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.

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

c) **Directory Management:**
   a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

d) **Copy and Move Files:**
   a. Copy the "file1.txt" file into the "docs" directory 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.

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

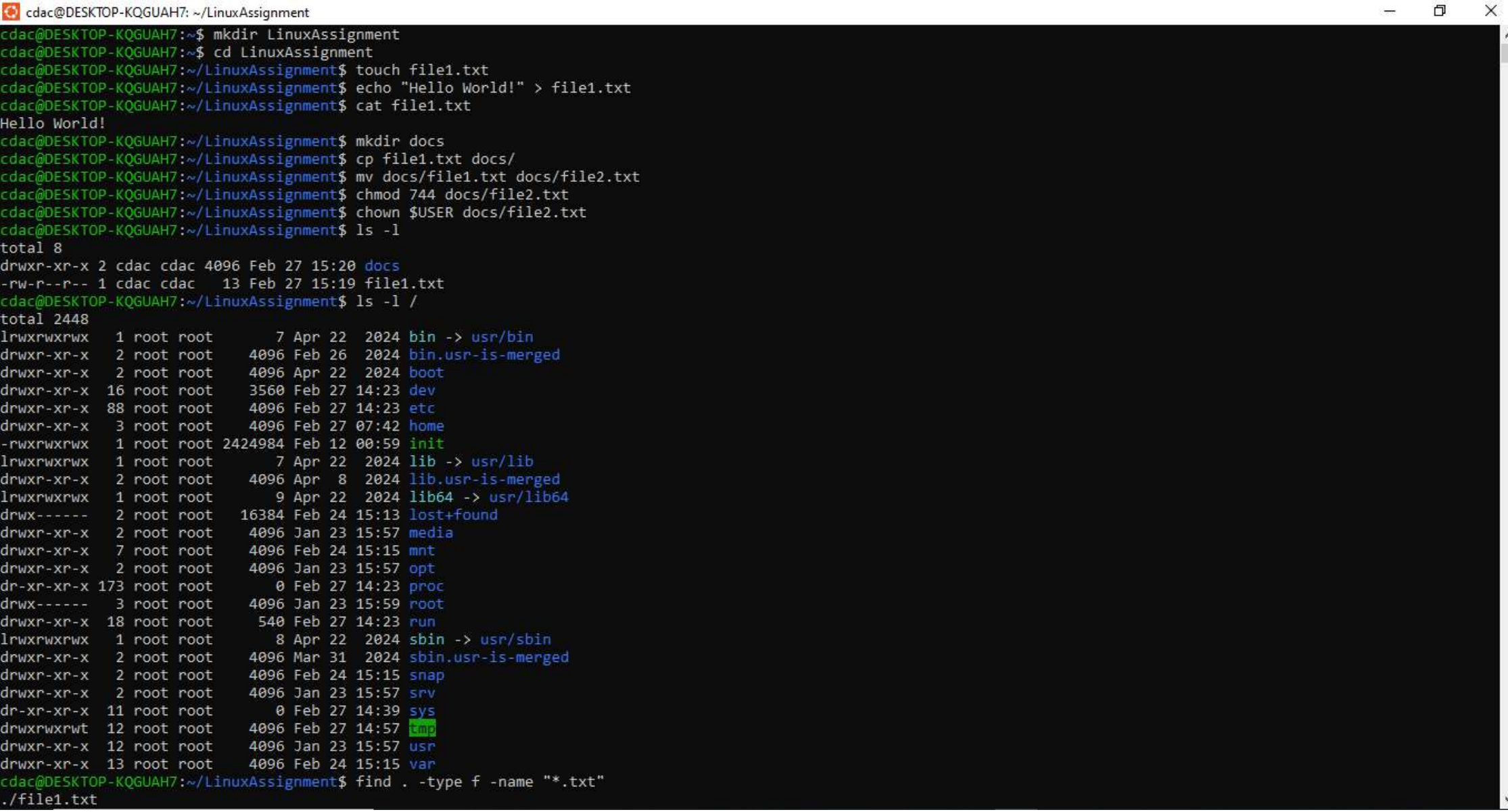
g) **File Searching:**
   a. Search for all files with the extension ".txt" in the current directory and its subdirectories.
   b. Display lines containing a specific word in a file (provide a file name and the specific word to search).

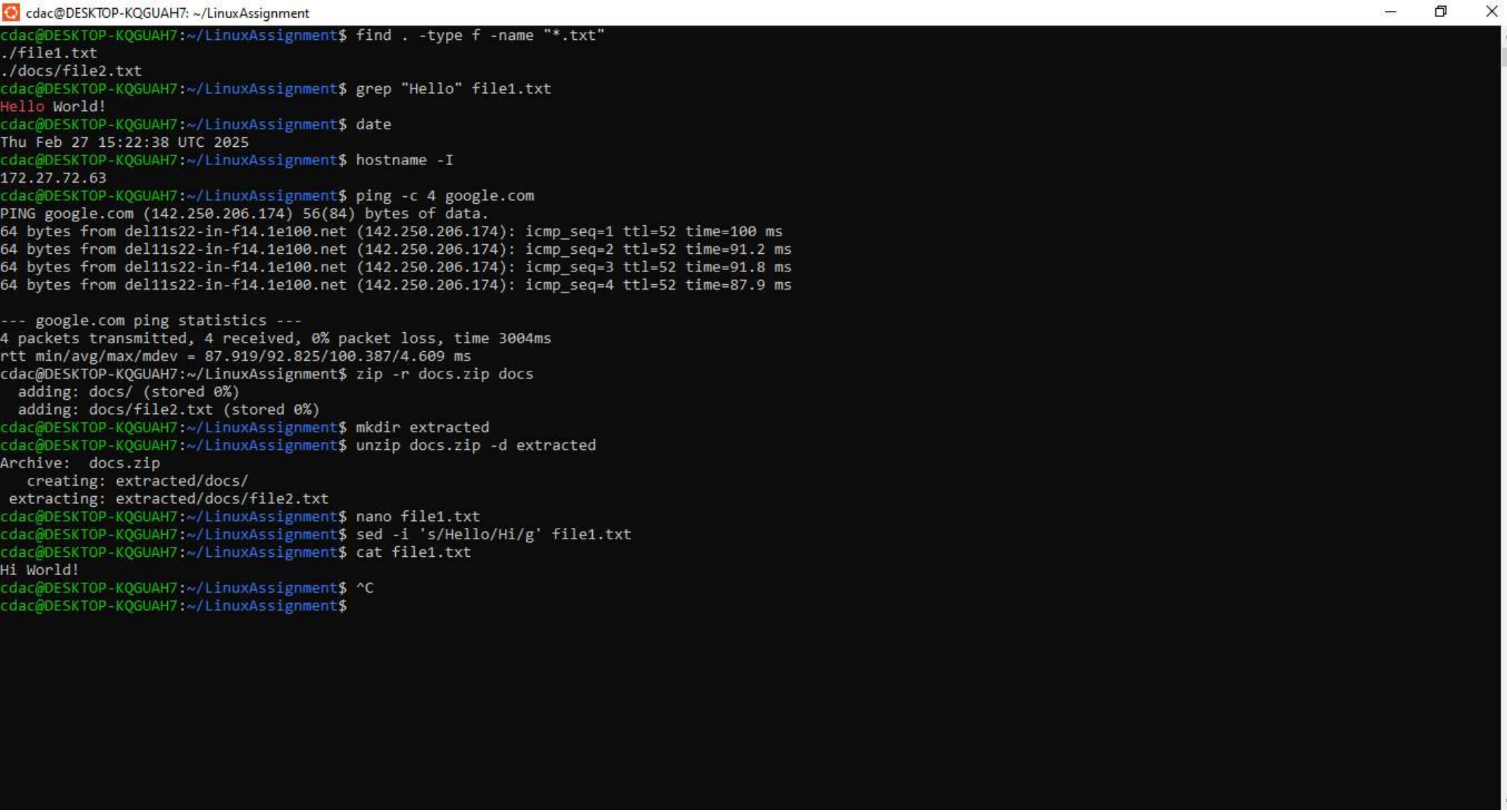
h) **System Information:**
   a. Display the current system date and time.

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).

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).


cdac@DESKTOP-KQGUAH7: ~/LinuxAssignment
cdac@DESKTOP-KQGUAH7:~$ mkdir LinuxAssignment
cdac@DESKTOP-KQGUAH7:~$ cd LinuxAssignment
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ echo "Hello World!" > file1.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ cat file1.txt
Hello World!
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ cp file1.txt docs/
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ mv docs/file1.txt docs/file2.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ chmod 744 docs/file2.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ chown $USER docs/file2.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 15:20 docs
-rw-r--r-- 1 cdac cdac   13 Feb 27 15:19 file1.txt
cdac@DESKTOP-KQGUAH7:~/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   3560 Feb 27 14:23 dev
drwxr-xr-x 88 root root   4096 Feb 27 14:23 etc
drwxr-xr-x   3 root root   4096 Feb 27 07:42 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 15:13 lost+found
drwxr-xr-x   2 root root   4096 Jan 23 15:57 media
drwxr-xr-x   7 root root   4096 Feb 24 15:15 mnt
drwxr-xr-x   2 root root   4096 Jan 23 15:57 opt
dr-xr-xr-x 173 root root   0 Feb 27 14:23 proc
drwx------   3 root root   4096 Jan 23 15:59 root
drwxr-xr-x 18 root root   540 Feb 27 14:23 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 15:15 snap
drwxr-xr-x   2 root root   4096 Jan 23 15:57 srv
dr-xr-xr-x 11 root root   0 Feb 27 14:39 sys
drwxrwxrwt 12 root root   4096 Feb 27 14:57 tmp
drwxr-xr-x 12 root root   4096 Jan 23 15:57 usr
drwxr-xr-x 13 root root   4096 Feb 24 15:15 var
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt


cdac@DESKTOP-KQGUAH7: ~/LinuxAssignment
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt
./docs/file2.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ grep "Hello" file1.txt
Hello World!
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ date
Thu Feb 27 15:22:38 UTC 2025
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ hostname -I
172.27.72.63
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ ping -c 4 google.com
PING google.com (142.250.206.174) 56(84) bytes of data.
64 bytes from del11s22-in-f14.1e100.net (142.250.206.174): icmp_seq=1 ttl=52 time=100 ms
64 bytes from del11s22-in-f14.1e100.net (142.250.206.174): icmp_seq=2 ttl=52 time=91.2 ms
64 bytes from del11s22-in-f14.1e100.net (142.250.206.174): icmp_seq=3 ttl=52 time=91.8 ms
64 bytes from del11s22-in-f14.1e100.net (142.250.206.174): icmp_seq=4 ttl=52 time=87.9 ms
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 87.919/92.825/100.387/4.609 ms
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ zip -r docs.zip docs
adding: docs/ (stored 0%)
adding: docs/file2.txt (stored 0%)
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ mkdir extracted
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ unzip docs.zip -d extracted
Archive: docs.zip
creating: extracted/docs/
extracting: extracted/docs/file2.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ sed -i 's/Hello/Hi/g' file1.txt
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ cat file1.txt
Hi World!
cdac@DESKTOP-KQGUAH7:~/LinuxAssignment$ ^C
cdac@DESKTOP-KQGUAH7:~/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.

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

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.

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

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."

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."

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."

Submission Guidelines:

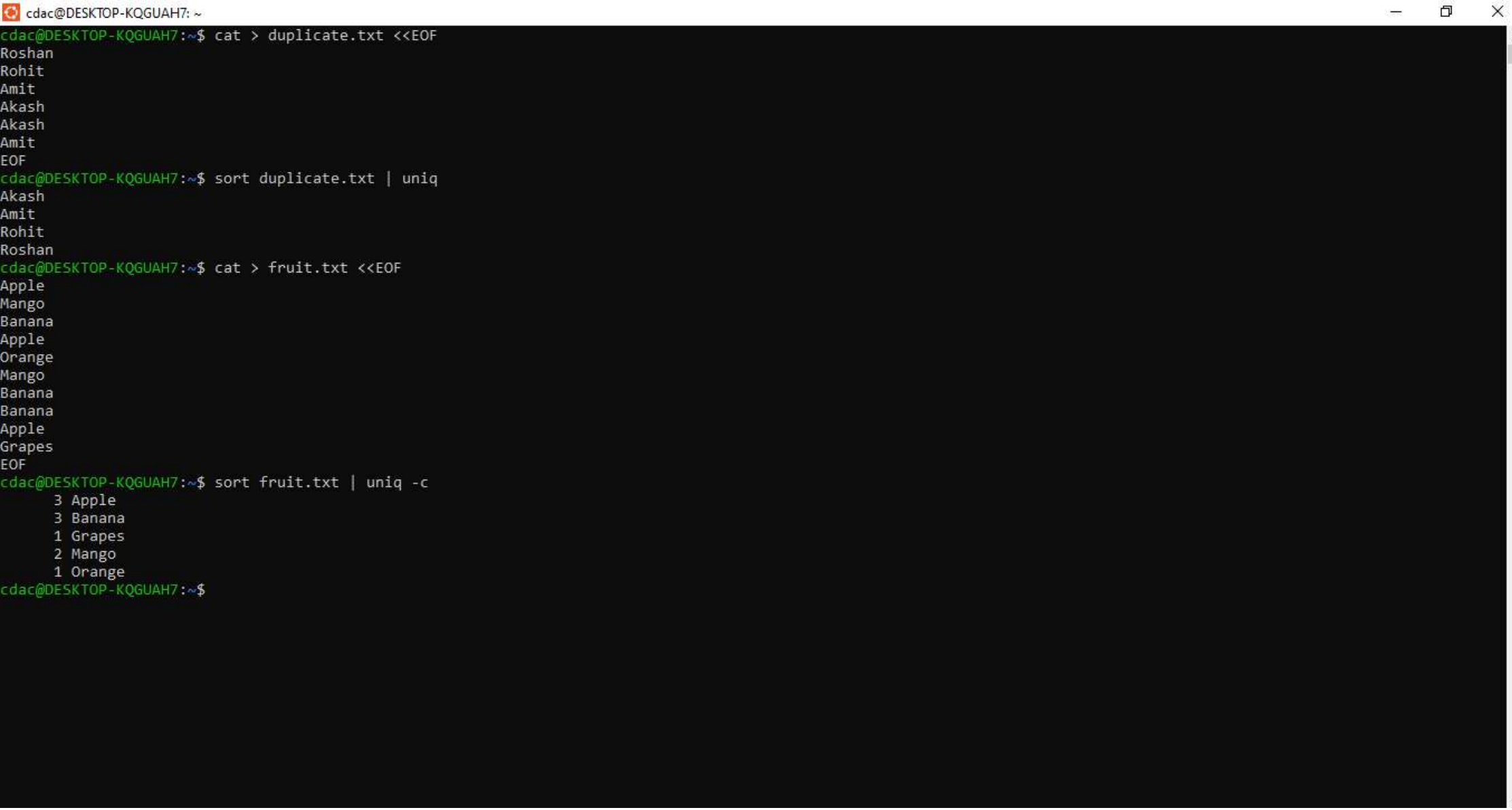
- Document each step of your solution and any challenges faced.
- Upload it on your GitHub repository

Additional Tips:

- Experiment with different options and parameters of each command to explore their functionalities.

```
cdac@DESKTOP-KQGUAH7: ~
cdac@DESKTOP-KQGUAH7:~$ nano data.txt
cdac@DESKTOP-KQGUAH7:~$ head -n 10 data.txt
Virat Kohli
Sachin Tendulkar
MS Dhoni
Rohit Sharma
Yuvraj Singh
Rahul Dravid
Sourav Ganguly
Jasprit Bumrah
Hardik Pandya
Mohammad Shami
cdac@DESKTOP-KQGUAH7:~$ tail -n 5 data.txt
Rahul Dravid
Sourav Ganguly
Jasprit Bumrah
Hardik Pandya
Mohammad Shami
cdac@DESKTOP-KQGUAH7:~$ nano numbers.txt
cdac@DESKTOP-KQGUAH7:~$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-KQGUAH7:~$ tail -n 3 numbers.txt
14
15

cdac@DESKTOP-KQGUAH7:~$ cat > input.txt <<EOF
s is a s> This is a sample text file.
> It contains lowercase letters.
> We will convert this text to uppercase.
> EOF
```


cdac@DESKTOP-KQGUAH7: ~
cdac@DESKTOP-KQGUAH7:~$ cat > duplicate.txt <<EOF
Roshan
Rohit
Amit
Akash
Akash
Amit
EOF
cdac@DESKTOP-KQGUAH7:~$ sort duplicate.txt | uniq
Akash
Amit
Rohit
Roshan
cdac@DESKTOP-KQGUAH7:~$ cat > fruit.txt <<EOF
Apple
Mango
Banana
Apple
Orange
Mango
Banana
Banana
Apple
Grapes
EOF
cdac@DESKTOP-KQGUAH7:~$ sort fruit.txt | uniq -c
3 Apple
3 Banana
1 Grapes
2 Mango
1 Orange
cdac@DESKTOP-KQGUAH7:~$