Concept 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.

Solution:

```
cdac@DESKTOP-DHIPDVR:~$ ls
Feb25  abc.txt.save  myfile.txt  myfile2.txt  sh4
cdac@DESKTOP-DHIPDVR:~$ mkdir LinuxAssignment
cdac@DESKTOP-DHIPDVR:~$ ls
Feb25  LinuxAssignment  abc.txt.save  myfile.txt  myfile2.txt  sh4
cdac@DESKTOP-DHIPDVR:~$
```

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

Solution:

```
cdac@DESKTOP-DHIPDVR:~$ cd LinuxAssignment/
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat file1.txt
Hello
I
am
Student
of
CDAC
Kharghar
Mumbai
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$
```

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

Solution:

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$
```

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

Solution:

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cp file1.txt docs
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cd docs/
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ ls
file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ cat file2.txt
Hello
I
am
Student
of
CDAC
Kharghar
Mumbai
cdac@DESKTOP-DHIPDVR:~/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.

Solution:

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ ls -l
total 0
-rw-r--r-- 1 cdac cdac 43 Feb 28 19:35 file2.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ ls -l
total 0
-rwxr--r-- 1 cdac cdac 43 Feb 28 19:35 file2.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ sudo chown cdac file2.txt
[sudo] password for cdac:
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ ls -l
total 0
-rwxr--r-- 1 cdac cdac 43 Feb 28 19:35 file2.txt
cdac@DESKTOP-DHIPDVR:~/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.

Solution:

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cd ..
cdac@DESKTOP-DHIPDVR:~$ ls
Feb25  LinuxAssignment  abc.txt.save  myfile.txt  myfile2.txt  sh4
cdac@DESKTOP-DHIPDVR:~$
```

g) File Searching: a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

```
cdac@DESKTOP-DHIPDVR:~$ ls
Feb25  LinuxAssignment  abc.txt.save  myfile.txt  myfile2.txt  sh4
cdac@DESKTOP-DHIPDVR:~$ find . -type f -name "*.txt"
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
./myfile.txt
./myfile2.txt
cdac@DESKTOP-DHIPDVR:~$
```

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

```
cdac@DESKTOP-DHIPDVR:~$ cd LinuxAssignment/
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ grep "Hello" file1.txt
Hello
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$
```

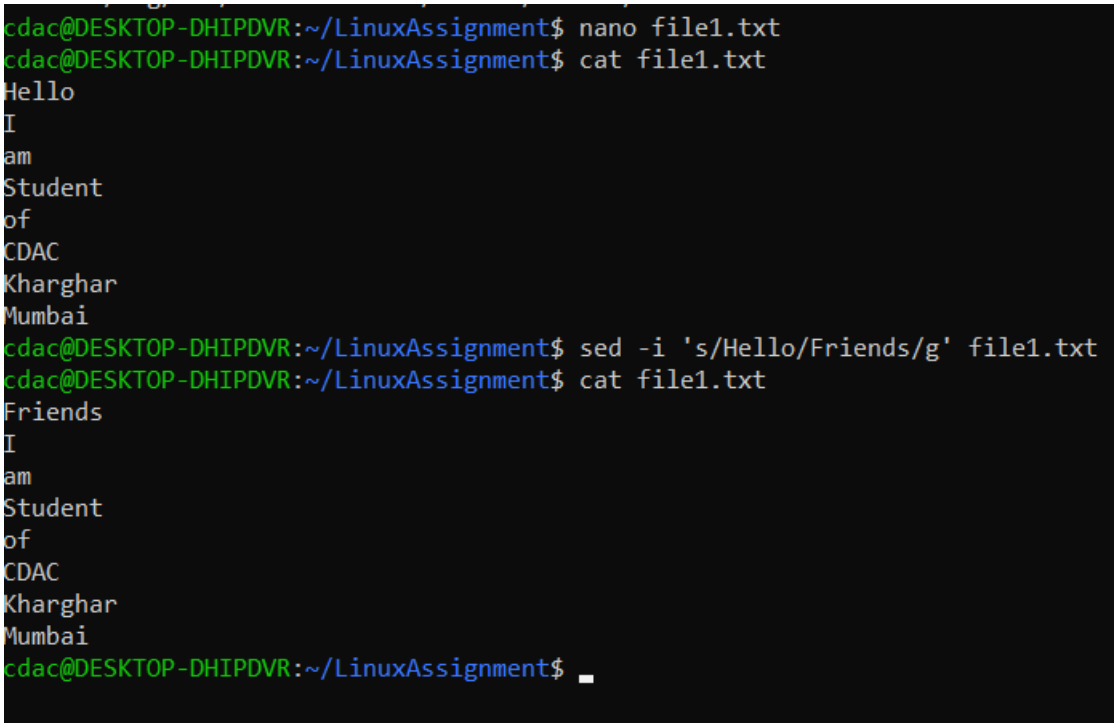
h) System Information: a. Display the current system date and time.

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ date
Fri Feb 28 20:14:43 IST 2025
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ hostname -I
192.168.1.8 2401:4900:1c9a:690c:1737:8edd:164f:d7dc 2401:4900:1c9a:690c:7c86:e53d:416e:4d
```

j) 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.



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-DHIPDVR:~/LinuxAssignment$ touch data.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ nano data.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat data.txt
Hello
Hi
Tiger
highSchool
CDAC
Operating
System
practical
news
Aajtak
report
sahara
minute
yes
no
find
some
fruits
mango
banana
tree
apple
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ head -n 10 data.txt
Hello
Hi
Tiger
highSchool
CDAC
Operating
System
practical
news
Aajtak
cdac@DESKTOP-DHIPDVR:~/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-DHIPDVR:~$ cd LinuxAssignment/
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ ls
data.txt  docs  file1.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ tail -5 data.txt
fruits
mango
banana
tree
apple
cdac@DESKTOP-DHIPDVR:~/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-DHIPDVR:~/LinuxAssignment$ touch numbers.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ ls
data.txt  docs  file1.txt  numbers.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ nano numbers.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ head -15 numbers.txt
1
2
2
3
4
5
6
7
7
8
9
10
11
12
13
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ tail -n 3 numbers.txt
13
14
15
cdac@DESKTOP-DHIPDVR:~/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-DHIPDVR:~/LinuxAssignment$ touch input.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ nano input.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat input.txt
hey
how
are
you
i
am
fine
thank
you
```

```
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat output.txt
HEY
HOW
ARE
YOU
I
AM
FINE
THANK
YOU

cdac@DESKTOP-DHIPDVR:~/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-DHIPDVR:~/LinuxAssignment$ touch duplicate.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ nano duplicate.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat duplicate.txt
Tiger
Tiger
lion
horse
elephant
cow
cow
elephant
chittah
peacock
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat duplicate.txt | sort | uniq
Tiger
chittah
cow
elephant
horse
lion
peacock
cdac@DESKTOP-DHIPDVR:~/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-DHIPDVR:~/LinuxAssignment$ touch fruit.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ nano fruit.txt
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat fruit.txt
mango
mango
banana
apple
litchi
litchi
papaya
kiwi
kiwi
grapes
grapes
orange
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$ cat fruit.txt | sort | uniq -c
      1 apple
      1 banana
      2 grapes
      2 kiwi
      2 litchi
      2 mango
      1 orange
      1 papaya
cdac@DESKTOP-DHIPDVR:~/LinuxAssignment$
```