

Concepts of Operating System

Assignment 1

Problem 1 Solution :

1. Navigate and List:

- 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-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:/home$ pwd
/home
cdac@DESKTOP-9A0KG4Q:/home$ ls
cdac  sahil  suyog
cdac@DESKTOP-9A0KG4Q:/home$ cd cdac/
cdac@DESKTOP-9A0KG4Q:~$ ls
directory1 directory2 directory3 praccmd
cdac@DESKTOP-9A0KG4Q:~$ mkdir LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~$ ls
LinuxAssignment directory1 directory2 directory3 praccmd
cdac@DESKTOP-9A0KG4Q:~$ cd LinuxAssignment/
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

2. File Management:

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

```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cd ..
cdac@DESKTOP-9A0KG4Q:~$ pwd
/home/cdac
cdac@DESKTOP-9A0KG4Q:~$ ls
LinuxAssignment directory1 directory2 directory3 praccmd
cdac@DESKTOP-9A0KG4Q:~$ cd LinuxAssignment/
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ nano file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat file1.txt
This is file1
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

3. Directory Management:

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

```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~$ pwd
/home/cdac
cdac@DESKTOP-9A0KG4Q:~$ cd LinuxAssignment/
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

4. Copy and Move Files:

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

```
Select cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment/docs
cdac@DESKTOP-9A0KG4Q:~$ pwd
/home/cdac
cdac@DESKTOP-9A0KG4Q:~$ cd LinuxAssignment/
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
docs  file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cd docs/
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$
```

5. Permissions and Ownership:

- 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-9A0KG4Q: ~/LinuxAssignment/docs
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r--r-x 1 cdac cdac 14 Aug 29 07:09 file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ chmod u+x file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-x 1 cdac cdac 14 Aug 29 07:09 file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ chmod o-x file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 14 Aug 29 07:09 file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ whoami
cdac
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ sudo adduser currentuser
[sudo] password for cdac:
Adding user 'currentuser' ...
Adding new group 'currentuser' (1003) ...
Adding new user 'currentuser' (1003) with group 'currentuser' ...
Creating home directory '/home/currentuser' ...
Copying files from '/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for currentuser
Enter the new value, or press ENTER for the default
    Full Name []: Sahil
    Room Number []: 303
    Work Phone []: 898989
    Home Phone []: 444444
    Other []: 6789
Is the information correct? [Y/n] y
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ sudo chown currentuser file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ sudo ls
file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ ls -l
ls: cannot access '.': No such file or directory
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 currentuser cdac 14 Aug 29 07:09 file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/docs$
```

6. Final Checklist:

- Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

```
cdac@DESKTOP-9A0KG4Q: ~  
cdac@DESKTOP-9A0KG4Q:~$ pwd  
/home/cdac  
cdac@DESKTOP-9A0KG4Q:~$ ls /home/cdac/LinuxAssignment  
docs file1.txt  
cdac@DESKTOP-9A0KG4Q:~$ ls /  
bin boot dev etc home init lib lib32 lib64 libx32 lost+found media mnt opt proc root run sbin snap srv sys tmp usr var  
cdac@DESKTOP-9A0KG4Q:~$
```

7. File Searching:

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

```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment  
cdac@DESKTOP-9A0KG4Q:~$ cd LinuxAssignment/  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ find . -name "*.txt"  
./docs/file2.txt  
./file1.txt  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls  
docs file1.txt  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ grep "This" file1.txt  
This is file1  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

8. System Information:

- Display the current system date and time.

```
cdac@DESKTOP-9A0KG4Q: ~  
cdac@DESKTOP-9A0KG4Q:~$ date  
Thu Aug 29 07:42:52 PDT 2024  
cdac@DESKTOP-9A0KG4Q:~$ time  
real    0m0.000s  
user    0m0.000s  
sys     0m0.000s  
cdac@DESKTOP-9A0KG4Q:~$
```

9. Networking:

- Display the IP address of the system.

```
cdac@DESKTOP-9A0KG4Q: ~  
cdac@DESKTOP-9A0KG4Q:~$ hostname -I  
172.24.135.186  
cdac@DESKTOP-9A0KG4Q:~$
```

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

```
cdac@DESKTOP-9A0KG4Q:~  
cdac@DESKTOP-9A0KG4Q:~$ ping google.com  
PING google.com (142.250.70.110) 56(84) bytes of data.  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=1 ttl=117 time=6.03 ms  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=2 ttl=117 time=8.53 ms  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=3 ttl=117 time=5.80 ms  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=4 ttl=117 time=7.66 ms  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=5 ttl=117 time=7.03 ms  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=6 ttl=117 time=6.08 ms  
64 bytes from pnbomb-ac-in-f14.1e100.net (142.250.70.110): icmp_seq=7 ttl=117 time=5.83 ms  
^C  
--- google.com ping statistics ---  
7 packets transmitted, 7 received, 0% packet loss, time 6010ms  
rtt min/avg/max/mdev = 5.795/6.708/8.532/0.985 ms  
cdac@DESKTOP-9A0KG4Q:~$
```

10. File Compression:

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

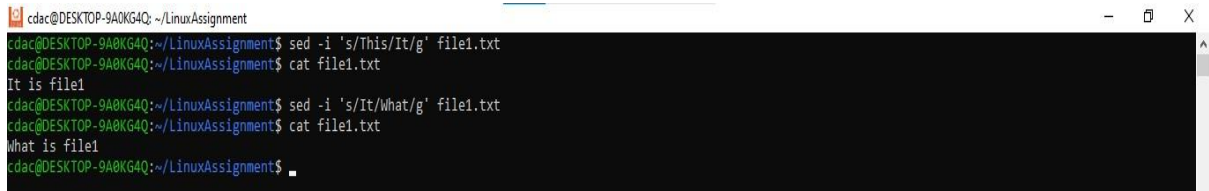
```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cd LinuxAssignment/  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls  
docs  file1.txt  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ zip myfile.zip docs  
  adding: docs/ (stored 0%)  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls  
docs  file1.txt  myfile.zip  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment/newdirectory  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls  
docs  file1.txt  myfile.zip  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ mkdir newdirectory  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls  
docs  file1.txt  myfile.zip  newdirectory  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ unzip myfile.zip -d newdirectory  
Archive:  myfile.zip  
  creating: newdirectory/docs/  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls  
docs  file1.txt  myfile.zip  newdirectory  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cd newdirectory  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/newdirectory$ ls  
docs  
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment/newdirectory$
```

11. File Editing:

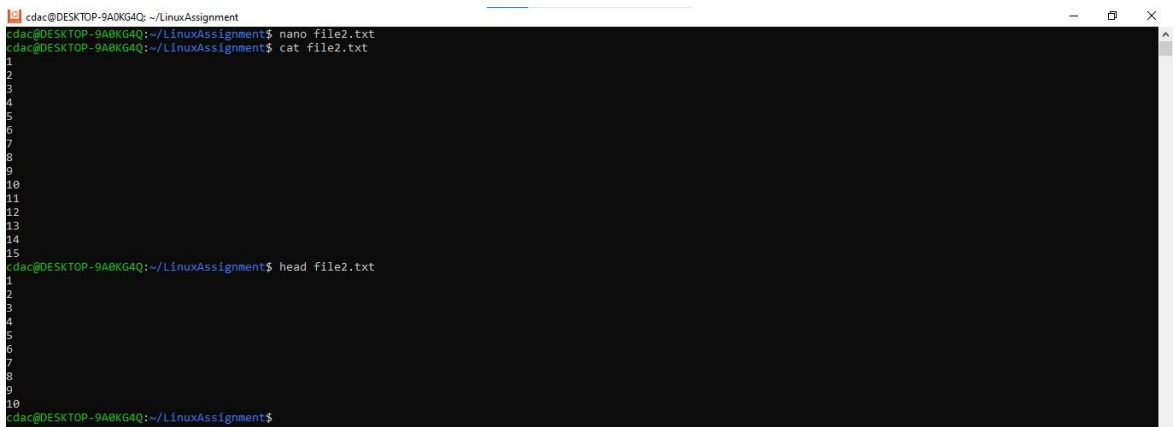
- Open the "file1.txt" file in a text editor and add some text to it.
- Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).



```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ sed -i 's/This/It/g' file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat file1.txt
It is file1
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ sed -i 's/It/What/g' file1.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat file1.txt
What is file1
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

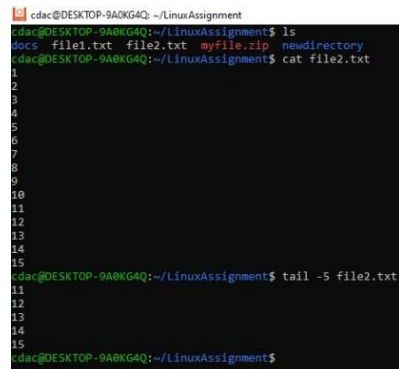
Problem 2 Solution :

- 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.



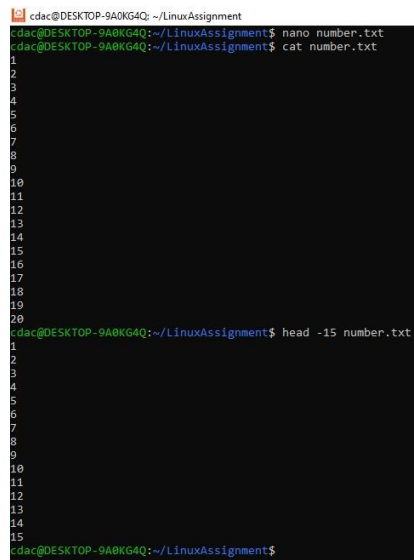
```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ nano file2.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat file2.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ head file2.txt
1
2
3
4
5
6
7
8
9
10
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

- 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-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
docs  file1.txt  file2.txt  myfile.zip  newdirectory
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat file2.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ tail -5 file2.txt
11
12
13
14
15
cdac@DESKTOP-9A0KG4Q:~/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-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ nano number.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ head -15 number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```

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

```
cdac@DESKTOP-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
docs  file1.txt  file2.txt  myfile.zip  newdirectory  number.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ tail -3 number.txt
18
19
20
cdac@DESKTOP-9A0KG4Q:~/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-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ nano input.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat input.txt
india is my country
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ ls
docs  file1.txt  file2.txt  input.txt  myfile.zip  newdirectory  number.txt  output.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat output.txt
INDIA IS MY COUNTRY
cdac@DESKTOP-9A0KG4Q:~/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-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ nano duplicate.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat duplicate.txt
1
1
2
3
3
4
5
6
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ uniq -u duplicate.txt
2
4
6
cdac@DESKTOP-9A0KG4Q:~/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-9A0KG4Q: ~/LinuxAssignment
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ nano fruit.txt
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ cat fruit.txt
apple
banana
apple
jacfruit
apple
watermelon
pineapple
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$ sort fruit.txt |uniq --count
  2 apple
  1 apple
  1 banana
  1 jacfruit
  1 pineapple
  1 watermelon
cdac@DESKTOP-9A0KG4Q:~/LinuxAssignment$
```