

Assignment 1 – Operating System

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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@Parikshit:/home$ mkdir LinuxAssignment
mkdir: cannot create directory 'LinuxAssignment': Permission denied
cdac@Parikshit:/home$ cd ~
cdac@Parikshit:~$ mkdir LinuxAssignment
cdac@Parikshit:~$ ls
LinuxAssignment  Parikshit.java  dir11
cdac@Parikshit:~$ |
```

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

```
LinuxAssignment  Parikshit.java  dir11
cdac@Parikshit:~$ cd LinuxAssignment
cdac@Parikshit:~/LinuxAssignment$ touch file.txt
cdac@Parikshit:~/LinuxAssignment$ ls
file.txt
cdac@Parikshit:~/LinuxAssignment$ |
```

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

```
LinuxAssignment  Parikshit.java  dir11  docs
cdac@Parikshit:~$ cd LinuxAssignment
cdac@Parikshit:~/LinuxAssignment$ mkdir docs
cdac@Parikshit:~/LinuxAssignment$ ls
docs  file.txt
cdac@Parikshit:~/LinuxAssignment$ |
```

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

```
dac@Parikshit:~$ cd LinuxAssignment
dac@Parikshit:~/LinuxAssignment$ mkdir docs
dac@Parikshit:~/LinuxAssignment$ ls
ocs  file.txt
dac@Parikshit:~/LinuxAssignment$ cp file.txt docs
dac@Parikshit:~/LinuxAssignment$ ls
ocs  file.txt
dac@Parikshit:~/LinuxAssignment$ ls docs
file.txt
dac@Parikshit:~/LinuxAssignment$ cp file.txt docs/file2.txt
dac@Parikshit:~/LinuxAssignment$ ls docs
file.txt  file2.txt
dac@Parikshit:~/LinuxAssignment$ |
```

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@Parikshit:~/cdac$ ls -l file3.txt
-rw-r--r-- 1 cdac cdac 3 Aug 19 09:19 file3.txt
cdac@Parikshit:~/cdac$ chmod 744 file3.txt
cdac@Parikshit:~/cdac$ chown $(whoami) file3.txt
cdac@Parikshit:~/cdac$ ls -l file3.txt
-rwxr--r-- 1 cdac cdac 3 Aug 19 09:19 file3.txt
cdac@Parikshit:~/cdac$ |
```

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@Parikshit:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@Parikshit:~/LinuxAssignment$ ls
docs  file.txt
cdac@Parikshit:~/LinuxAssignment$ cd ~
cdac@Parikshit:~$ la
.bash_history .bash_logout .bashrc .cache .
cdac@Parikshit:~$ ls
LinuxAssignment Parikshit.java dir11 docs
cdac@Parikshit:~$ |
```

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@Parikshit:~/cdac$ ls *.*
file1.txt file2.txt file3.txt file4.txt g1.txt numbers.txt xyz.txt
cdac@Parikshit:~/cdac$ cd dir2
cdac@Parikshit:~/cdac/dir2$ ls *.*
ls: cannot access '*.*': No such file or directory
cdac@Parikshit:~/cdac/dir2$ cd ..
cdac@Parikshit:~/cdac$ head -1 file4.txt
Java
cdac@Parikshit:~/cdac$ grep "CSS" file4.txt
CSS
CSS
cdac@Parikshit:~/cdac$
```

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

```
cdac@Parikshit:~$ date +%D-%T
08/18/25-14:03:23
cdac@Parikshit:~$ |
```

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).

```

cdac@Parikshit:~$ date +%D-%I
08/18/25-14:03:23
cdac@Parikshit:~$ hostname -I
172.22.159.100
cdac@Parikshit:~$ ping -c 4 google.com
PING google.com (142.251.43.14) 56(84) bytes of data.
64 bytes from tsa03s08-in-f14.1e100.net (142.251.43.14): icmp_seq=1 ttl=111 time=38.3 ms
64 bytes from tsa03s08-in-f14.1e100.net (142.251.43.14): icmp_seq=2 ttl=111 time=36.2 ms
64 bytes from tsa03s08-in-f14.1e100.net (142.251.43.14): icmp_seq=3 ttl=111 time=46.7 ms
64 bytes from tsa03s08-in-f14.1e100.net (142.251.43.14): icmp_seq=4 ttl=111 time=36.3 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 36.239/39.396/46.724/4.312 ms
cdac@Parikshit:~$ |

```

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@Parikshit:~/cdac$ cat file2.txt
Hello World
welcome
cdac@Parikshit:~/cdac$ cat >> file2.txt
CDAC Mumbai
cdac@Parikshit:~/cdac$ cat file2.txt
Hello World
welcome
CDAC Mumbai
cdac@Parikshit:~/cdac$ sed -i 's/welcome/thank u/g' file2.txt
cdac@Parikshit:~/cdac$ cat file2.txt
Hello World
thank u
CDAC Mumbai
cdac@Parikshit:~/cdac$ |

```

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.

```
2025cdac@Parikshit:~/cdac$ head -10 data.txt
Hello
Hi
Welcome
Back
To
CDAC
Mumbai
Online
Batch
2025cdac@Parikshit:~/cdac$ |
```

Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.

```
2025cdac@Parikshit:~/cdac$ tail -5 data.txt
CDAC
Mumbai
Online
Batch
2025cdac@Parikshit:~/cdac$ |
```

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.

```
2025cdac@Parikshit:~/cdac$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
0
10
12
13
11111114
cdac@Parikshit:~/cdac$ |
```

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

```
cdac@Parikshit:~/cdac$ tail -3 numbers.txt
12

1144cdac@Parikshit:~/cdac$ tail -n 3 numbers.txt
12

1144cdac@Parikshit:~/cdac$ |
```

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."

```
1144cdac@Parikshit:~/cdac$ touch input.txt
cdac@Parikshit:~/cdac$ cat > input.txt
Hello
Hi
Welcome
Back
To
CDAC
Mumbaicdac@Parikshit:~/cdac$ tr 'a-z' 'A-Z' < input.txt > output.txt
cdac@Parikshit:~/cdac$ cat output.txt
HELLO
HI
WELCOME
BACK
TO
CDAC
MUMBAIcdac@Parikshit:~/cdac$ |
```

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."

```
Hello
cdac@Parikshit:~/cdac$ cat duplicate.txt
Hello
hi
welcome
cdac
hi
Hellocdac@Parikshit:~/cdac$ sort duplicate.txt | uniq
Hello
cdac
hi
hi
welcome
```

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."

```
Orange
cdac@Parikshit:~/C
cdac@Parikshit:~/cdac$ sort fruit.txt | uniq -c
  2 Apple
  2 Banana
  1 Cherray
  2 Grepes
  1 Mango
  1 Orange
  1 Watermelon
  1 Watwemelon
cdac@Parikshit:~/cdac$ sort fruit.txt | uniq -c | sort -nr
  2 Grepes
  2 Banana
  2 Apple
  1 Watwemelon
  1 Watermelon
  1 Orange
  1 Mango
  1 Cherray
cdac@Parikshit:~/cdac$ |
```