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:

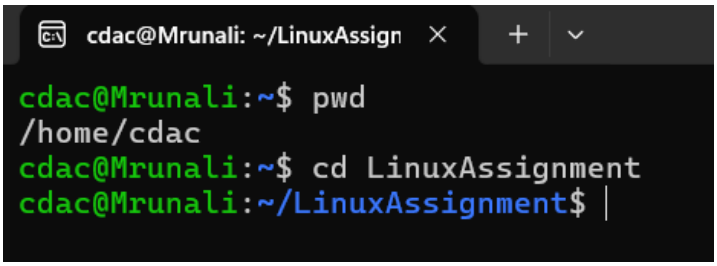
a. Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.

cdac@Mrunali:~$ pwd

/home/cdac

cdac@Mrunali:~$ cd LinuxAssignment

cdac@Mrunali:~/LinuxAssignment$



b) File Management:

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

cdac@Mrunali:~/LinuxAssignment$ touch file1.txt

cdac@Mrunali:~/LinuxAssignment$ ls

file1.txt

cdac@Mrunali:~/LinuxAssignment$ echo "This is ASSIGNMENT 1 of Operating System Module." >file1.txt

cdac@Mrunali:~/LinuxAssignment$ cat file1.txt

This is ASSIGNMENT 1 of Operating System Module.

cdac@Mrunali:~/LinuxAssignment$ ^C

cdac@Mrunali:~/LinuxAssignment$

```
cdac@Mrunali: ~/LinuxAssign
cdac@Mrunali:~$ pwd
/home/cdac
cdac@Mrunali:~$ cd LinuxAssignment
cdac@Mrunali:~/LinuxAssignment$ touch file1.txt
cdac@Mrunali:~/LinuxAssignment$ ls
file1.txt
cdac@Mrunali:~/LinuxAssignment$ echo "This is ASSIGNMENT 1 of Operating System Module." >file1.txt
cdac@Mrunali:~/LinuxAssignment$ cat file1.txt
This is ASSIGNMENT 1 of Operating System Module.
cdac@Mrunali:~/LinuxAssignment$
```

c) Directory Management:

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

```
cdac@Mrunali:~/LinuxAssignment$ ^C
cdac@Mrunali:~/LinuxAssignment$ mkdir docs
cdac@Mrunali:~/LinuxAssignment$
```

d) Copy and Move Files:

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

```
cdac@Mrunali:~/LinuxAssignment$ ^C
cdac@Mrunali:~/LinuxAssignment$ mkdir docs
cdac@Mrunali:~/LinuxAssignment$ cp file1.txt /home/cdac/LinuxAssignment/docs
cdac@Mrunali:~/LinuxAssignment$ cd docs
cdac@Mrunali:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@Mrunali:~/LinuxAssignment/docs$ ls
file2.txt
cdac@Mrunali:~/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@Mrunali:~/LinuxAssignment/docs$
cdac@Mrunali:~/LinuxAssignment/docs$ chmod u + rwx file2.txt
chmod: invalid mode: ‘u’
Try 'chmod --help' for more information.
cdac@Mrunali:~/LinuxAssignment/docs$ chmod u+rwx file2.txt
cdac@Mrunali:~/LinuxAssignment/docs$ chmod o+r file2.txt
cdac@Mrunali:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 49 Feb 26 19:56 file2.txt
cdac@Mrunali:~/LinuxAssignment/docs$ chown $(whoami) file2.txt
cdac@Mrunali:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 49 Feb 26 19:56 file2.txt
cdac@Mrunali:~/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.

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

g) File Searching:

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

```
cdac@Mrunali:~/LinuxAssignment$ which find
/usr/bin/find
cdac@Mrunali:~/LinuxAssignment$ find . -type f -name "*.txt"
./docs/file2.txt
./file1.txt
cdac@Mrunali:~/LinuxAssignment$
```

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

```
cdac@Mrunali:~/LinuxAssignment$ echo -e "Hello everyone, Mrunali Kale here.\n\nToday was my first day of Operating System, and we learned about:\n\n1. What is OS?\n2. OS Features\n3. Multiprogramming\n4. Multiprocessing\n5. Multitasking\n6. Basic commands\n7. Working with the file system\n8. Process lifecycle\n" > file.txt
cdac@Mrunali:~/LinuxAssignment$ cat file.txt
Hello everyone, Mrunali Kale here.

Today was my first day of Operating System, and we learned about:

1. What is OS?
2. OS Features
3. Multiprogramming
4. Multiprocessing
5. Multitasking
6. Basic commands
7. Working with the file system
8. Process lifecycle


cdac@Mrunali:~/LinuxAssignment$ grep is file.txt
1. What is OS?
cdac@Mrunali:~/LinuxAssignment$ grep OS file.txt
1. What is OS?
2. OS Features
cdac@Mrunali:~/LinuxAssignment$ grep process file.txt
4. Multiprocessing
```

h) System Information:

a. Display the current system date and time.

```
cdac@Mrunali:~/LinuxAssignment$ date
Wed Feb 26 21:04:54 UTC 2025
cdac@Mrunali:~/LinuxAssignment$ cd
cdac@Mrunali:~$ date
Wed Feb 26 21:05:06 UTC 2025
cdac@Mrunali:~$ TZ=Asia/Kolkata date
Thu Feb 27 02:37:15 IST 2025
cdac@Mrunali:~$
```

i) Networking:

a. Display the IP address of the system.

```
cdac@Mrunali:~$ curl ifconfig.me
49.36.83.122cdac@Mrunali:~$ sudo apt install curl
[sudo] password for cdac:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (8.5.0-2ubuntu10.6).
curl set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
cdac@Mrunali:~$ curl ifconfig.me
49.36.83.122cdac@Mrunali:~$
```

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

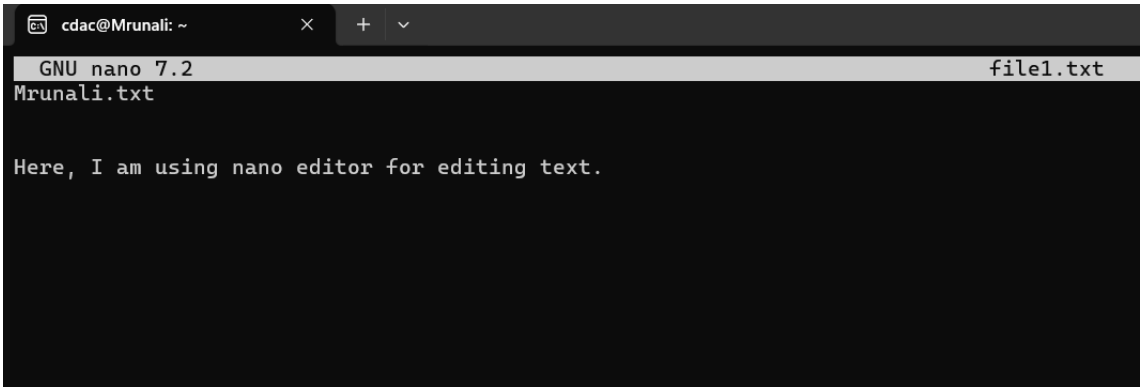
```
cdac@Mrunali:~$ ping -c 4 google.com
PING google.com (142.250.192.238) 56(84) bytes of data.
64 bytes from del11s13-in-f14.1e100.net (142.250.192.238): icmp_seq=1 ttl=52 time=33.7 ms
64 bytes from del11s13-in-f14.1e100.net (142.250.192.238): icmp_seq=2 ttl=52 time=38.2 ms
64 bytes from del11s13-in-f14.1e100.net (142.250.192.238): icmp_seq=3 ttl=52 time=34.7 ms
64 bytes from del11s13-in-f14.1e100.net (142.250.192.238): icmp_seq=4 ttl=52 time=35.4 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 33.676/35.473/38.151/1.658 ms
cdac@Mrunali:~$
```

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.




```
cdac@Mrunali:~$ nano file1.txt
cdac@Mrunali:~$ nano file1.txt
cdac@Mrunali:~$ cat file1.txt
Mrunali.txt


Here, I am using nano editor for editing text.

cdac@Mrunali:~$
```

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@Mrunali:~$
cdac@Mrunali:~$ sed -i 's/Here/Hello Everyone/g' file1.txt
cdac@Mrunali:~$ cat file1.txt
Mrunali.txt


Hello Everyone, I am using nano editor for editing text.

cdac@Mrunali:~$
```

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@Mrunali:~$ cd LinuxAssignment
cdac@Mrunali:~/LinuxAssignment$ touch data.txt
cdac@Mrunali:~/LinuxAssignment$ ls
data.txt  docs  file.txt   file.txt
cdac@Mrunali:~/LinuxAssignment$ echo "There are various module in PG-DAC Course ." >data.txt
cdac@Mrunali:~/LinuxAssignment$ cat data.txt
There are various module in PG-DAC Course .
cdac@Mrunali:~/LinuxAssignment$ nano data.txt
cdac@Mrunali:~/LinuxAssignment$ nano data.txt
cdac@Mrunali:~/LinuxAssignment$ ls
data.txt  docs  file.txt   file.txt
cdac@Mrunali:~/LinuxAssignment$ cat data.txt
There are various module in PG-DAC Course .

1. Operating System
2. Object-Oriented Programming with JAVA
3. Data Structures & Algorithms
4. Database Management System
5. Software Engineering
6. JavaScript
7. React JS
8. Spring Boot
9. Hibernate
10. .NET
11. ProjectWork
12. Cloud Computing
13. Aptitude
```

```
cdac@Mrunali:~/LinuxAssignment$ head -n 10 data.txt
There are various module in PG-DAC Course .

1. Operating System
2. Object-Oriented Programming with JAVA
3. Data Structures & Algorithms
4. Database Management System
5. Software Engineering
6. JavaScript
7. React JS
8. Spring Boot
cdac@Mrunali:~/LinuxAssignment$ head -n 5 data.txt
There are various module in PG-DAC Course .

1. Operating System
2. Object-Oriented Programming with JAVA
3. Data Structures & Algorithms
cdac@Mrunali:~/LinuxAssignment$
```

```
cdac@Mrunali: ~/LinuxAssign
  GNU nano 7.2
There are various module in PG-DAC Course .

1. Operating System
2. Object-Oriented Programming with JAVA
3. Data Structures & Algorithms
4. Database Management System
5. Software Engineering
6. JavaScript
7. React JS
8. Spring Boot
9. Hibernate
10. .NET
11. ProjectWork
12. Cloud Computing
13. Aptitude
```

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@Mrunali:~$ cd LinuxAssignment
cdac@Mrunali:~/LinuxAssignment$ tail -5 data.txt
9. Hibernate
10. .NET
11. ProjectWork
12. Cloud Computing
13. Aptitude
cdac@Mrunali:~/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.

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.