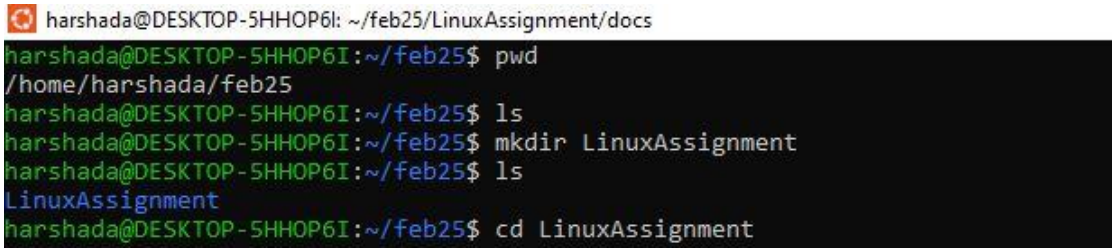
Concept of Operating System
Assignment 1

Problem 1:

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:



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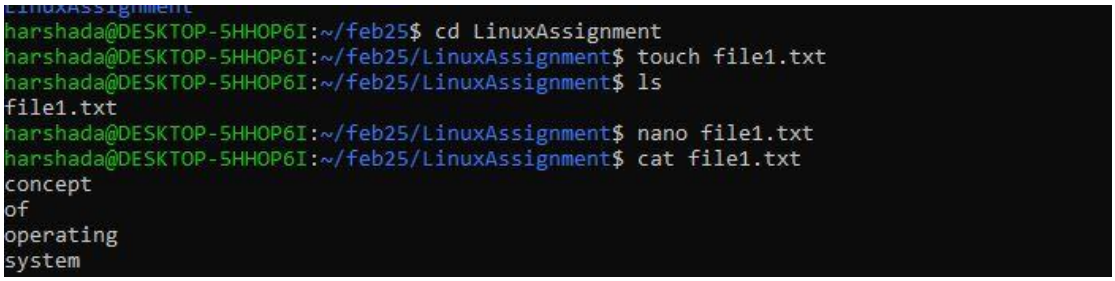
b) **File Management:**

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

Ans:



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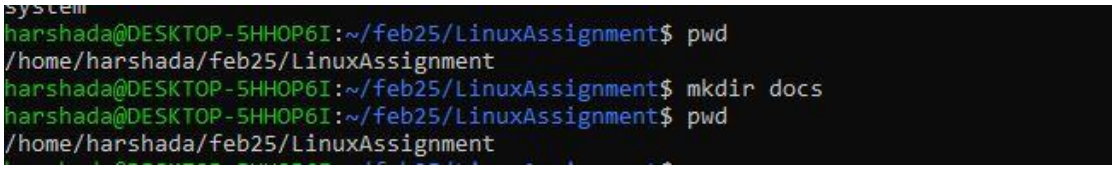
c) **Directory Management:**

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

Ans:



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d) **Copy and Move Files:**
a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".
Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cd ..
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ cp file1.txt docs/file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ cd docs
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ ls
file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat file2.txt
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```

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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.
Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ ls -l
total 0
-rw-r--r-- 1 harshada harshada 32 Feb 27 12:58 file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ chmod 744
chmod: missing operand after ‘744’
Try 'chmod --help' for more information.
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ chmod '744'
chmod: missing operand after ‘744’
Try 'chmod --help' for more information.
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ chmod 744 file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ ls -l
total 0
-rwxr--r-- 1 harshada harshada 32 Feb 27 12:58 file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ chown cdac file2.txt
chown: changing ownership of 'file2.txt': Operation not permitted
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ sudo chown cdac file2.txt
[sudo] password for harshada:
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ ls -1
file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ sudo chown cdac file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ ls -1
file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ ls -l
total 0
-rwxr--r-- 1 cdac harshada 32 Feb 27 12:58 file2.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$
```

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f) **Final Checklist:**

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

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cd ..
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ ls
docs  file1.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ cd
harshada@DESKTOP-5HHOP6I:~$ ls
feb25
```

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g) **File Searching:**

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

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ find . -type f -name '*.txt'
./duplicate.txt
./file2.txt
./file3.txt
./fruit.txt
./input.txt
./output.txt
```

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

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ grep "operating" file1.txt
operating
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$
```

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h) **System Information:**

a. Display the current system date and time.

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ date "+%Y-%m-%d %H:%M:%S"
2025-02-28 13:49:46
```

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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).

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ hostname -I | awk '{print $1}'
192.168.29.115
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ ping google.com
PING google.com (2404:6800:4009:81f::200e) 56 data bytes
64 bytes from bom07s29-in-x0e.1e100.net (2404:6800:4009:81f::200e): icmp_seq=1 ttl=118 time=9.84 ms
64 bytes from bom07s29-in-x0e.1e100.net (2404:6800:4009:81f::200e): icmp_seq=2 ttl=118 time=8.56 ms
64 bytes from bom07s29-in-x0e.1e100.net (2404:6800:4009:81f::200e): icmp_seq=3 ttl=118 time=6.79 ms
64 bytes from bom07s29-in-x0e.1e100.net (2404:6800:4009:81f::200e): icmp_seq=4 ttl=118 time=7.95 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3003ms
rtt min/avg/max/mdev = 6.789/8.283/9.837/1.099 ms
```

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j) **File Compression:**

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

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/duplicate.txt (deflated 21%)e-updates/main amd64 unzip amd64 6.0-28ubuntu4.1 [174 kB]
  adding: docs/file2.txt (stored 0%)tu noble-updates/main amd64 zip amd64 3.0-13ubuntu0.2 [176 kB]
  adding: docs/file3.txt (stored 0%)
  adding: docs/file3.txt.save (deflated 35%)
  adding: docs/fruit.txt (deflated 21%)
  adding: docs/input.txt (deflated 8%)
  adding: docs/output.txt (deflated 7%)
```

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

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ mkdir new_directory
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ unzip docs.zip -d new_directory
Archive:  docs.zip
   creating: new_directory/docs/
  inflating: new_directory/docs/duplicate.txt
 extracting: new_directory/docs/file2.txt
 extracting: new_directory/docs/file3.txt
  inflating: new_directory/docs/file3.txt.save
  inflating: new_directory/docs/fruit.txt
  inflating: new_directory/docs/input.txt
  inflating: new_directory/docs/output.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ ls
data.txt  docs  docs.zip  file1.txt  file3.txt  new_directory  numbers.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$
```

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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).

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ sed -i 's/systemtem/system/g' file1.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ cat file1.txt
concept
of
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```

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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.

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ touch data.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ nano data.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ cat data.txt
jan
feb
mar
apri
may
jun
july
aug
sep
oct
nov
dec
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ head -10  data.txt
jan
feb
mar
apri
may
jun
july
aug
sep
oct
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$
```

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

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ tail -5 data.txt
aug
sep
oct
nov
dec
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$
```

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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.

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ nano numbers.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

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

Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ nano numbers.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment$ tail -3 numbers.txt
16
17
18
```

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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."
Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ touch input.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ nano input.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat input.txt | tr [:lower:] [:upper:] > output.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat input.txt | tr [:lower:] [:upper:] > output.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat output.txt
OPERATING SYSTEM IS A INTERFACE BETWEEN USER AND HARDWARE
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat input.txt
operating system is a interface between user and hardware
```

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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."
Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ touch duplicate.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ nano duplicate.txt
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat duplicate.txt | sort | uniq
harshada
kedar
omkar
shravani
shubham
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$
```

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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."
Output:

```
harshada@DESKTOP-5HHOP6I:~/feb25/LinuxAssignment/docs$ cat fruit.txt | sort | uniq -c
      2 apple
      1 banana
      2 mango
      1 orange
```

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