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.

```
yash@Yash-Laptop:~$ ls
yash@Yash-Laptop:~$ mkdir LinuxAssignment
yash@Yash-Laptop:~$ ls
LinuxAssignment
```

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

```
yash@Yash-Laptop:~/LinuxAssignment$ nano file1.txt
yash@Yash-Laptop:~/LinuxAssignment$ cat file1.txt
echo "Print July 2022 with Monday as first day of week"
ncal -M -my 7 2022
```

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.

```
yash@Yash-Laptop:~/LinuxAssignment$ mkdir docs
yash@Yash-Laptop:~/LinuxAssignment$ cp file1.txt docs
yash@Yash-Laptop:~/LinuxAssignment$ ls
docs  file1.txt
yash@Yash-Laptop:~/LinuxAssignment$ cd docs
yash@Yash-Laptop:~/LinuxAssignment/docs$ ls
file1.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ mv file1.txt file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ ls
file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ nano file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ cat file2.txt
echo "Print July 2022 with Monday as first day of week"
echo "Command used: ncal -M -my 7 2022"
ncal -M -my 7 2022
yash@Yash-Laptop:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r--r-- 1 yash yash 115 Feb 27 15:26 file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ chmod +x file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr-xr-x 1 yash yash 115 Feb 27 15:26 file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ chmod 744 file2.txt
yash@Yash-Laptop:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 yash yash 115 Feb 27 15:26 file2.txt
```

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

```
yash@Yash-Laptop:~/LinuxAssignment$ ls
docs  file1.txt
```

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)

```
yash@Yash-Laptop:~$ find ./LinuxAssignment -name *.txt
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
```

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).

```
yash@Yash-Laptop:~$ date
Thu Feb 27 15:32:00 UTC 2025
yash@Yash-Laptop:~$ ip addr
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
    inet 10.255.255.254/32 brd 10.255.255.254 scope global 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 1472 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:ab:f2:30 brd ff:ff:ff:ff:ff:ff
    inet 172.18.168.254/20 brd 172.18.175.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:feab:f230/64 scope link
       valid_lft forever preferred_lft forever
yash@Yash-Laptop:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=117 time=7.10 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=117 time=11.5 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=117 time=6.36 ms
^C
--- 8.8.8.8 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2115ms
rtt min/avg/max/mdev = 6.360/8.320/11.502/2.270 ms
```

j) File Compression:

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

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

```
yash@Yash-Laptop:~/LinuxAssignment$ zip docs.zip docs
  adding: docs/ (stored 0%)
yash@Yash-Laptop:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt
yash@Yash-Laptop:~/LinuxAssignment$ unzip docs.zip -d docs2
Archive:  docs.zip
   creating: docs2/docs/
yash@Yash-Laptop:~/LinuxAssignment$ ls
docs  docs.zip  docs2  file1.txt
```

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.

```
yash@Yash-Laptop:~$ head -10 data.txt
1
2
3
4
5
6
7
8
9
10
```

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

```
yash@Yash-Laptop:~$ tail -5 data.txt
16
17
18
19
20
```

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.

```
yash@Yash-Laptop:~$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

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

```
yash@Yash-Laptop:~$ tail -3 numbers.txt
18
19
20
```

s

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."

```
yash@Yash-Laptop:~$ ls
yash@Yash-Laptop:~$ read input
qwerty
yash@Yash-Laptop:~$ echo $input | sed 's/[a-z]/\U&/g' >> output
yash@Yash-Laptop:~$ cat output
QWERTY
yash@Yash-Laptop:~$
```

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."

```
yash@Yash-Laptop:~$ nano duplicate.txt
yash@Yash-Laptop:~$ cat duplicate.txt
I love music.
I love music.
I love music.

I love music 45
I love music 45
yash@Yash-Laptop:~$ uniq duplicate.txt
I love music.

I love music 45
```

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."

```
yash@Yash-Laptop:~$ cat fruit.txt
apple
apple
pear
pear
orange
yash@Yash-Laptop:~$ uniq -c fruit.txt
      2 apple
      2 pear
      1 orange
```

Challenges: had to install some packages using sudo apt install