CDAC MUMBAI

Concepts of Operating System

Assignment 1

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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-4G80EEJ:~$ pwd
/home/cdac
cdac@DESKTOP-4G80EEJ:~$ mkdir LinuxAssignment
cdac@DESKTOP-4G80EEJ:~$ ls
LinuxAssignment
cdac@DESKTOP-4G80EEJ:~$ cd LinuxAssignment
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$
```

b) **File Management:**

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cat file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ echo "This is a text inside file1." > file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cat file1.txt
This is a text inside file1.
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$
```

c) Directory Management:

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$
```

d) Copy and Move Files:

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cd docs
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-4G80EEJ:~/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.

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r--r-- 1 cdac cdac 29 Aug 28 18:14 file2.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ chmod u+rwx file2.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 29 Aug 28 18:14 file2.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ chmod o+r file2.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 29 Aug 28 18:14 file2.txt
```

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ chown cdac file2.txt
```

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/docs$ ls
file2.txt
```

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-4G80EEJ:~/LinuxAssignment/docs$ cd ..
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ ls
docs  file1.txt
```

```
cdac@DESKTOP-4G80EEJ:~$ ls
LinuxAssignment
```

g) File Searching:

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

```
cdac@DESKTOP-4G80EEJ:~$ find . -type f -name "*.txt"
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file2.txt
```

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

```
cdac@DESKTOP-4G80EEJ:~$ grep "inside file1" LinuxAssignment/file1.txt
This is a text inside file1.
```

h) System Information:

a. Display the current system date and time.

```
cdac@DESKTOP-4G80EEJ:~$ date
Wed Aug 28 18:50:01 IST 2024
```

i) Networking:

a. Display the IP address of the system.

```
cdac@DESKTOP-4G80EEJ:~$ hostname -I
172.24.118.248
```

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

```
cdac@DESKTOP-4G80EEJ:~$ ping www.google.com
PING www.google.com (142.250.193.228) 56(84) bytes of data.
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=1 ttl=117 time=5.86 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=2 ttl=117 time=5.41 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=3 ttl=117 time=5.19 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=4 ttl=117 time=6.71 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=5 ttl=117 time=4.73 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=6 ttl=117 time=6.36 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=7 ttl=117 time=26.6 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=8 ttl=117 time=5.03 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=9 ttl=117 time=5.02 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=10 ttl=117 time=4.46 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=11 ttl=117 time=5.20 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=12 ttl=117 time=5.49 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=13 ttl=117 time=4.41 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=14 ttl=117 time=4.60 ms
64 bytes from del11s18-in-f4.1e100.net (142.250.193.228): icmp_seq=15 ttl=117 time=6.19 ms
^C
--- www.google.com ping statistics ---
15 packets transmitted, 15 received, 0% packet loss, time 14013ms
rtt min/avg/max/mdev = 4.414/6.751/26.629/5.354 ms
```

j) File Compression:

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ zip -r docs.zip docs/
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
```

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ mkdir newdirectory
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  newdirectory
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ unzip docs.zip -d newdirectory
Archive:  docs.zip
   creating: newdirectory/docs/
 extracting: newdirectory/docs/file2.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cd newdirectory
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment/newdirectory$ ls
docs
```

k) File Editing:

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cat file1.txt
This is a text inside file1.
This is the first assignment given by cdac
```

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-4G80EEJ:~/LinuxAssignment$ sed -i 's/cdac/adityasir/g' file1.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cat file1.txt
This is a text inside file1.
This is the first assignment given by adityasir
```

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-4G80EEJ:~/LinuxAssignment$ touch data.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ nano data.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ head -10 data.txt
information1
information2
information3
information4
information5
information6
information7
information8
information9
information10
```

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-4G80EEJ:~/LinuxAssignment$ tail -5 data.txt
information9
information10
information11
information12
information13
```

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-4G80EEJ:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

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

```
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
```

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-4G80EEJ:~/LinuxAssignment$ touch input.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ nano input.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ tr '[:lower:]' '[:upper:]' < input.txt > output.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cat output.txt
THIS IS INSIDE INPUT TEXT FILE.
```

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-4G80EEJ:~/LinuxAssignment$ touch duplicate.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ nano duplicate.txt
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ cat duplicate.txt
this is inside duplicate document
this is inside duplicate document
this is inside unique document
this is inside duplicate document
cdac@DESKTOP-4G80EEJ:~/LinuxAssignment$ sort duplicate.txt | uniq
this is inside duplicate document
this is inside unique document
```

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."