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@Ashwindg54:~$ pwd

/home/cdac

cdac@Ashwindg54:~$ cd

cdac@Ashwindg54:~$ ls

Feb25 sum.sh

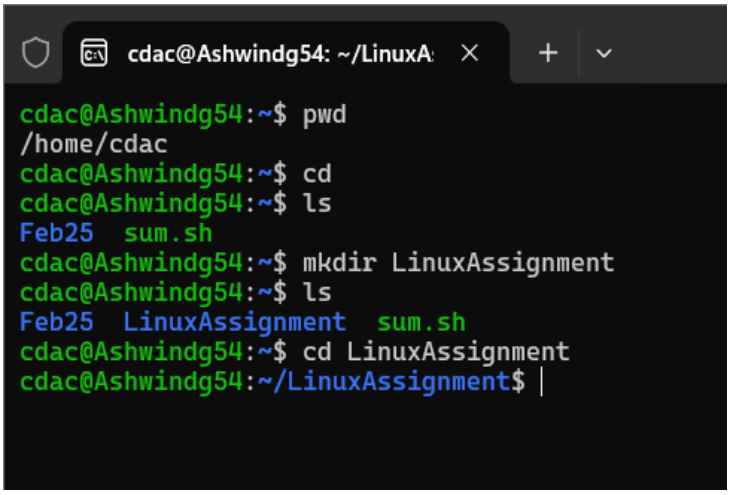
cdac@Ashwindg54:~$ mkdir LinuxAssignment

cdac@Ashwindg54:~$ ls

Feb25 LinuxAssignment sum.sh

cdac@Ashwindg54:~$ cd LinuxAssignment

cdac@Ashwindg54:~/LinuxAssignment$

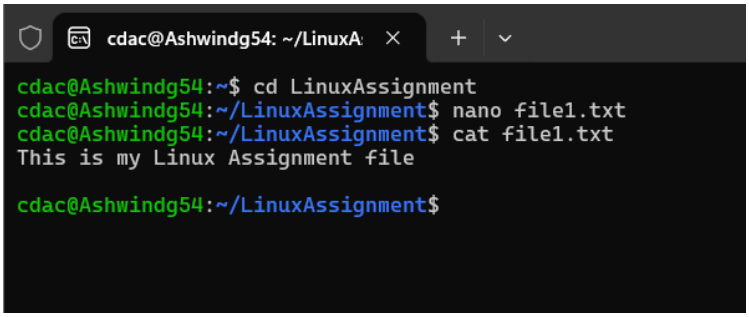


b) File Management: a. Inside the "LinuxAssignment" directory, create a new file named "file1.txt". Display its contents.

1: Navigate to the "LinuxAssignment" Directory -**cd**

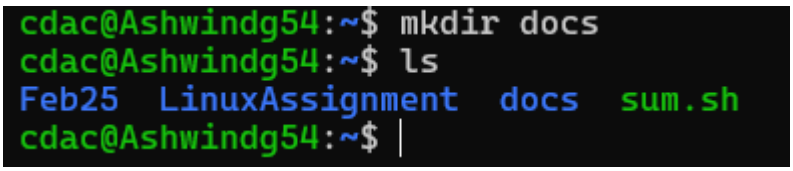
2: Create a New File Named file1.txt-**nano file1.txt**

4:Display the Contents of file1.txt-**cat file1.txt**



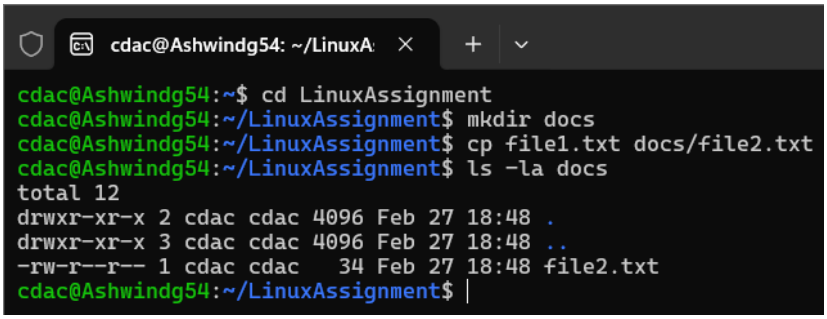
c) Directory Management: a. Create a new directory named "docs" inside the "LinuxAssignment" directory.

Create the "docs" Directory-**mkdir docs**



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

1: Copy and Rename the File- **cp file1.txt docs/file2.txt**

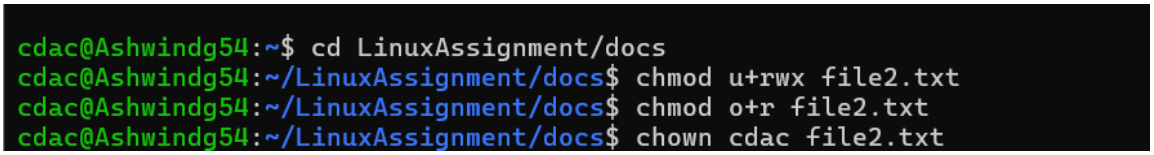


e) Permissions and Ownership: a. Change the permissions of "file2.txt" to allow read, write, and execute permissions for the owner and only read permissions for others. Then, change the owner of "file2.txt" to the current user.

1. Use chmod u+wrx command to allocate read, write, and execute permissions to the current user.

2. Use chmod u+r command to allocate read permissions to other users.

3. Use chown command to assign the ownership of file2.txt to the 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.

1. Use cd command to go to home directory.

2. Then use ls command to list the contents of home directory.

3. Change the directory to LinuxAssignment with the help of cd command.

4. List the contents of LinuxAssignment directory by again using the cd command.

5. Change the directory to docs with the help of cd command.

6. List the contents of docs directory by again using the cd command.

```
cdac@Ashwindg54:~$ cd LinuxAssignment
cdac@Ashwindg54:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ cd docs
cdac@Ashwindg54:~/LinuxAssignment/docs$ ls
file2.txt
cdac@Ashwindg54:~/LinuxAssignment/docs$
```

g) File Searching:

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

1. Use cd command to change the directory to home directory

2. Use command find . -type f -name "*.txt" to search the for all files with the extension ".txt" in the current directory and its subdirectories.

```
cdac@Ashwindg54:~$ cd
cdac@Ashwindg54:~$ find . -type f -name "*.txt"
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
./Feb25/abc.txt
./Feb25/xyz.txt
```

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

1. Use cd command to change the directory to directory containing target text file.

2. In order to get some output, add some text in the file using nano editor.

3. Use command grep -i “Hello” file1.txt to display lines containing a specific word (Linux & is) in a file (file1.txt).

```
cdac@Ashwindg54:~/LinuxAssignment$ grep -i "Linux" file1.txt
This is my Linux Assignment file
cdac@Ashwindg54:~/LinuxAssignment$ grep "is" file1.txt
This is my Linux Assignment file
```

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

1. Use date command to display the current system date and me.

```
cdac@Ashwindg54:~$ date
Thu Feb 27 21:35:56 IST 2025
cdac@Ashwindg54:~$
```

i) Networking:

1. Use hostname -I command to display the current system date and me.

2. Use ping command to Ping a remote server (google.com) to check connec vity. Use

```
cdac@Ashwindg54:~$ hostname -I
192.168.70.212
cdac@Ashwindg54:~$ ping -c 10 www.google.com
PING www.google.com (142.250.183.100) 56(84) bytes of data.
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=1 ttl=115
 time=6.15 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=2 ttl=115
 time=5.09 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=3 ttl=115
 time=5.71 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=4 ttl=115
 time=9.47 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=5 ttl=115
 time=5.85 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=6 ttl=115
 time=7.82 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=7 ttl=115
 time=8.91 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=8 ttl=115
 time=5.56 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=9 ttl=115
 time=7.83 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=10 ttl=11
5 time=5.79 ms

--- www.google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9016ms
rtt min/avg/max/mdev = 5.089/6.817/9.465/1.470 ms
cdac@Ashwindg54:~$
```

j) File Compression:

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

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

1. Use tar -cvzf “Docs.gz” docs/ command to compress the docs directory into file “Docs.gz”.

2. Use ls command to the display the contents of current directory.

3. Use mkdir new command to create a directory with name “new”.

4. Then, use command tar -xzf “Docs.zip” -C new/ to extract the contents of Docs.zip into new/ directory.

5. Finally use ls command to see the results.

```
cdac@Ashwindg54:~$ cd LinuxAssignment
cdac@Ashwindg54:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ tar -cvzf "Docs.gz" docs/
docs/
docs/file2.txt
cdac@Ashwindg54:~/LinuxAssignment$ ls
Docs.gz  docs  file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ mkdir compressdemo
cdac@Ashwindg54:~/LinuxAssignment$ ls
Docs.gz  compressdemo  docs  file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ tar -cvzf "Docs.gz" -C compressdemo/
tar: Cowardly refusing to create an empty archive
Try 'tar --help' or 'tar --usage' for more information.
cdac@Ashwindg54:~/LinuxAssignment$ tar -xzf "Docs.gz" -C compressdemo/
cdac@Ashwindg54:~/LinuxAssignment$ ls
Docs.gz  compressdemo  docs  file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ cd compressdemo
cdac@Ashwindg54:~/LinuxAssignment/compressdemo$ ls
docs
cdac@Ashwindg54:~/LinuxAssignment/compressdemo$
```

k) File Editing:

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

1. Open the directory containing target file using cd command,

2. Use nano target_file.txt command to open nano editor to add few contents in it.

```
cdac@Ashwindg54:~/LinuxAssignment/compressdemo$ cd
cdac@Ashwindg54:~$ cd LinuxAssignment
cdac@Ashwindg54:~/LinuxAssignment$ ls
Docs.gz  compressdemo  docs  file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ nano file1.txt
cdac@Ashwindg54:~/LinuxAssignment$
```

```
  GNU nano 4.8                    file1.txt
This is my Linux Assignment file
Hii am name is Ashwin
I am a Sports Person
hii
Good morning
```

b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

1. Use the command sed -i "s/Hello/Hi /g" file1.txt to subs tute the word Hello with Hi in target file (file1.txt).

2. -i indicates the shell to ignore case dis nc on, s represents the subs tu on and g indicates the shell to replace all occurrences in each line.

```
cdac@Ashwindg54:~/LinuxAssignment$ sed -i "s/Hello/Hi/g" file1.txt
cdac@Ashwindg54:~/LinuxAssignment$ cat file1.txt
This is my Linux Assignment file
Hii am name is Ashwin
I am a Sports Person
hii
Good morning
```

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.

1. Use nano command to create a file called data.txt containing several lines in it.
2. Use head data.txt command to display first 10 lines of file “data.txt”

```
cdac@Ashwindg54:~/LinuxAssignment$ nano data.txt
cdac@Ashwindg54:~/LinuxAssignment$ head data.txt
1
2
3
4
5
6
7
8
9
10
cdac@Ashwindg54:~/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.

1. Use tail data.txt command to display last 10 lines of file “data.txt”

```
cdac@Ashwindg54:~/LinuxAssignment$ tail -5 data.txt
6
7
8
9
10
cdac@Ashwindg54:~/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.

1. Use nano command to create a file called numbers.txt containing several number lines in it.
2. Use head -15 numbers.txt command to display first 15 lines of file “data.txt”

```
cdac@Ashwindg54:~/LinuxAssignment$ nano numbers.txt
cdac@Ashwindg54:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@Ashwindg54:~/LinuxAssignment$
```

d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".
1. Use head -3 numbers.txt command to display first 3 lines of file “number.txt”

```
cdac@Ashwindg54:~/LinuxAssignment$ tail -3 numbers.txt
14
15
16
cdac@Ashwindg54:~/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."

1. Use nano command to create a file named input.txt and put some textual content in it.

2. Use tr ‘a-z’ ‘A-Z’ output.txt command to convert the content of input.txt to upper case and store it in new file (output.txt).

```
cdac@Ashwindg54:~/LinuxAssignment$ nano input.txt
cdac@Ashwindg54:~/LinuxAssignment$ cat input.txt
hii my name is Ashwin Ghute i am a full Stack Java Developer.
cdac@Ashwindg54:~/LinuxAssignment$ cat output.txt
cat: output.txt: No such file or directory
cdac@Ashwindg54:~/LinuxAssignment$ tr 'a-z' 'A-Z' <input.txt> output.txt
cdac@Ashwindg54:~/LinuxAssignment$ cat input.txt
hii my name is Ashwin Ghute i am a full Stack Java Developer.
cdac@Ashwindg54:~/LinuxAssignment$ cat output.txt
HII MY NAME IS ASHWIN GHUTE I AM A FULL STACK JAVA DEVELOPER.
cdac@Ashwindg54:~/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."

1. Use nano command to create a file named duplicate.txt and put some repe ve textual content in it.

2. Use sort duplicate.txt command to sort the contents of duplicate.txt file and use uniq command in conjuga on with it to get the result as distinct lines of content. uniq only removes consecutive duplicate lines.

```
cdac@Ashwindg54:~/LinuxAssignment$ nano duplicate.txt
cdac@Ashwindg54:~/LinuxAssignment$ cat duplicate.txt
Tomato
potato
cabbage
carrot
onion
mushroom
pumpkin
broccoli
green peas
brinjal
cdac@Ashwindg54:~/LinuxAssignment$ sort duplicate.txt | uniq
Tomato
brinjal
broccoli
cabbage
carrot
green peas
mushroom
onion
potato
pumpkin
cdac@Ashwindg54:~/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."

1. Create a file named fruit.txt using nano command and put some fruit names repe vely in it.
2. Use the command sort fruit.txt | uniq -c to display the name of all fruits dis nctly along with their frequency of occurrence. -c counts and displays the occurrences of each unique line.