Concepts 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.

```
cdac@Farah:~$ pwd
/home/cdac
cdac@Farah:~$ ls
Problem2
cdac@Farah:~$ mkdir LinuxAssignment
cdac@Farah:~$ cd LinuxAssignment
cdac@Farah:~/LinuxAssignment$
```

b) File Management:

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

```
cdac@Farah:~/LinuxAssignment$ nano file1.txt
cdac@Farah:~/LinuxAssignment$ cat file1.txt
Hello!
Hey!
Hola!
cdac@Farah:~/LinuxAssignment$
```

c) Directory Management:

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

```
cdac@Farah:~/LinuxAssignment$ mkdir Docs
cdac@Farah:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@Farah:~/LinuxAssignment$
```

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

```
cdac@Farah:~/LinuxAssignment$ cp file1.txt Docs
cdac@Farah:~/LinuxAssignment$ ls
Docs  file1.txt
cdac@Farah:~/LinuxAssignment$ cd Docs
cdac@Farah:~/LinuxAssignment/Docs$ ls
file1.txt
cdac@Farah:~/LinuxAssignment/Docs$ mv file1.txt file2.txt
cdac@Farah:~/LinuxAssignment/Docs$ ls
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@Farah:~/LinuxAssignment/Docs$ sudo adduser user1
[sudo] password for cdac:
Adding user `user1' ...
Adding new group `user1' (1001) ...
Adding new user `user1' (1001) with group `user1' ...
Creating home directory `/home/user1' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for user1
Enter the new value, or press ENTER for the default
        Full Name []: Farah Khan
        Room Number []: 4
        Work Phone []: 9754646557
        Home Phone []: 9179883982
        Other []: 000
Is the information correct? [Y/n] y
cdac@Farah:~/LinuxAssignment/Docs$ su user1
Password:
user1@Farah:/home/cdac/LinuxAssignment/Docs$ cat file.txt
cat: file.txt: No such file or directory
user1@Farah:/home/cdac/LinuxAssignment/Docs$ su cdac
Password:
cdac@Farah:~/LinuxAssignment/Docs$ chmod o+wx file2.txt
cdac@Farah:~/LinuxAssignment/Docs$ ls -l
total 4
-rwxrwxrwx 1 cdac cdac 18 Aug 30 14:01 file2.txt
cdac@Farah:~/LinuxAssignment/Docs$ su user1
Password:
su: Authentication failure
cdac@Farah:~/LinuxAssignment/Docs$ su user1
Password:
user1@Farah:/home/cdac/LinuxAssignment/Docs$ ls -l
total 4
-rwxrwxrwx 1 cdac cdac 18 Aug 30 14:01 file2.txt
user1@Farah:/home/cdac/LinuxAssignment/Docs$
```

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@Farah:~/LinuxAssignment$ ls
Docs  file.txt  file1.txt
```

```
cdac@Farah:~/LinuxAssignment/Docs$ ls
docs.zip  file2.txt  newDirc
```

g) File Searching:

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

```
cdac@Farah:~/LinuxAssignment/Docs$ find . -type f -name "*.txt"
./file2.txt
```

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

```
cdac@Farah:~/LinuxAssignment$ grep "Bonjour!" file1.txt
Bonjour!
cdac@Farah:~/LinuxAssignment$ grep -r "Ciao!"
file1.txt:Ciao!
file.txt:Ciao!
```

h) System Information:

a. Display the current system date and time.

```
cdac@Farah:~$ date
Fri Aug 30 14:09:52 IST 2024
```

i) Networking:

a. Display the IP address of the system.

```
cdac@Farah:~$ hostname -I
172.17.54.84
```

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

```
cdac@Farah:~$ ping google.com
PING google.com (142.250.207.206) 56(84) bytes of data.
64 bytes from del12s10-in-f14.1e100.net (142.250.207.206): icmp_seq=1 ttl=58 time=27.6 ms
64 bytes from del12s10-in-f14.1e100.net (142.250.207.206): icmp_seq=2 ttl=58 time=28.0 ms
64 bytes from del12s10-in-f14.1e100.net (142.250.207.206): icmp_seq=3 ttl=58 time=28.3 ms
```

j) File Compression:

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

```
cdac@Farah:~/LinuxAssignment/Docs$ zip -r docs . -i docs
        zip warning: zip file empty
```

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

```
cdac@Farah:~/LinuxAssignment/Docs$ mkdir newDirc
cdac@Farah:~/LinuxAssignment/Docs$ ls
docs.zip  file2.txt  newDirc
```

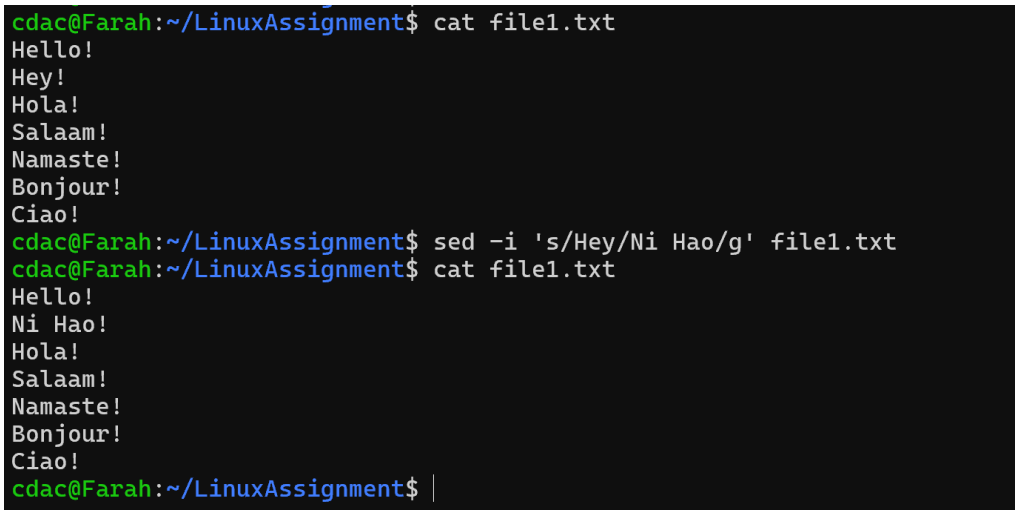
```
cdac@Farah:~/LinuxAssignment/Docs$ unzip docs.zip -d newDirc
Archive:  docs.zip
warning [docs.zip]:  zipfile is empty
```

k) File Editing:

a. Open the "file1.txt" file in a text editor and add some text to it.

```
cdac@Farah:~$ cd LinuxAssignment
cdac@Farah:~/LinuxAssignment$ cat file1.txt
Hello!
Hey!
Hola!
cdac@Farah:~/LinuxAssignment$ nano file1.txt
cdac@Farah:~/LinuxAssignment$ cat file1.txt
Hello!
Hey!
Hola!
Salaam!
Namaste!
Bonjour!
Ciao!
```

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



Problem 2:

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@Farah:~$ mkdir Problem2
cdac@Farah:~$ cd Problem2
cdac@Farah:~/Problem2$ nano data.txt
cdac@Farah:~/Problem2$ head data.txt
1. Suppose
2. you
3. have
4 a
5 file
6 named
7 "data.txt"
8 containing
9 important
10 information.
```

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@Farah:~/Problem2$ tail -5 data.txt
13. first 10
14. lines
15. of
16.this
17. file.
cdac@Farah:~/Problem2$ nano data.txt
cdac@Farah:~/Problem2$ tail -5 data.txt
16.this
17. file.
18. New
19. Data
20. added.
```

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@Farah:~/Problem2$ nano numbers.txt
cdac@Farah:~/Problem2$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

Experiment with different options and parameters –

we can display any numbers of lines by using -n.

```
cdac@Farah:~/Problem2$ nano numbers.txt
cdac@Farah:~/Problem2$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@Farah:~/Problem2$ head -n 16 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
```

```
cdac@Farah:~/Problem2$ head -n 13 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
```

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

```
cdac@Farah:~/Problem2$ tail -3 numbers.txt
14
15
16
```

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@Farah:~/Problem2$ nano input.txt
cdac@Farah:~/Problem2$ cat input.txt
This is Example of converting all lowercase letters to UPPERCASE letters and stored in an new file named output.txt
cdac@Farah:~/Problem2$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@Farah:~/Problem2$ ls
data.txt  input.txt  numbers.txt  output.txt
cdac@Farah:~/Problem2$ cat output.txt
THIS IS EXAMPLE OF CONVERTING ALL LOWERCASE LETTERS TO UPPERCASE LETTERS AND STORED IN AN NEW FILE NAMED OUTPUT.TXT
cdac@Farah:~/Problem2$ cat input.txt
This is Example of converting all lowercase letters to UPPERCASE letters and stored in an 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."

```
cdac@Farah:~/Problem2$ nano duplicate.txt
cdac@Farah:~/Problem2$ sort duplicate.txt | uniq
Cdac Mumbai
DAC
Ditis
This is the example to show unique lines-
cdac@Farah:~/Problem2$ cat duplicate.txt
This is the example to show unique lines-
Cdac Mumbai
DAC
Ditis
DAC
Cdac Mumbai
```

g. In a file named "fruit.txt," there is a list of fruits, but some fruits are repeated. Use a command