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.

```
cdac@DESKTOP-PU2COUJ:~$ pwd
/home/cdac
cdac@DESKTOP-PU2COUJ:~$  ls
Day1   LinuxAssignment   abc.txt   file1.txt   file2.txt
cdac@DESKTOP-PU2COUJ:~$ cd LinuxAssignment
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-PU2COUJ:~$ cd LinuxAssignment
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cat file1.txt
Hii
hello
how are you
i am fine
very well
good
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs    file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cp file1.txt
cp: missing destination file operand after 'file1.txt'
Try 'cp --help' for more information.
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs    file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cd docs
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$
```

d) Copy and Move Files:

 a. Copy the "file1.txt" file into the "docs" directory and rename it to "file2.txt".

```
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs    file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cp file1.txt
cp: missing destination file operand after 'file1.txt'
Try 'cp --help' for more information.
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs    file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cd docs
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$
```

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

```
docs    file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cd docs
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls -l
total 0
-rw-rw-rw- 1 cdac cdac 54 Aug 30 16:49 file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ chmod u+wxr file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls -l
total 0
-rwxrw-rw- 1 cdac cdac 54 Aug 30 16:49 file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ chmod o-wx file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls -l
total 0
-rwxrw-r-- 1 cdac cdac 54 Aug 30 16:49 file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$
```

```
-rwxrw-r-- 1 cdac cdac 54 Aug 30 16:49 file2.txt
user2@DESKTOP-PU2COUJ:/home/cdac/LinuxAssignment/docs$ sudo chown user1 file2.txt
[sudo] password for user2:
user2 is not in the sudoers file.  This incident will be reported.
user2@DESKTOP-PU2COUJ:/home/cdac/LinuxAssignment/docs$ su cdac
Password:
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ sudo chown user2 file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment/docs$ ls -l
total 0
-rwxrw-r-- 1 user2 cdac 54 Aug 30 16:49 file2.txt
cdac@DESKTOP-PU2COUJ:~/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@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs    file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls -l
total 0
drwxrwxrwx 1 cdac cdac 512 Aug 30 16:49 docs
-rw-rw-rw- 1 cdac cdac  54 Aug 30 16:33 file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cd
cdac@DESKTOP-PU2COUJ:~$ pwd
/home/cdac
cdac@DESKTOP-PU2COUJ:~$ ls
Day1    LinuxAssignment    abc.txt    file1.txt    file2.txt
cdac@DESKTOP-PU2COUJ:~$ ls -l
total 0
drwxrwxrwx 1 cdac cdac 512 Aug 30 11:37 Day1
drwxrwxrwx 1 cdac cdac 512 Aug 30 16:34 LinuxAssignment
-rw-rw-rw- 1 cdac cdac  13 Aug 29 22:46 abc.txt
-rw-rw-rw- 1 cdac cdac   0 Aug 29 22:50 file1.txt
-rwxrwxr-- 1 cdac cdac   0 Aug 29 22:51 file2.txt
cdac@DESKTOP-PU2COUJ:~$
```

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).

```
cdac@DESKTOP-PU2COUJ:~$ find . -type f -name "*.txt"
./Day1/D2/pd1.txt
./Day1/file3.txt
./Day1/pd.txt
./File3.txt
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
./abc.txt
./addition.txt
./armstrong.txt
./data.txt
./f1.txt
./file1.txt
./file2.txt
./new_file.txt
./shellprogramming/ab.txt
./shellprogramming/data.txt
./shellprogramming/file1.txt
./shellprogramming/file2.txt
./shellprogramming/input.txt
./shellprogramming/numbers.txt
./shellprogramming/output.txt
./shellprogramming/pd.txt
./shellprogramming/pdop.txt
./shellprogramming/practise/shree.txt
./unique_ips.txt
cdac@DESKTOP-PU2COUJ:~$ grep Exceptional data.txt
Exceptional
Exceptional
cdac@DESKTOP-PU2COUJ:~$
```

h) System Information:
 a. Display the current system date and time.

```
cdac@DESKTOP-PU2COUJ:~$ date
Sat Aug 31 01:34:27 DST 2024
cdac@DESKTOP-PU2COUJ:~$ date
Sat Aug 31 01:34:35 DST 2024
cdac@DESKTOP-PU2COUJ:~$
```

j) File Compression:

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

```
cdac@DESKTOP-PU2COUJ:~$ cd LinuxAssignment
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs   file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (deflated 7%)
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs   docs.zip  file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ mkdir docs_extracted
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ unzip docs.zip -d docs_extracted
Archive:  docs.zip
   creating: docs_extracted/docs/
  inflating: docs_extracted/docs/file2.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ ls
docs   docs.zip  docs_extracted   file1.txt
cdac@DESKTOP-PU2COUJ:~/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).

```
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$  sed -i s/TATA/Bye/g file1.txt
cdac@DESKTOP-PU2COUJ:~/LinuxAssignment$ cat file1.txt
hii
hello
how are you doing
i'm doing well
good
Bye bye

cdac@DESKTOP-PU2COUJ:~/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-PU2COUJ:~$ nano data.txt
cdac@DESKTOP-PU2COUJ:~$ head -n 10 data.txt
Brilliant
Stellar
Terrific
Impressive
Wonderful
Admirable
Superb
Incredible
Lovely
Magnificent
cdac@DESKTOP-PU2COUJ:~$
```

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-PU2COUJ:~$ tail -n 5 data.txt
Fabulous
Remarkable
Brilliant
Amazing
Exceptional
cdac@DESKTOP-PU2COUJ:~$
```

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-PU2COUJ:~$ nano numbers.txt
cdac@DESKTOP-PU2COUJ:~$ head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-PU2COUJ:~$
```

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

```
cdac@DESKTOP-PU2COUJ:~$ nano numbers.txt
cdac@DESKTOP-PU2COUJ:~$ tail -n 3 numbers.txt
20
21
```

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-PU2COUJ:~$ nano input.txt
cdac@DESKTOP-PU2COUJ:~$ tr [a-z] [A-Z] <input.txt> output.txt
cdac@DESKTOP-PU2COUJ:~$ ls output.txt
output.txt
cdac@DESKTOP-PU2COUJ:~$ cat output.txt
S
T
E
J
K
S
F
T
R
B
N
C
V
cdac@DESKTOP-PU2COUJ:~$
```

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-PU2COUJ:~$ nano duplicate.txt
cdac@DESKTOP-PU2COUJ:~$ sort duplicate.txt | uniq
Chaitali
Krutika
Mitali
Priya
Sakshi
Sonam
Sumedha
cdac@DESKTOP-PU2COUJ:~$ sort fruit.txt | uniq -c
```

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-PU2COUJ:~$ nano fruit.txt
cdac@DESKTOP-PU2COUJ:~$ sort fruit.txt | uniq -c
      1
      3 Apple
      1 Banana
      2 Cherry
      2 Grapes
      1 Mango
      1 Watermelon
cdac@DESKTOP-PU2COUJ:~$
```