

# Assignment 1

## Concepts of Operating System

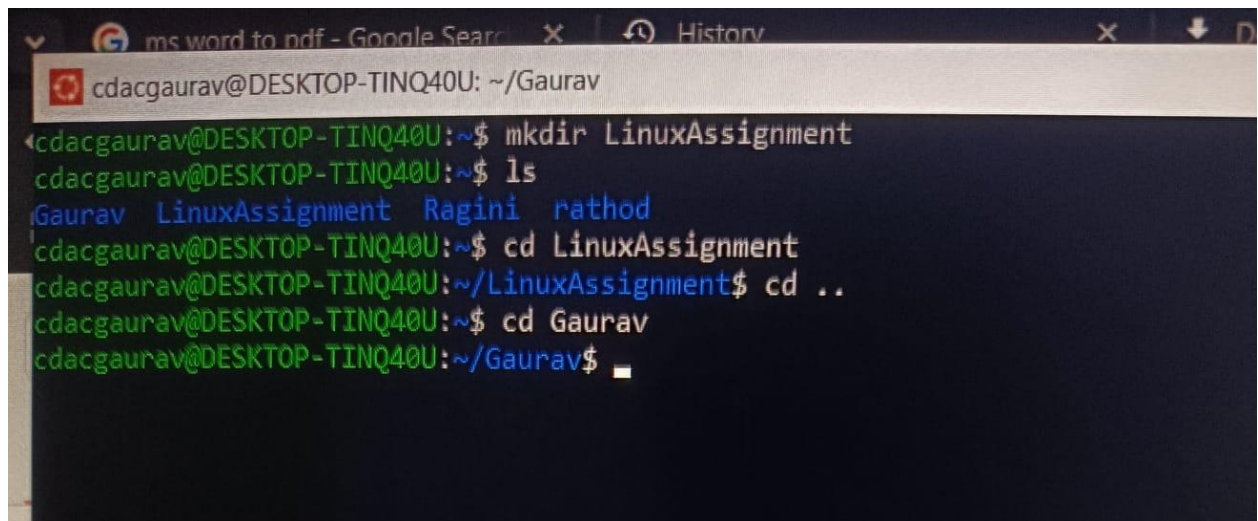
**SUBMIT BY : GAURAV RATHOD**

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.

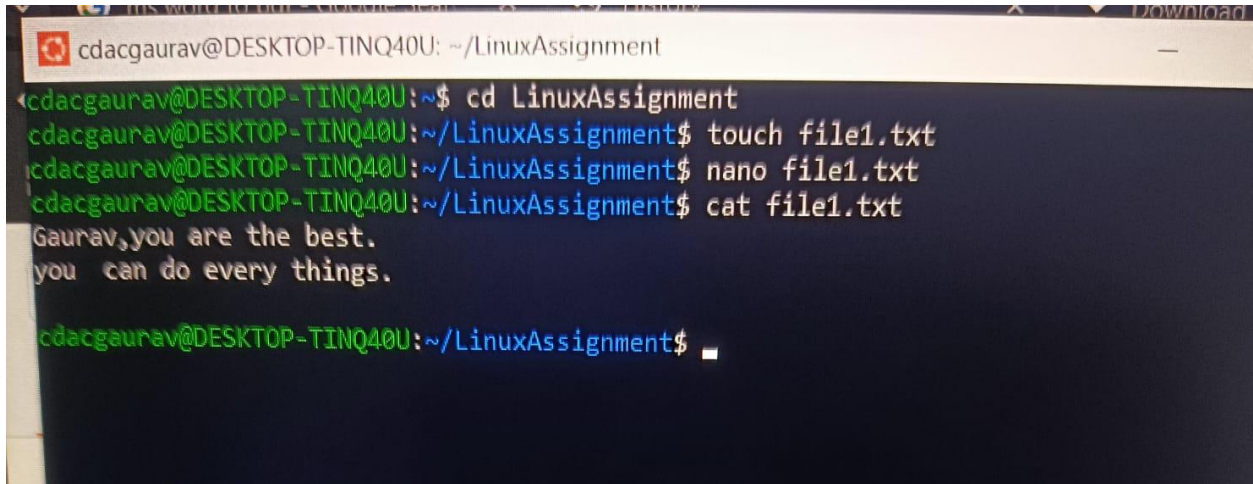
Ans.

A screenshot of a terminal window with a dark background. The window title bar shows "ms word to pdf - Google Search" and "History". The terminal prompt is "cdacgaurav@DESKTOP-TINQ40U: ~/Gaurav". The user enters "mkdir LinuxAssignment", then "ls", which shows "Gaurav LinuxAssignment Ragini rathod". Then the user enters "cd LinuxAssignment", then "cd ..", then "cd Gaurav", and finally "cd Gaurav" again, returning to the home directory.

```
cdacgaurav@DESKTOP-TINQ40U: ~/Gaurav
cdacgaurav@DESKTOP-TINQ40U:~$ mkdir LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~$ ls
Gaurav LinuxAssignment Ragini rathod
cdacgaurav@DESKTOP-TINQ40U:~$ cd LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cd ..
cdacgaurav@DESKTOP-TINQ40U:~$ cd Gaurav
cdacgaurav@DESKTOP-TINQ40U:~/Gaurav$
```

## b) File Management:

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

A terminal window titled 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment' shows the following commands and output:

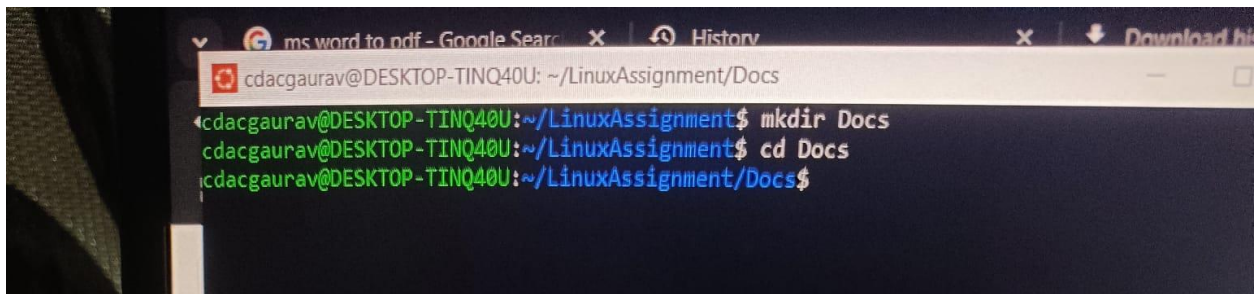
```
cdacgaurav@DESKTOP-TINQ40U:~$ cd LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ touch file1.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ nano file1.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat file1.txt
Gaurav,you are the best.
you can do every things.

cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

## c) Directory Management:

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

Ans.

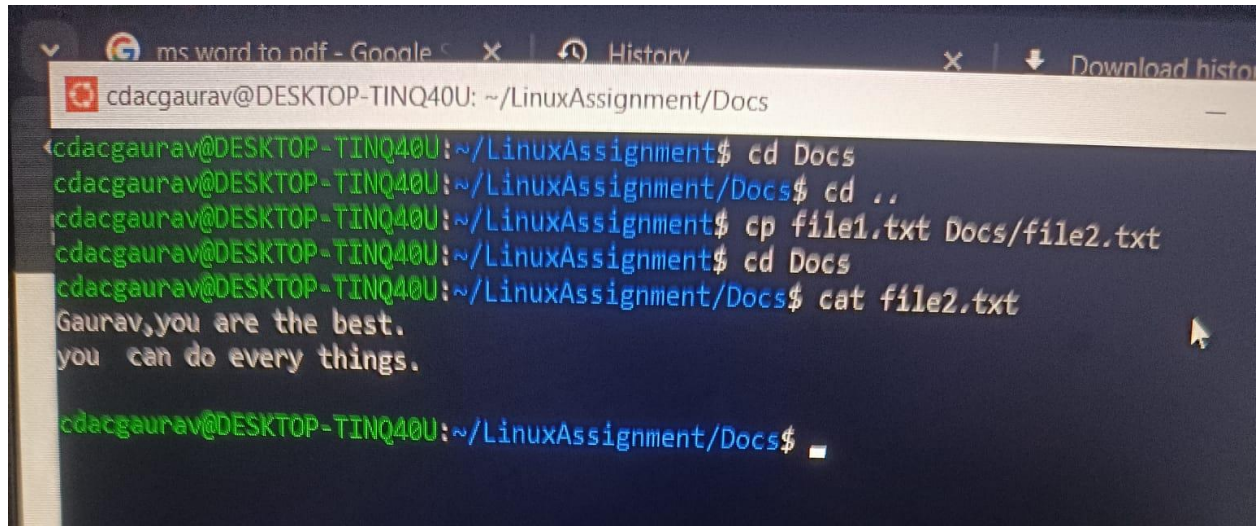
A terminal window titled 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs' shows the following commands and output:

```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ mkdir Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cd Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$
```

#### d) Copy and Move Files:

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

Ans.

A terminal window with a dark background and light green text. The window title bar shows a browser tab for 'ms word to pdf - Google' and a 'History' button. The terminal prompt is 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs'. The user enters 'cd Docs', then 'cd ..', then 'cp file1.txt Docs/file2.txt', then 'cd Docs', and finally 'cat file2.txt'. The output of the cat command is 'Gaurav, you are the best.' and 'you can do every things.' on two separate lines. The prompt is now 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs\$' with a cursor.

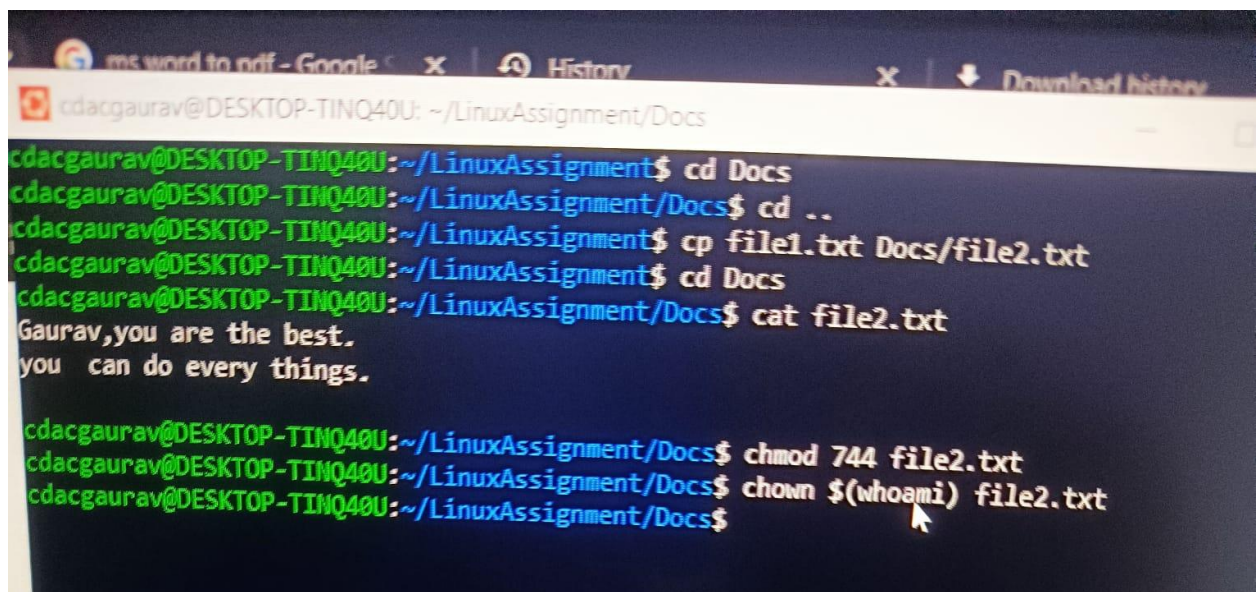
```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cd Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ cd ..
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cp file1.txt Docs/file2.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cd Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ cat file2.txt
Gaurav, you are the best.
you can do every things.

cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$
```

#### 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.

Ans.

A terminal window with a dark background and light green text. The window title bar shows a browser tab for 'ms word to pdf - Google' and a 'History' button. The terminal prompt is 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs'. The user enters 'cd Docs', then 'cd ..', then 'cp file1.txt Docs/file2.txt', then 'cd Docs', and finally 'cat file2.txt'. The output of the cat command is 'Gaurav, you are the best.' and 'you can do every things.' on two separate lines. The prompt is now 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs\$'. The user then enters 'chmod 744 file2.txt', then 'chown \$(whoami) file2.txt', and the prompt is now 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment/Docs\$' with a cursor.

```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ cd Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ cd ..
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cp file1.txt Docs/file2.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cd Docs
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ cat file2.txt
Gaurav, you are the best.
you can do every things.

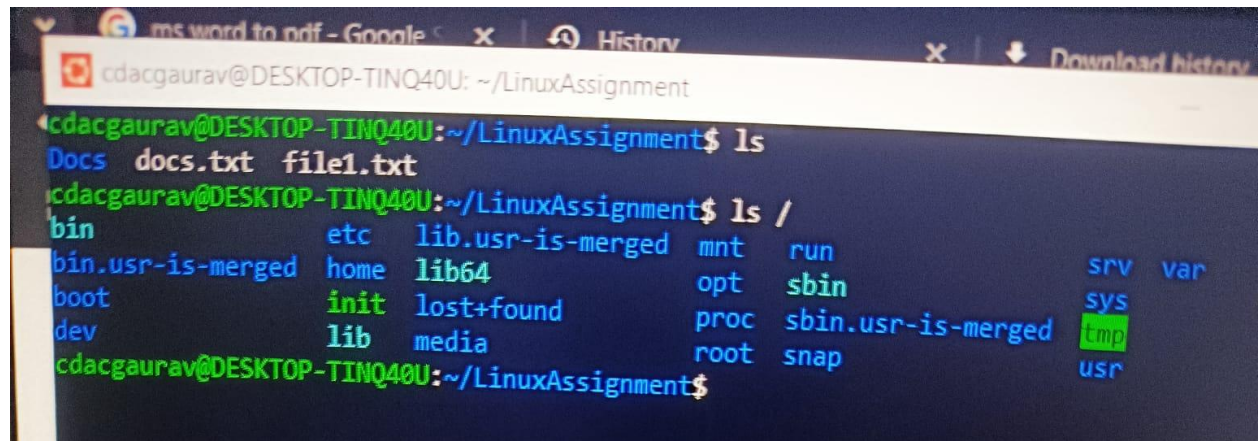
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ chmod 744 file2.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$ chown $(whoami) file2.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment/Docs$
```



### f) Final Checklist:

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

Ans.

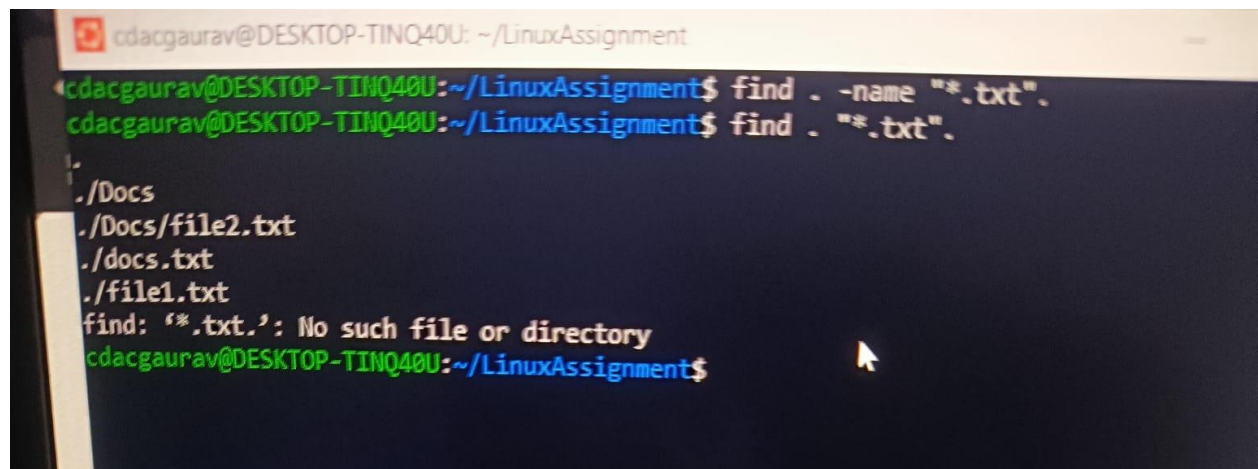


```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ ls
Docs  docs.txt  file1.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ ls /
bin          etc          lib.usr-is-merged  mnt  run          srv  var
bin.usr-is-merged  home        lib64              opt  sbin         sys
boot         init        lost+found         proc sbin.usr-is-merged  tmp
dev          lib         media              root snap        usr
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

### g) File Searching:

- a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

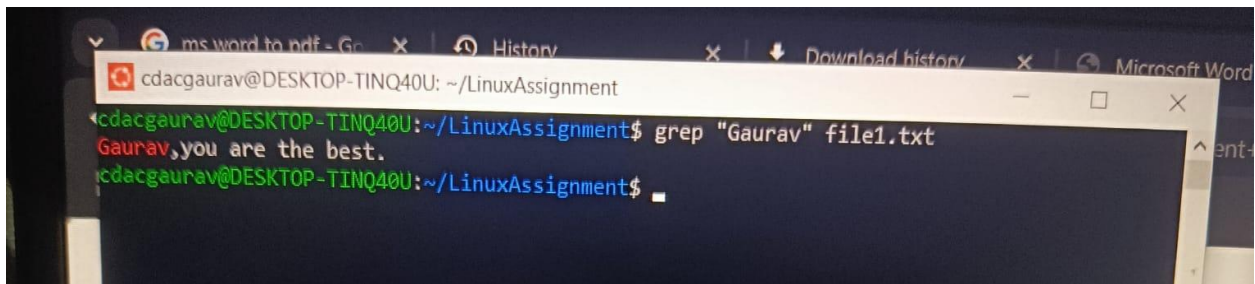
Ans.



```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ find . -name "*.txt".
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ find . "*.txt".
./Docs
./Docs/file2.txt
./docs.txt
./file1.txt
find: '*.txt.': No such file or directory
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

- b. Display lines containing a specific word in a file (provide a file name and the specific word to search).

Ans.

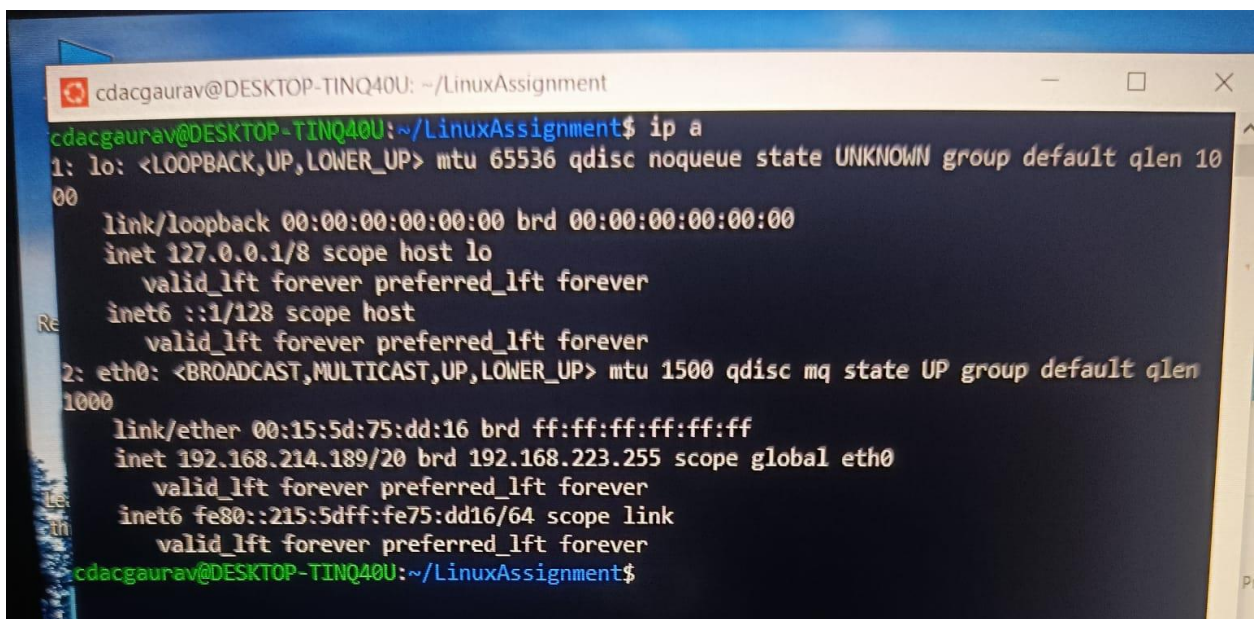


```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ grep "Gaurav" file1.txt
Gaurav,you are the best.
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

## h) System Information:

- a. Display the current system date and time.
- i) Networking: a. Display the IP address of the system.

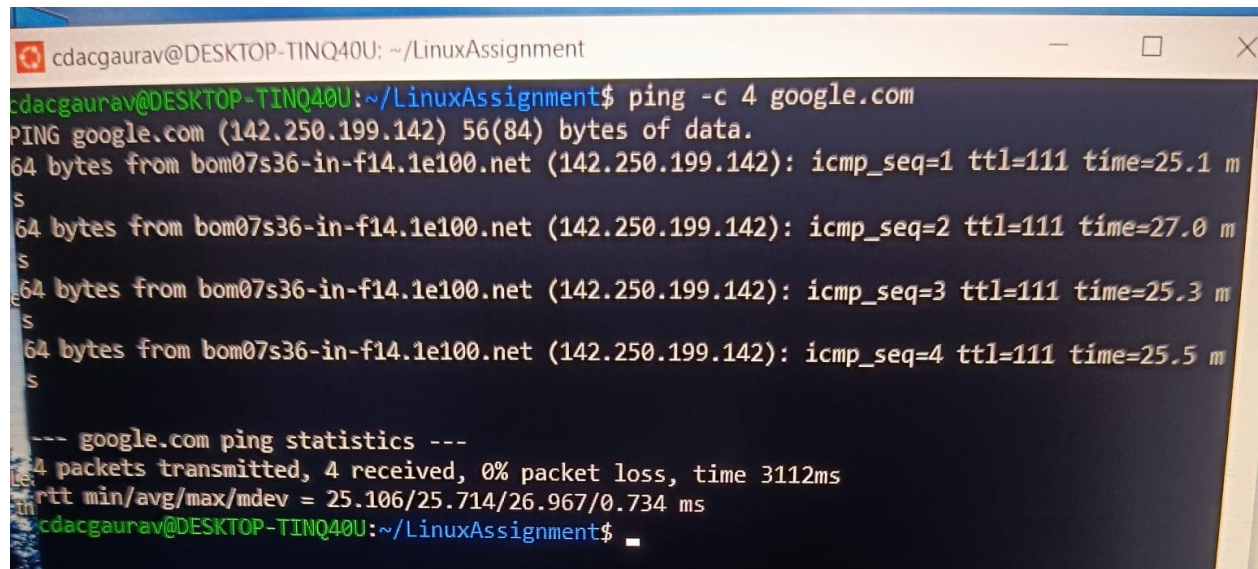
Ans.



```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:75:dd:16 brd ff:ff:ff:ff:ff:ff
    inet 192.168.214.189/20 brd 192.168.223.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe75:dd16/64 scope link
        valid_lft forever preferred_lft forever
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

- b. Ping a remote server to check connectivity (provide a remote server address to ping).

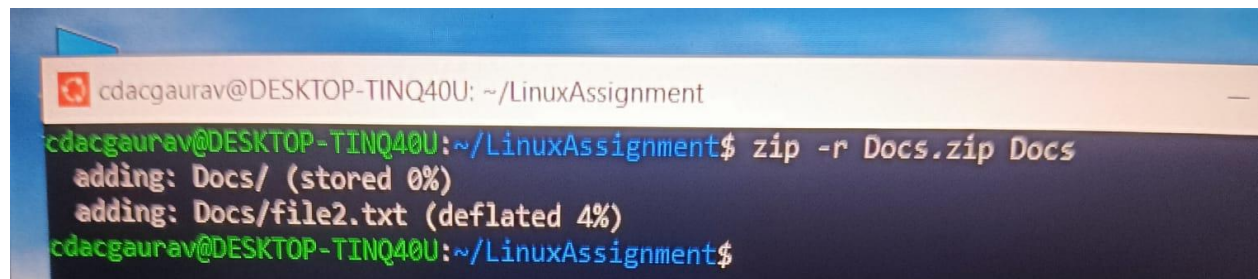
Ans

A terminal window titled 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment' showing the execution of a ping command. The command is 'ping -c 4 google.com'. The output shows four successful ping requests to google.com (142.250.199.142) with 56(84) bytes of data. Each request shows '64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp\_seq=1 ttl=111 time=25.1 m s', 'icmp\_seq=2 ttl=111 time=27.0 m s', 'icmp\_seq=3 ttl=111 time=25.3 m s', and 'icmp\_seq=4 ttl=111 time=25.5 m s'. Below the ping results, it shows '--- google.com ping statistics ---', '4 packets transmitted, 4 received, 0% packet loss, time 3112ms', and 'rtt min/avg/max/mdev = 25.106/25.714/26.967/0.734 ms'. The prompt returns to 'cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment\$'.

### j) File Compression:

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

Ans.

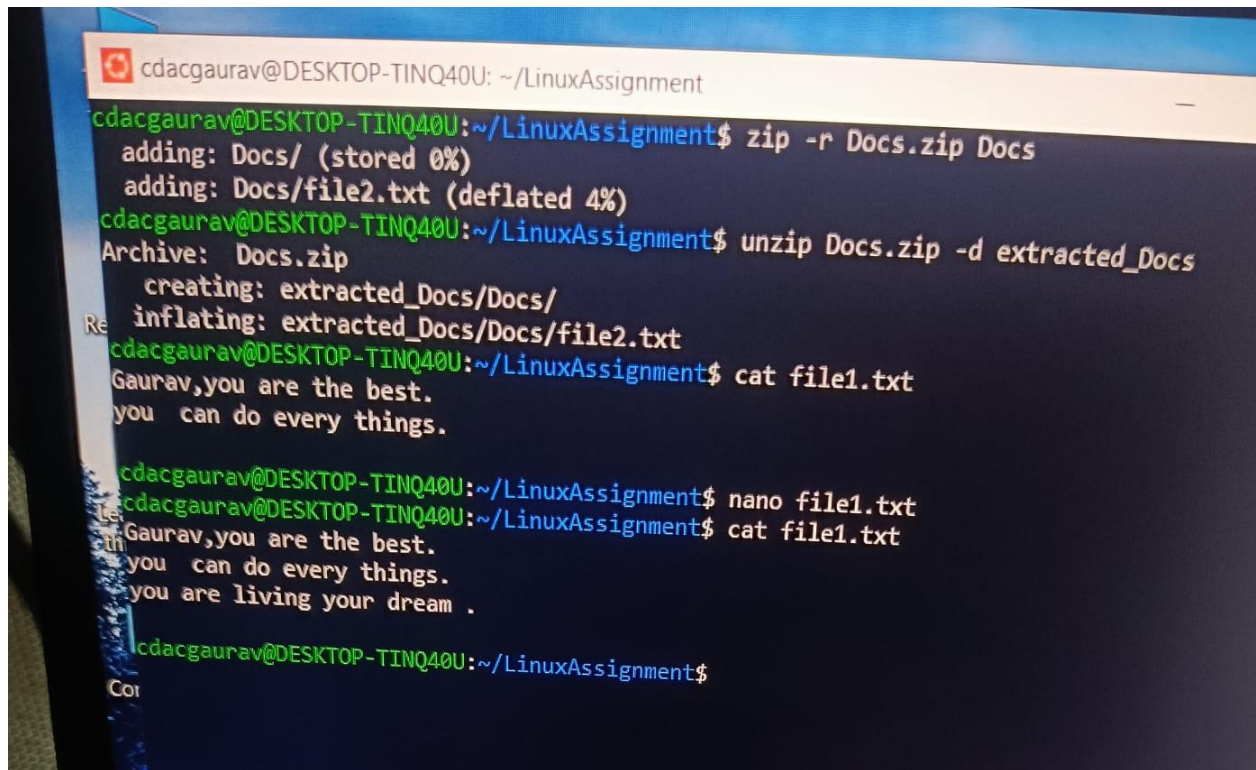
A terminal window titled 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment' showing the execution of a zip command. The command is 'zip -r Docs.zip Docs'. The output shows 'adding: Docs/ (stored 0%)' and 'adding: Docs/file2.txt (deflated 4%)'. The prompt returns to 'cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment\$'.

### 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).



Ans.

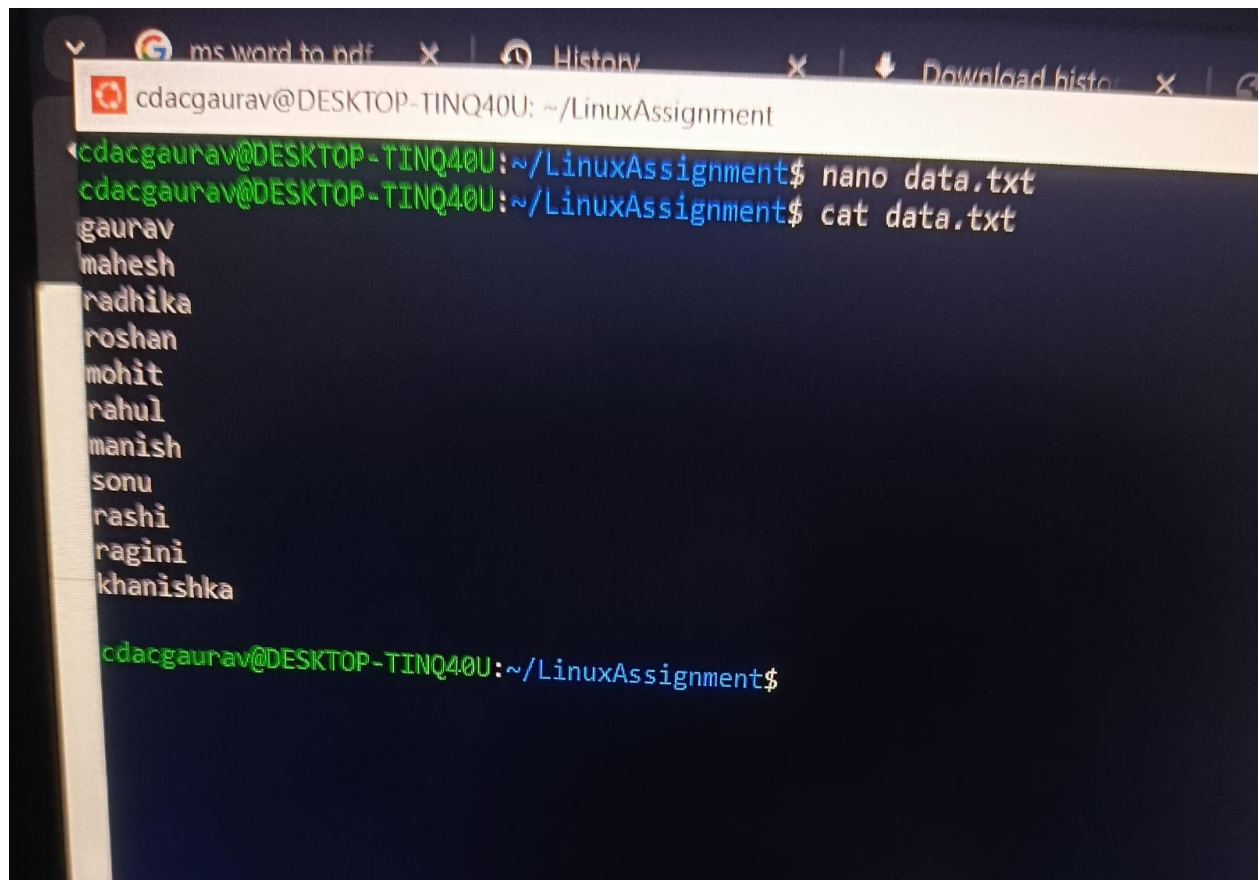
A screenshot of a Linux terminal window. The title bar shows the user 'cdacgaaurav' and the machine 'DESKTOP-TINQ40U' with the current directory '~/LinuxAssignment'. The terminal shows the following commands and output: 1. 'zip -r Docs.zip Docs' is executed, showing 'adding: Docs/ (stored 0%)' and 'adding: Docs/file2.txt (deflated 4%)'. 2. 'unzip Docs.zip -d extracted\_Docs' is executed, showing 'Archive: Docs.zip', 'creating: extracted\_Docs/Docs/', and 'inflating: extracted\_Docs/Docs/file2.txt'. 3. 'cat file1.txt' is executed, displaying the text 'Gaurav, you are the best.' and 'you can do every things.' on two lines. 4. 'nano file1.txt' is executed. 5. 'cat file1.txt' is executed again, displaying the text 'Gaurav, you are the best.', 'you can do every things.', and 'you are living your dream .' on three lines. The prompt 'cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment\$' is visible at the end of the last command.

```
cdacgaaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ zip -r Docs.zip Docs
  adding: Docs/ (stored 0%)
  adding: Docs/file2.txt (deflated 4%)
cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ unzip Docs.zip -d extracted_Docs
Archive: Docs.zip
  creating: extracted_Docs/Docs/
  inflating: extracted_Docs/Docs/file2.txt
cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat file1.txt
Gaurav, you are the best.
you can do every things.
cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ nano file1.txt
cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat file1.txt
Gaurav, you are the best.
you can do every things.
you are living your dream .
cdacgaaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

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.

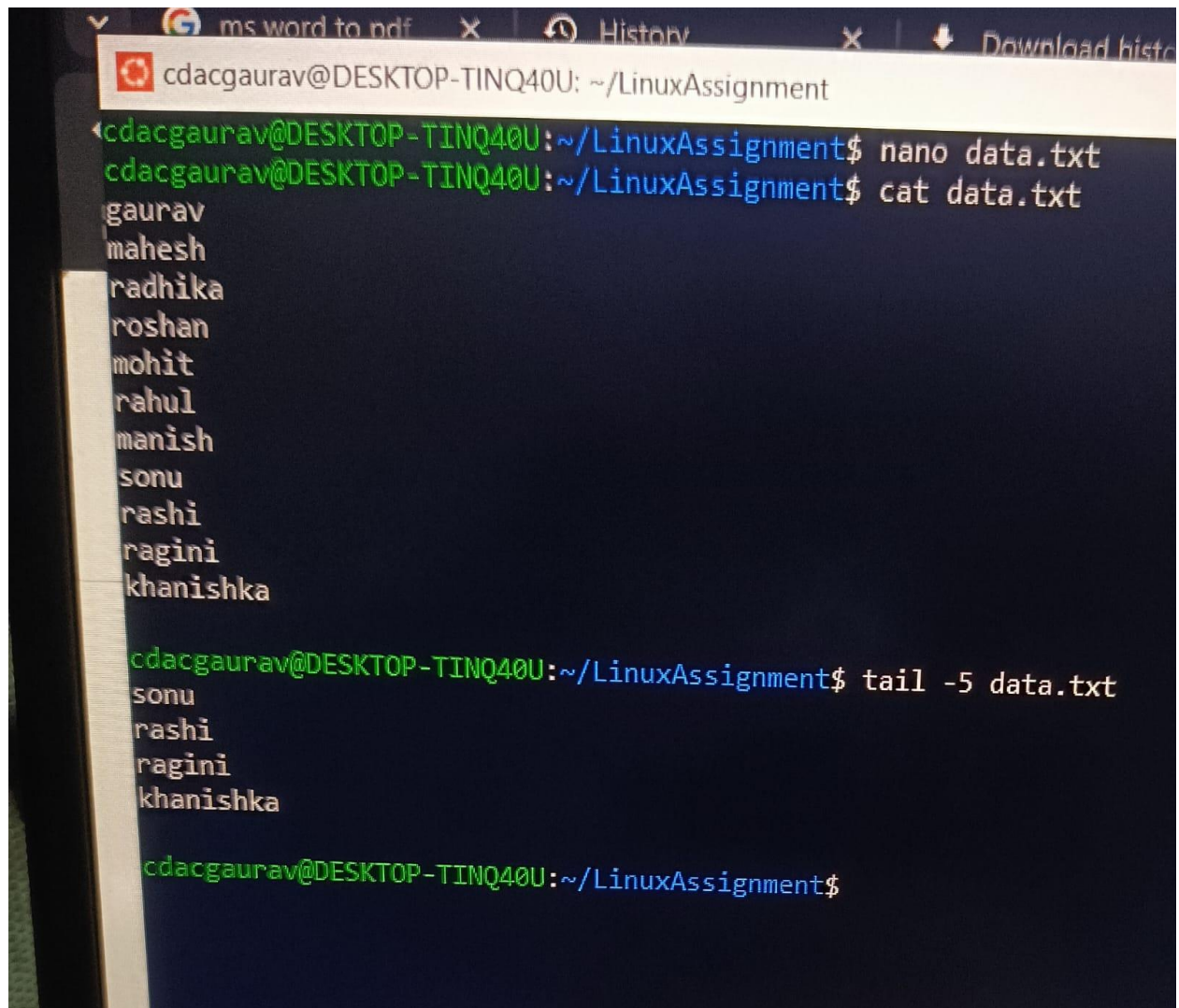
A photograph of a computer screen showing a terminal window. The terminal has a dark blue background with green and white text. At the top, a browser-like address bar shows the user 'cdacgaurav@DESKTOP-TINQ40U' and the directory '~/LinuxAssignment'. The terminal shows two commands being executed: 'nano data.txt' and 'cat data.txt'. The output of the 'cat' command is a list of names: gaurav, mahesh, radhika, roshan, mohit, rahul, manish, sonu, rashmi, ragini, and khanishka. The prompt returns to the shell after the list is displayed.

```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ nano data.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat data.txt
gaurav
mahesh
radhika
roshan
mohit
rahul
manish
sonu
rashmi
ragini
khanishka
cdacgaurav@DESKTOP-TINQ40U:~/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.

Ans.

A terminal window screenshot showing a series of commands and their outputs. The window title is 'cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment'. The user runs 'nano data.txt', then 'cat data.txt', which displays a list of names: gaurav, mahesh, radhika, roshan, mohit, rahul, manish, sonu, rashi, ragini, and khanishka. Then, the user runs 'tail -5 data.txt', which displays the last five names: sonu, rashi, ragini, and khanishka. The terminal ends with the prompt 'cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment\$'.

```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ nano data.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat data.txt
gaurav
mahesh
radhika
roshan
mohit
rahul
manish
sonu
rashi
ragini
khanishka

cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ tail -5 data.txt
sonu
rashi
ragini
khanishka

cdacgaurav@DESKTOP-TINQ40U:~/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.

```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ tail -5 data.txt
sonu
rashi
ragini
khanishka

cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ head -10 data.txt
gaurav
mahesh
radhika
roshan
mohit
rahul
manish
sonu
rashi
ragini
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

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



cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment

Download history

```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ touch numbers.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ nano numbers.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat numbers.txt
```

```
1
2
3
4
5
6
7
8
9
10
```

```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ tail -n 3 numbers.txt
```

```
9
10
```

```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ tail -4 number.txt
```

```
tail: cannot open 'number.txt' for reading: No such file or directory
```

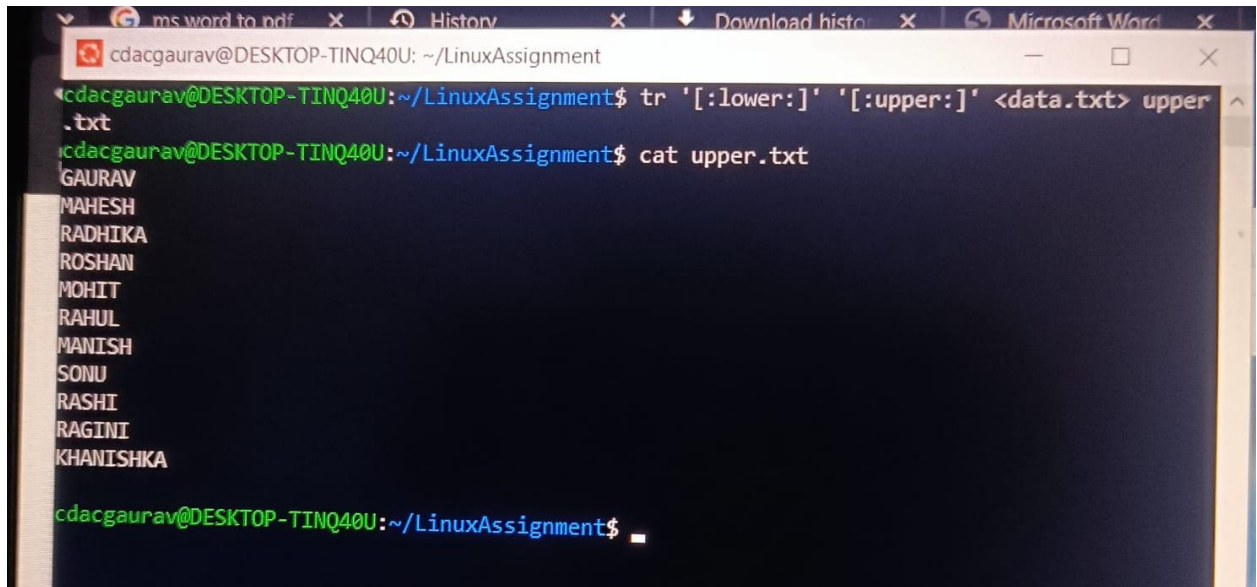
```
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ tail -4 numbers.txt
```

```
8
9
10
```

```
cdacgaurav@DESKTOP-TINQ40U:~/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.



```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' <data.txt> upper
.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat upper.txt
GAURAV
MAHESH
RADHIKA
ROSHAN
MOHIT
RAHUL
MANISH
SONU
RASHI
RAGINI
KHANISHKA
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```

The image shows a terminal window with a dark background. The user is in the directory ~/LinuxAssignment. They run the command `tr '[:lower:]' '[:upper:]' <data.txt> upper.txt` to convert the contents of data.txt to uppercase and save it to upper.txt. Then, they run `cat upper.txt` to display the contents of the new file, which lists names in all caps: GAURAV, MAHESH, RADHIKA, ROSHAN, MOHIT, RAHUL, MANISH, SONU, RASHI, RAGINI, and KHANISHKA.

- 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.



```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat data.txt
gaurav
mahesh
radhika
roshan
mohit
gaurav
radhika
roshan
mohit
mahesh
rahul
manish
sonu
rashi
ragini
khanishka

cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ sort data.txt | uniq
gaurav
khanishka
mahesh
manish
mohit
radhika
radhika
ragini
rahul
rashi
roshan
sonu
cdacgaurav@DESKTOP-TINQ40U:~/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."

Ans

```
cdacgaurav@DESKTOP-TINQ40U: ~/LinuxAssignment
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ nano fruit.txt
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ cat fruit.txt
banana
apple
graps
banana
graps
banana

cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$ sort fruit.txt | uniq -c
1
1 apple
3 banana
2 graps
cdacgaurav@DESKTOP-TINQ40U:~/LinuxAssignment$
```