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.

Code:
saif_ubuntu@Mohammad-Saif-s-PC:~$ mkdir LinuxAssignment

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

Code:
saif_ubuntu@Mohammad-Saif-s-PC:~$ cd LinuxAssignment
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ touch file1.txt
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ nano file1.txt
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ cat file1.txt
"Why are you here?" and "What are you living for?"

This is also about the meaning of life and your calling. The answer to these questions will give you lasting motivation and direction and strength for your.

And this will touch you much deeper than all the motivational speeches, self-motivation techniques, motivational quotes etc.
If you really want to go deeper, then check out the following motivational message for yourself!

The following message has already fundamentally changed the lives of billions* of people.

Your life can change forever for the better!

Take this time, because it's worth it… It takes only a few minutes!
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$

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

Code:
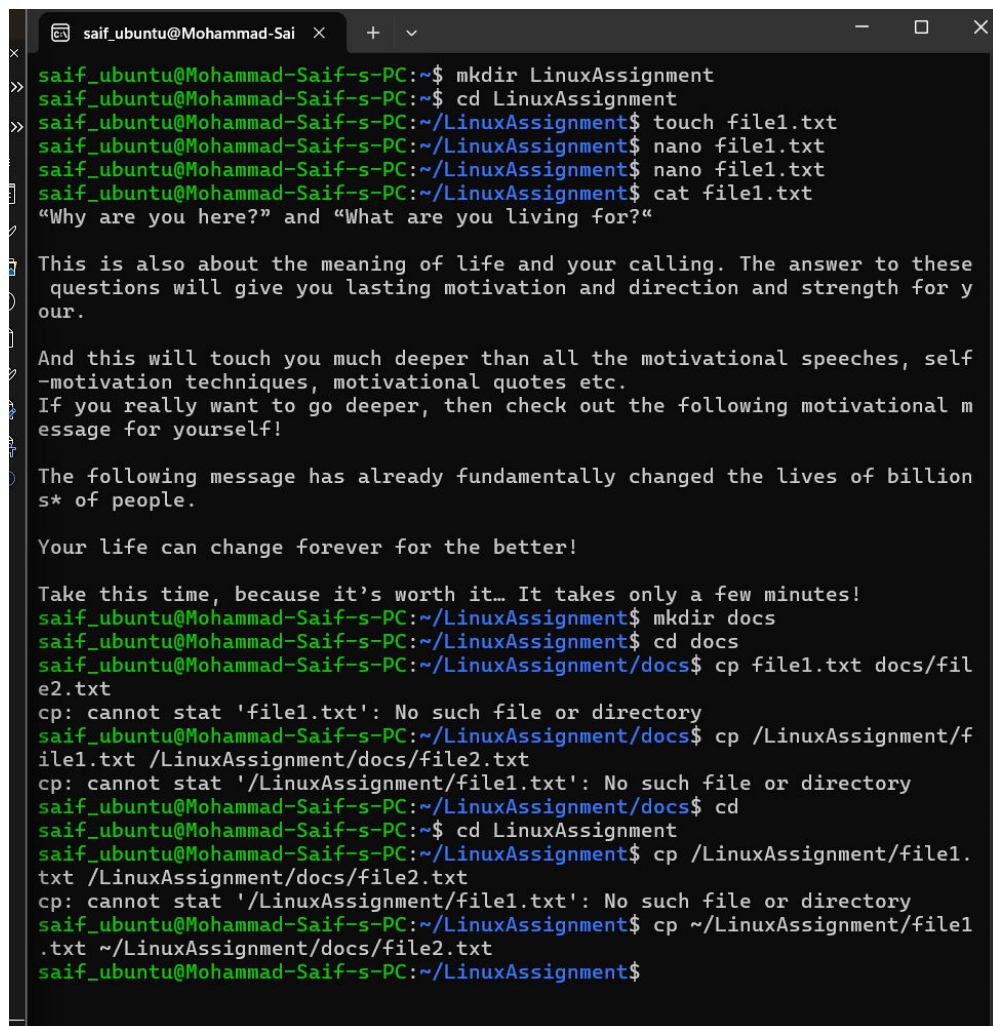saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ mkdir docs

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

Code:

saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ cp ~/LinuxAssignment/file1.txt ~/LinuxAssignment/docs/file2.txt

Shell till now :

e) Permissions and Ownership:
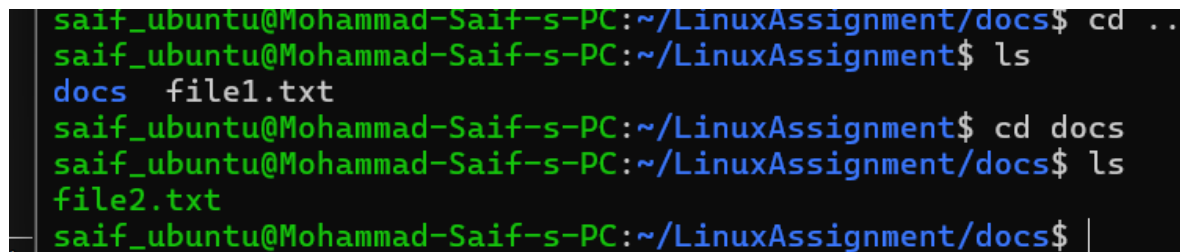
a. Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others. Then, change the owner of "file2.txt" to the current user.

Code:

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ cd docs
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment/docs$ chmod 744 file2.txt
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 saif_ubuntu saif_ubuntu 650 Feb 26 22:26 file2.txt
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment/docs$ chown $(whoami) file2
.txt
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 saif_ubuntu saif_ubuntu 650 Feb 26 22:26 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.

g) File Searching:

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

Code:
```
saif_ubuntu@Mohammad-Saif-s-PC:~$ find . -type f -name "*.txt"
./LinuxAssignment/docs/file2.txt
```

./LinuxAssignment/file1.txt

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

Search to Display – "the" File name file1.txt

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ grep -n "the" file1.txt
3:This is also about the meaning of life and your calling. The answer to ths
e questions will give you lasting motivation and direction and strength for
your.
5:And this will touch you much deeper than all the motivational speeches, se
lf-motivation techniques, motivational quotes etc.
6:If you really want to go deeper, then check out the following motivational
 message for yourself!
8:The following message has already fundamentally changed the lives of billi
ons* of people.
10:Your life can change forever for the better!
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$
```

without case sensitive:

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ grep -ni "the" file1.txt
3:This is also about the meaning of life and your calling. The answer to ths
e questions will give you lasting motivation and direction and strength for
your.
5:And this will touch you much deeper than all the motivational speeches, se
lf-motivation techniques, motivational quotes etc.
6:If you really want to go deeper, then check out the following motivational
 message for yourself!
8:The following message has already fundamentally changed the lives of billi
ons* of people.
10:Your life can change forever for the better!
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$
```

h) System Information:

a. Display the current system date and time.

Code:

saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ date

Wed Feb 26 23:07:57 IST 2025

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ date
Wed Feb 26 23:07:57 IST 2025
```

i) Networking:

a. Display the IP address of the system.

saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ ip a

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group de
fault 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 1400 qdisc mq state UP group
default qlen 1000
    link/ether 00:15:5d:f8:f6:52 brd ff:ff:ff:ff:ff:ff
    inet 172.23.222.46/20 brd 172.23.223.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fef8:f652/64 scope link
       valid_lft forever preferred_lft forever
```

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

Code:
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ ping -c 2 google.com
PING google.com (142.251.42.46) 56(84) bytes of data.
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=1 ttl=52 time=93.4 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=2 ttl=52 time=83.7 ms

--- google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1021ms
rtt min/avg/max/mdev = 83.698/88.534/93.371/4.836 ms

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ ping -c 2 google.com
PING google.com (142.251.42.46) 56(84) bytes of data.
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=1 ttl=52 t
ime=93.4 ms
64 bytes from bom12s20-in-f14.1e100.net (142.251.42.46): icmp_seq=2 ttl=52 t
ime=83.7 ms

--- google.com ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1021ms
rtt min/avg/max/mdev = 83.698/88.534/93.371/4.836 ms
```

j) File Compression:
a. Compress the "docs" directory into a zip file.

saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (deflated 44%)

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (deflated 44%)
```

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

saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ unzip docs.zip -d docs2
Archive: docs.zip
   creating: docs2/docs/
  inflating: docs2/docs/file2.txt

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ unzip docs.zip -d docs2
Archive:  docs.zip
   creating: docs2/docs/
  inflating: docs2/docs/file2.txt
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$
```
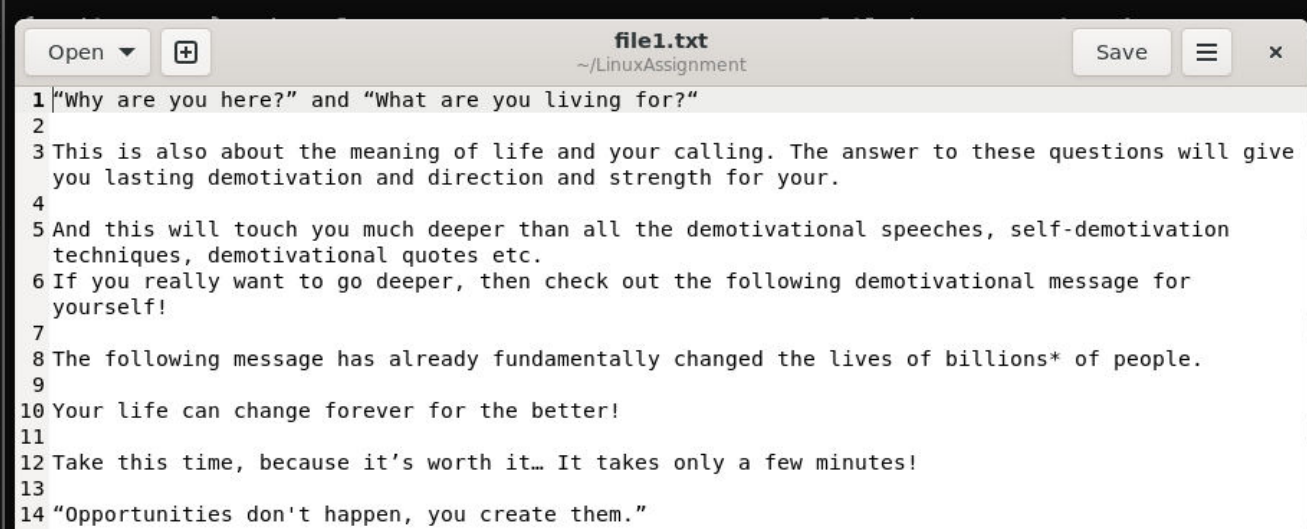
k) File Editing:
a. Open the "file1.txt" file in a text editor and add some text to it.

b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ sed -i 's/motivation/demotivation/g' file1.txt

```
saif_ubuntu@Mohammad-Saif-s-PC:~/LinuxAssignment$ gedit file1.txt
```

Open ▾	⊞		file1.txt		Save	≡	✕
			~/LinuxAssignment				

```
 1 "Why are you here?" and "What are you living for?"
 2
 3 This is also about the meaning of life and your calling. The answer to these questions will give
   you lasting demotivation and direction and strength for your.
 4
 5 And this will touch you much deeper than all the demotivational speeches, self-demotivation
   techniques, demotivational quotes etc.
 6 If you really want to go deeper, then check out the following demotivational message for
   yourself!
 7
 8 The following message has already fundamentally changed the lives of billions* of people.
 9
10 Your life can change forever for the better!
11
12 Take this time, because it's worth it… It takes only a few minutes!
13
14 "Opportunities don't happen, you create them."
```

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.

Code: head -10 data.txt

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

Code : tail -5 data.text

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.
Code : head -15 numbers.txt
d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".
Code : tail -3 numbers.text

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."

Code: tr '[:lower:]' '[:upper:]' < input.txt > 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."

Code: sort duplicate.txt | uniq

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."
Code : sort fruit.txt | uniq -c