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.

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$ mkdir LinuxAssignment
mkdir: cannot create directory 'LinuxAssignment': File exists
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$ touch LinuxAssignment
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$ ls
 app4                 Documents                              Music      Templates
'Bitlocker recovery'  Downloads                              Pictures   Videos
 demo.txt             google-chrome-stable_current_amd64.deb  Public
 Desktop              LinuxAssignment                        SDM
 djd                  MUMBAI                                 snap
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$
```

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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat > file.txt
this is my file "NIkhil"

nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat file.txt
this is my file "NIkhil"

nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$
```

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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ mkdir docs
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ ls
docs   file.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$
```

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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cp file1.txt file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ mv file2.txt docs
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ ls
docs  file1.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cd docs
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ ls
file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ ls -l file2.txt
-rw-rw-r-- 1 nikhil nikhil 25 Feb 27 22:59 file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ chmod og-rwx file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ chmod nikhil file2.txt
chmod: invalid mode: 'nikhil'
Try 'chmod --help' for more information.
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ chown nikhil file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ ls -l file2.txt
-rw------- 1 nikhil nikhil 25 Feb 27 22:59 file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ ls
file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment/docs$ cd ..
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ ls
docs  file1.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$  cd..
cd..: command not found
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cd ..
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$ ls
app4                  Downloads                                Music      snap
'Bitlocker recovery'  google-chrome-stable_current_amd64.deb   Pictures   Templates
 Desktop              LinuxAssignment                          Public     Videos
 Documents            MUMBAI                                   SDM
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$ 
```

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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~$ cd LinuxAssignment
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt
./docs/file2.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ 
```

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

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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ date
Thursday 27 February 2025 11:20:24 PM IST
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ 
```

i) Networking:
   a. Display the IP address of the system.
   b. Ping a remote server to check connectivity (provide a remote server address to ping). j) File Compression:
   a. Compress the "docs" directory into a zip file.
   b. Extract the contents of the zip file into a new directory.

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).

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ ls
docs  duplicate.txt  file1.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ nano file1.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat file1.txt
this is my file "Nikhil" abc
this is my file "Nikhil" xyz

nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ sed -i 's/abc/xyz/g' file1.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat file1.txt
this is my file "Nikhil" xyz
this is my file "Nikhil" xyz

nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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.

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ head -10 data.txt
A
B
C
D
E
F
G
H
I
J
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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.

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ tail -5 data.txt
H
I
J
K
M
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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.

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ head -15 numbers.txt
11
22
33
44
55
66
77
88
99
00
111
222
333
444
555
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ 
```

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

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ tail -3 numbers.txt
555
666
777
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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."

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat > input.txt
cdac mumbai
CDAC MUMBAI
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ tr [:lower] [:upper] < input.txt
cdac mumbai
CDAC MUMBAI
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ tr [:lower] [:upper] < input.txt > output.
xt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat output.txt
cdac mumbai
CDAC MUMBAI
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ tr [:lower:] [:upper:] < input.txt > outpu
.txt
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat output.txt
CDAC MUMBAI
CDAC MUMBAI
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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."

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat duplicate.txt
apple
banana
cherry
pear
mango
orange
pear
cherry
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat duplicate.txt | sort |uniq
apple
banana
cherry
mango
orange
pear
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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."

```
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat > fruit.txt
banana
apple
banana
cherry
apple
kiwi
cherry
pear
mango
kiwi
orange
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/LinuxAssignment$ cat fruit.txt | sort | uniq
apple
banana
cherry
kiwi
mango
orange
pear
nikhil@nikhil-IdeaPad-Gaming-3-15IAH7:~/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.