

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@DESKTOP-HRT9N47: ~/LinuxAssignment
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

cdac@DESKTOP-HRT9N47:~$ pwd
/home/cdac
cdac@DESKTOP-HRT9N47:~$ cd
cdac@DESKTOP-HRT9N47:~$ ls
Feb25
cdac@DESKTOP-HRT9N47:~$ mkdir LinuxAssignment
cdac@DESKTOP-HRT9N47:~$ ls
Feb25 LinuxAssignment
cdac@DESKTOP-HRT9N47:~$ cd LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ _
```

b) File Management:

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

```
Select cdac@DESKTOP-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~$ pwd
/home/cdac
cdac@DESKTOP-HRT9N47:~$ ls
Feb25  LinuxAssignment
cdac@DESKTOP-HRT9N47:~$ cd
cdac@DESKTOP-HRT9N47:~$ cd LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ touch file1.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ ls
file1.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ cat file1.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$
```

c) Directory Management:

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

```
cdac@DESKTOP-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ mkdir docs
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ ls
doc docs file1.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$
```

d) Copy and Move Files:

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

```
cdac@DESKTOP-HRT9N47: ~/LinuxAssignment/docs
cdac@DESKTOP-HRT9N47:~$ cp -r /home/cdac/LinuxAssignment/file1.txt /home/cdac/LinuxAssignment/docs/file2.txt
cdac@DESKTOP-HRT9N47:~$ cd LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ cd docs
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$ ls
file2.txt
cdac@DESKTOP-HRT9N47:~/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-HRT9N47: ~/LinuxAssignment/docs
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$ sudo chown $(whoami):$(whoami) file2.txt
[sudo] password for cdac:
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 0 Feb 27 17:32 file2.txt
cdac@DESKTOP-HRT9N47:~/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@DESKTOP-HRT9N47: ~/LinuxAssignment/docs
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$ ls -l
total 0
-rwxr--r-- 1 cdac cdac 0 Feb 27 17:32 file2.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$ ls /
bin          boot  etc   init  lib.usr-is-merged  media  opt   root  sbin          snap  sys  usr
bin.usr-is-merged  dev  home  lib   lib64             mnt    proc  run   sbin.usr-is-merged  srv   tmp  var
cdac@DESKTOP-HRT9N47:~/LinuxAssignment/docs$
```

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).

```
cdac@DESKTOP-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~$ cd LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ find . -type f -name "*.txt"
./docs/file2.txt
./file1.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$
```

h) System Information:

- a. Display the current system date and time.

```
cdac@DESKTOP-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ date
Thu Feb 27 18:01:03 UTC 2025
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$
```

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.

```
cdac@DESKTOP-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ ip a | grep inet
inet 169.254.179.142/16 brd 169.254.255.255 scope global dynamic
inet 192.168.179.45/16 brd 192.168.255.255 scope global dynamic
inet6 fe80::869e:3f43:89ac:72a5/64 scope link dynamic
inet 127.0.0.1/8 brd 127.255.255.255 scope global dynamic
inet6 ::1/128 scope host dynamic
inet 192.168.156.169/24 brd 192.168.156.255 scope global dynamic
inet6 2401:4900:5293:a51a:37ee:4682:290e:c50b/64 scope global dynamic
inet6 2401:4900:5293:a51a:89d2:c29a:7a4e:3e89/128 scope global dynamic
inet6 fe80::f314:2820:6a6d:989b/64 scope link dynamic
inet 169.254.48.225/16 brd 169.254.255.255 scope global dynamic
inet6 fe80::b84:d9b8:1c60:82ab/64 scope link dynamic
inet 169.254.3.233/16 brd 169.254.255.255 scope global dynamic
inet6 fe80::3ab5:e64f:6666:77e3/64 scope link dynamic
inet 169.254.63.75/16 brd 169.254.255.255 scope global dynamic
inet6 fe80::ed69:a5fa:5783:4a2c/64 scope link dynamic
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=59 time=49.3 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=59 time=42.5 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=59 time=42.1 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=59 time=53.2 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=59 time=53.0 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=59 time=35.7 ms
^C
--- 8.8.8.8 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5023ms
rtt min/avg/max/mdev = 35.682/45.963/53.195/6.388 ms
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ zip -r docs.zip docs
```

```
cdac@DESKTOP-HRT9N47: ~  
cdac@DESKTOP-HRT9N47:~$ zip -r docs.zip . -i docs  
zip warning: zip file empty  
cdac@DESKTOP-HRT9N47:~$ mkdir extracted_docs  
cdac@DESKTOP-HRT9N47:~$ unzip docs.zip -d extracted_docs  
Archive: docs.zip  
warning [docs.zip]: zipfile is empty  
cdac@DESKTOP-HRT9N47:~$
```

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@DESKTOP-HRT9N47: ~/LinuxAssignment  
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ nano file1.txt  
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ cat file1.txt  
Education is the foundation of personal  
and societal growth, equipping individuals  
with the knowledge and skills needed to  
navigate the world. It fosters critical  
thinking, creativity,  
and a deeper understanding of diverse  
cultures and perspectives. Through education,  
people can unlock opportunities, improve  
their lives, and contribute to the well-being  
of their communities, shaping a more informed  
and connected global society.  
cdac@DESKTOP-HRT9N47:~/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.

```
cdac@DESKTOP-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ touch data.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ nano data.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ head -n 10 data.txt
First line of data.
Second line of data.
Third line of data.
Fourth line of data.
Fifth line of data.
Sixth line of data.
Seventh line of data.
Eighth line of data.
Ninth line of data.
Tenth line of data.
cdac@DESKTOP-HRT9N47:~/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-HRT9N47:~/LinuxAssignment$ tail -n 5 data.txt
Sixth line of data.
Seventh line of data.
Eighth line of data.
Ninth line of data.
Tenth line of data.
cdac@DESKTOP-HRT9N47:~/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-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ touch number.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ nano number.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ head -n 15 number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$
```

- d. 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-HRT9N47: ~/LinuxAssignment
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ touch input.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ nano input.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$ cat output.txt
AN OPERATING SYSTEM (OS) IS ESSENTIAL SOFTWARE THAT MANAGES HARDWARE RESOURCES AND PROVIDES A PLATFORM FOR RUNNING APPLICATIONS ON A COMPUTER. IT ACTS AS AN INTERMEDIARY BETWEEN THE COMPUTER HARDWARE AND THE SOFTWARE (APPLICATIONS) THAT YOU USE.
cdac@DESKTOP-HRT9N47:~/LinuxAssignment$
```

- e. 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-HRT9N47: ~  
cdac@DESKTOP-HRT9N47:~$ touch duplicate.txt  
cdac@DESKTOP-HRT9N47:~$ nano duplicate.txt  
cdac@DESKTOP-HRT9N47:~$ sort duplicate.txt | uniq  
  
apple  
banana  
cherry  
grape  
orange  
cdac@DESKTOP-HRT9N47:~$ _
```

- f. 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-HRT9N47: ~  
cdac@DESKTOP-HRT9N47:~$ touch fruit.txt  
cdac@DESKTOP-HRT9N47:~$ nano fruit.txt  
cdac@DESKTOP-HRT9N47:~$ sort fruit.txt | uniq -c  
1  
2 apple  
2 banana  
2 mango  
2 orange  
1 papaya  
1 pineapple  
1 star fruit mango  
cdac@DESKTOP-HRT9N47:~$
```