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.

f) **Final Checklist:**
   a. Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

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).

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

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).

```
cdac@Kaustubh: ~/LinuxAssignment
cdac@Kaustubh:~$ ls
cdac@Kaustubh:~$ mkdir LinuxAssignment
cdac@Kaustubh:~$ cd
cdac@Kaustubh:~$ cd LinuxAssignment/
cdac@Kaustubh:~/LinuxAssignment$ touch file1.txt
cdac@Kaustubh:~/LinuxAssignment$ nano file1.txt
cdac@Kaustubh:~/LinuxAssignment$ cat file1.txt
This is Linux Assignment 1
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ mkdir docs
cdac@Kaustubh:~/LinuxAssignment$ touch file2.txt
cdac@Kaustubh:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@Kaustubh:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 18:41 docs
-rw-r--r-- 1 cdac cdac   27 Feb 27 18:37 file1.txt
-rw-r--r-- 1 cdac cdac    0 Feb 27 18:40 file2.txt
cdac@Kaustubh:~/LinuxAssignment$ chmod 744 docs/file2.txt
cdac@Kaustubh:~/LinuxAssignment$ chown $USER docs/file2.txt
cdac@Kaustubh:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 18:41 docs
-rw-r--r-- 1 cdac cdac   27 Feb 27 18:37 file1.txt
-rw-r--r-- 1 cdac cdac    0 Feb 27 18:40 file2.txt
cdac@Kaustubh:~/LinuxAssignment$ chmod 744 file2.txt
cdac@Kaustubh:~/LinuxAssignment$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 18:41 docs
-rw-r--r-- 1 cdac cdac   27 Feb 27 18:37 file1.txt
-rwxr--r-- 1 cdac cdac    0 Feb 27 18:40 file2.txt
cdac@Kaustubh:~/LinuxAssignment$ chown $USER file2.txt
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ find . -name ".txt"
cdac@Kaustubh:~/LinuxAssignment$ grep "Linux" file1.txt
This is Linux Assignment 1
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ date
Thu Feb 27 18:44:57 IST 2025
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
```

```
cdac@Kaustubh: ~/LinuxAssignment
       valid_lft forever preferred_lft forever
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:28:65:a2 brd ff:ff:ff:ff:ff:ff
    inet 172.26.169.30/20 brd 172.26.175.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe28:65a2/64 scope link
       valid_lft forever preferred_lft forever
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ ping -c 4 microsoft.com
PING microsoft.com (20.112.250.133) 56(84) bytes of data.
64 bytes from 20.112.250.133 (20.112.250.133): icmp_seq=1 ttl=101 time=209 ms
64 bytes from 20.112.250.133 (20.112.250.133): icmp_seq=2 ttl=101 time=209 ms
64 bytes from 20.112.250.133 (20.112.250.133): icmp_seq=3 ttl=101 time=208 ms
64 bytes from 20.112.250.133 (20.112.250.133): icmp_seq=4 ttl=101 time=222 ms

--- microsoft.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3147ms
rtt min/avg/max/mdev = 208.063/211.974/222.062/5.838 ms
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ unzip docs.zip -d extracted_docs
Archive:  docs.zip
   creating: extracted_docs/docs/
 extracting: extracted_docs/docs/file2.txt
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ nano file1.txt
cdac@Kaustubh:~/LinuxAssignment$ cat file1.txt
This is Linux Assignment 1
cdac@Kaustubh:~/LinuxAssignment$ sed -i 's/This is Linux Assignment 1/Linux Assignment 1 Completed Succesfully/g' file1.txt
cdac@Kaustubh:~/LinuxAssignment$ cat file1.txt
Linux Assignment 1 Completed Succesfully
cdac@Kaustubh:~/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.

b. Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.

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.

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

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."

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."

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."

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.

```
Select cdac@Kaustubh: ~/LinuxAssignment

cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ touch input.txt
cdac@Kaustubh:~/LinuxAssignment$ nano input.txt
cdac@Kaustubh:~/LinuxAssignment$ cat input.txt
this is linux assignment
cdac@Kaustubh:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt >output.txt
cdac@Kaustubh:~/LinuxAssignment$ cat output.txt
THIS IS LINUX ASSIGNMENT
cdac@Kaustubh:~/LinuxAssignment$ nano duplicate.txt
cdac@Kaustubh:~/LinuxAssignment$ cat duplicate.txt
India
Pakistan
Afganistan
Canada
India
Canada
cdac@Kaustubh:~/LinuxAssignment$ sort duplicate.txt
Afganistan
Canada
Canada
India
India
Pakistan
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ nano fruit.txt
cdac@Kaustubh:~/LinuxAssignment$ cat fruit.txt
Mango
Apple
Grapes
Banana
Watermelon
Kiwi
Mango
Grapes
Kiwi
cdac@Kaustubh:~/LinuxAssignment$ sort fruit.txt | uniq
Apple
Banana
Grapes
Kiwi
Mango
Watermelon
cdac@Kaustubh:~/LinuxAssignment$
```


```
Select cdac@Kaustubh: ~/LinuxAssignment

cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ touch input.txt
cdac@Kaustubh:~/LinuxAssignment$ nano input.txt
cdac@Kaustubh:~/LinuxAssignment$ cat input.txt
this is linux assignment
cdac@Kaustubh:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt >output.txt
cdac@Kaustubh:~/LinuxAssignment$ cat output.txt
THIS IS LINUX ASSIGNMENT
cdac@Kaustubh:~/LinuxAssignment$ nano duplicate.txt
cdac@Kaustubh:~/LinuxAssignment$ cat duplicate.txt
India
Pakistan
Afganistan
Canada
India
Canada
cdac@Kaustubh:~/LinuxAssignment$ sort duplicate.txt
Afganistan
Canada
Canada
India
India
Pakistan
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$
cdac@Kaustubh:~/LinuxAssignment$ nano fruit.txt
cdac@Kaustubh:~/LinuxAssignment$ cat fruit.txt
Mango
Apple
Grapes
Banana
Watermelon
Kiwi
Mango
Grapes
Kiwi
cdac@Kaustubh:~/LinuxAssignment$ sort fruit.txt | uniq
Apple
Banana
Grapes
Kiwi
Mango
Watermelon
cdac@Kaustubh:~/LinuxAssignment$
```