful catch today.
The sky turns orange as the evening draws in slow.
Families gather, sharing stories of love and days ago.
Streetlights flicker, guiding wanderers through the silent night.
The moon glows softly, casting shadows upon the quiet town.
Dogs bark distantly, their voices blending into the midnight air.
nidhi@NidhiNavandar:~/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.**

```
nidhi@NidhiNavandar: ~/Linux × + v
nidhi@NidhiNavandar:~/LinuxAssignment$ tail -5 data.txt
The birds awaken, singing melodies of hope and cheer.
Another day starts, filled with endless possibilities to explore.
Smiles spread, as kindness touches hearts far and near.
Life continues, a beautiful journey of moments big and small.

nidhi@NidhiNavandar:~/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.

```
nidhi@NidhiNavandar: ~/LinuxAssignment$ nano numbers.txt
nidhi@NidhiNavandar: ~/LinuxAssignment$ ls
data.txt  docs  file1.txt  numbers.txt
nidhi@NidhiNavandar: ~/LinuxAssignment$ head -15 numbers.txt
1
13
7
20
00
714
711
713
23
21
6
68
72
95
97
nidhi@NidhiNavandar: ~/LinuxAssignment$ |
```

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

```
nidhi@NidhiNavandar: ~/LinuxAssignment$ tail -3 numbers.txt
87
78

nidhi@NidhiNavandar: ~/LinuxAssignment$ nano numbers.txt
nidhi@NidhiNavandar: ~/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."

```
nidhi@NidhiNavandar: ~/LinuxAssignment$ nano input.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ ls
data.txt docs file1.txt input.txt numbers.txt output.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cat input.txt
the sun rises over the calm ocean.
birds sing softly in the morning breeze.
waves crash gently onto the sandy shore.
children play happily under the warm sun.
another day begins with joy and hope.
nidhi@NidhiNavandar:~/LinuxAssignment$ cat output.txt
THE SUN RISES OVER THE CALM OCEAN.
BIRDS SING SOFTLY IN THE MORNING BREEZE.
WAVES CRASH GENTLY ONTO THE SANDY SHORE.
CHILDREN PLAY HAPPILY UNDER THE WARM SUN.
ANOTHER DAY BEGINS WITH JOY AND HOPE.
nidhi@NidhiNavandar:~/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."

```
nidhi@NidhiNavandar: ~/LinuxAssignment$ nano duplicate.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cat duplicate.txt | sort | uniq
tree, river, mountain, ocean, forest, tree, river, mountain, ocean, forest, sun, rain, wind, flower, cloud
nidhi@NidhiNavandar:~/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."

```
nidhi@NidhiNavandar:~/LinuxAssignment$ nano fruits.txt
nidhi@NidhiNavandar:~/LinuxAssignment$ cat fruits.txt
apple, banana, mango, orange, grapes, pineapple, papaya, kiwi, watermelon, cherry, strawberry, apple, blueberry
pomegranate, guava, pear, peach, fig, apple, jackfruit, apple, mango, lychee, dragonfruit
nidhi@NidhiNavandar:~/LinuxAssignment$ cat fruits.txt | sort | uniq
apple, banana, mango, orange, grapes, pineapple, papaya, kiwi, watermelon, cherry, strawberry, apple, blueberry
pomegranate, guava, pear, peach, fig, apple, jackfruit, apple, mango, lychee, dragonfruit
nidhi@NidhiNavandar:~/LinuxAssignment$
```