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.

```
cdac@DESKTOP-S7QM7LP: ~/                                    —    □    ✕

total 4
-rw-r--r-- 1 cdac cdac 26 Aug 28 18:32 file2.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ chmod u+rwx file2.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 26 Aug 28 18:32 file2.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ chown file2.txt u
chown: invalid user: 'file2.txt'
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ chown file2.txt cdac
chown: invalid user: 'file2.txt'
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ chown cdac file2.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 26 Aug 28 18:32 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.

```
cdac@DESKTOP-S7QM7LP: ~                                      —    □    ✕

cdac@DESKTOP-S7QM7LP:~$ cd home/
cdac@DESKTOP-S7QM7LP:~/home$ cd LinuxAssignment/
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:34 docs
-rw-r--r-- 1 cdac cdac   26 Aug 28 18:24 file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cd docs
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 26 Aug 28 18:32 file2.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cd ..
cdac@DESKTOP-S7QM7LP:~/home$ cd ..
cdac@DESKTOP-S7QM7LP:~$ ls -l
total 4
drwxr-xr-x 3 cdac cdac 4096 Aug 28 18:07 home
-rw-r--r-- 1 cdac cdac    0 Aug 27 21:09 test.txt
cdac@DESKTOP-S7QM7LP:~$
```

g) **File Searching:**

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

```
cdac@DESKTOP-S7QM7LP: ~                                      —    □    ✕

cdac@DESKTOP-S7QM7LP:~$ find . -type f -name "*.txt"
./test.txt
./home/LinuxAssignment/docs/file2.txt
./home/LinuxAssignment/file1.txt
cdac@DESKTOP-S7QM7LP:~$
```

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

```
cdac@DESKTOP-S7QM7LP:~$ cd home/
cdac@DESKTOP-S7QM7LP:~/home$ cd LinuxAssignment/
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 18:34 docs
-rw-r--r-- 1 cdac cdac   26 Aug 28 18:24 file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ grep "Harshali" file1.txt
Harshali here.
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$
```

h) **System Information:**

    a. Display the current system date and time.

```
cdac@DESKTOP-S7QM7LP: ~                                      —    □    ✕

cdac@DESKTOP-S7QM7LP:~$ date
Wed Aug 28 19:15:17 IST 2024
cdac@DESKTOP-S7QM7LP:~$
```

i) **Networking:**
   a. Display the IP address of the system.

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.212.149  netmask 255.255.240.0  broadcast 192.168.223.255
        inet6 fe80::215:5dff:fe57:76b5  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:57:76:b5  txqueuelen 1000  (Ethernet)
        RX packets 236  bytes 249274 (249.2 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 115  bytes 13872 (13.8 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 14  bytes 1692 (1.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 14  bytes 1692 (1.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

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

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ ping amazon.com
PING amazon.com (54.239.28.85) 56(84) bytes of data.
64 bytes from 54.239.28.85: icmp_seq=1 ttl=239 time=307 ms
64 bytes from 54.239.28.85: icmp_seq=2 ttl=239 time=227 ms
64 bytes from 54.239.28.85: icmp_seq=3 ttl=239 time=210 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=4 ttl=239 time=215 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=5 ttl=239 time=245 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=6 ttl=239 time=262 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=7 ttl=239 time=285 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=8 ttl=239 time=309 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=9 ttl=239 time=231 ms
64 bytes from 54.239.28.85 (54.239.28.85): icmp_seq=10 ttl=239 time=253 ms
^C
--- amazon.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9781ms
rtt min/avg/max/mdev = 210.293/254.365/308.711/34.075 ms
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$
```

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

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ zip -r name_of_zip_file.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (deflated 4%)
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$
```
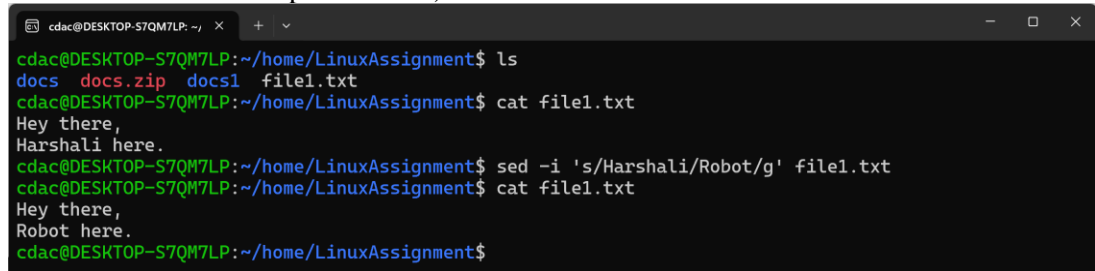
   b. Extract the contents of the zip file into a new directory.

```
S7QM7LP:~/home/LinuxAssignment$ mkdir docs1
S7QM7LP:~/home/LinuxAssignment$ ls
p  docs1  file1.txt
S7QM7LP:~/home/LinuxAssignment$ unzip docs.zip -d docs1
s.zip
docs1/docs/
docs1/docs/file2.txt
S7QM7LP:~/home/LinuxAssignment$ ls
p  docs1  file1.txt
S7QM7LP:~/home/LinuxAssignment$ cd docs1
S7QM7LP:~/home/LinuxAssignment/docs1$ ls

S7QM7LP:~/home/LinuxAssignment/docs1$
```

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-S7QM7LP:~/home/LinuxAssignment$ ls
docs   docs.zip   docs1   file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cat file1.txt
Hey there,
Harshali here.
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ sed -i 's/Harshali/Robot/g' file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cat file1.txt
Hey there,
Robot here.
cdac@DESKTOP-S7QM7LP:~/home/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.

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ ls
docs  docs.zip  docs1  file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cat file1.txt
Hey there,
Harshali here.
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ sed -i 's/Harshali/Robot/g' file1.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cat file1.txt
Hey there,
Robot here.
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ nano data.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ head -10 data.txt
The name of my country is India.
India is also known as Hindustan.
The capital of India is New Delhi.
India is a very beautiful country.
It is located in the continent of Asia.
There are 28 states and 8 union territories in my country.
The currency of India is the Indian Rupee.
India is a diverse country.
India is famous for its iconic monuments like the Taj Mahal, Qutub Minar and,many more.
It is the seventh-largest country in the world and has seven neighboring countries.
cdac@DESKTOP-S7QM7LP:~/home/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.

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ tail -5 data.txt
There are 28 states and 8 union territories in my country.
The currency of India is the Indian Rupee.
India is a diverse country.
India is famous for its iconic monuments like the Taj Mahal, Qutub Minar and,many more.
It is the seventh-largest country in the world and has seven neighboring countries.
cdac@DESKTOP-S7QM7LP:~/home/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.

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$
```

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

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ tail -5 numbers.txt
11
12
13
14
15
cdac@DESKTOP-S7QM7LP:~/home/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."

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ nano input.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ touch output.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ tr 'a-z' 'A-Z' <input.txt > output.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ nano output.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ cat output.txt
HELLO THERE
HARSHALI HERE.
HAVE A GOOD DAY
BYE
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$
```

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."

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ nano duplicate.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ sort duplicate.txt | uniq
hello
hi
cdac@DESKTOP-S7QM7LP:~/home/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."

```
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ nano fruits.txt
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$ sort fruits.txt | uniq -c
      5 apple
      1 banana
      1 chikoo
      1 guava
      5 mango
      3 orange
      2 pineapple
cdac@DESKTOP-S7QM7LP:~/home/LinuxAssignment$
```

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.