

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-7ULKR5D:~$ pwd
/home/cdac
cdac@DESKTOP-7ULKR5D:~$ ls
Feb-25
```

b) File Management:

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

```
cdac@DESKTOP-7ULKR5D:~$ nano file1.txt
cdac@DESKTOP-7ULKR5D:~$ ls file1.txt
file1.txt
cdac@DESKTOP-7ULKR5D:~$ cat file1.txt
Hii
My name is Archisha Rastogi
I am pursuing PG-DAC from CDAC Mumbai.
```

c) Directory Management:

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

```
cdac@DESKTOP-7ULKR5D:~$ mkdir -p docs
cdac@DESKTOP-7ULKR5D:~$ |
```

d) Copy and Move Files:

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

```
cdac@DESKTOP-7ULKR5D:~/LinuxAssignment$ mkdir docs  
cdac@DESKTOP-7ULKR5D:~/LinuxAssignment$ 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.

```
cdac@DESKTOP-7ULKR5D:~/LinuxAssignment$ chmod 777 docs/file2.txt
```

```
cdac@DESKTOP-7ULKR5D:~/LinuxAssignment/docs$ chown cdac file2.txt
```

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-7ULKR5D:~$ ls -l LinuxAssignment  
total 4  
drwxr-xr-x 2 cdac cdac 4096 Feb 27 14:51 docs  
-rw-r--r-- 1 cdac cdac    0 Feb 27 14:49 file1.txt
```

```
cdac@DESKTOP-7ULKR5D:/$ ls -l
total 2448
lrwxrwxrwx    1 root root      7 Apr 22  2024 bin -> usr/bin
drwxr-xr-x    2 root root  4096 Feb 26  2024 bin.usr-is-merged
drwxr-xr-x    2 root root  4096 Apr 22  2024 boot
drwxr-xr-x   16 root root  3580 Feb 27 14:45 dev
drwxr-xr-x   87 root root  4096 Feb 27 14:59 etc
drwxr-xr-x    3 root root  4096 Feb 24 12:25 home
-rwxrwxrwx    1 root root 2424984 Feb 12 00:59 init
lrwxrwxrwx    1 root root      7 Apr 22  2024 lib -> usr/lib
drwxr-xr-x    2 root root  4096 Apr  8  2024 lib.usr-is-merged
lrwxrwxrwx    1 root root      9 Apr 22  2024 lib64 -> usr/lib64
drwx-----   2 root root 16384 Feb 24 12:24 lost+found
drwxr-xr-x    2 root root  4096 Jan  6 20:13 media
drwxr-xr-x    6 root root  4096 Feb 24 12:24 mnt
drwxr-xr-x    2 root root  4096 Jan  6 20:13 opt
dr-xr-xr-x  204 root root      0 Feb 27 14:45 proc
drwx-----   4 root root  4096 Feb 24 12:24 root
drwxr-xr-x   18 root root   540 Feb 27 14:45 run
lrwxrwxrwx    1 root root      8 Apr 22  2024/sbin -> usr/sbin
drwxr-xr-x    2 root root  4096 Mar 31  2024/sbin.usr-is-merged
drwxr-xr-x    6 root root  4096 Feb 26 10:57 snap
drwxr-xr-x    2 root root  4096 Jan  6 20:13 srv
dr-xr-xr-x   11 root root      0 Feb 26 17:09 sys
drwxrwxrwt   11 root root  4096 Feb 27 14:58 tmp
drwxr-xr-x   12 root root  4096 Jan  6 20:13 usr
drwxr-xr-x   13 root root  4096 Feb 24 12:24 var
```

g) File Searching:

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

```
cdac@DESKTOP-7ULKR5D:~$ find -name '*.txt'
./LinuxAssignment/docs/file2.txt
./LinuxAssignment/file1.txt
```

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

```
cdac@DESKTOP-7ULKR5D:~$ cat doc.txt
Hello!!
I am Archisha Rastogi and I am pursuing PG-DAC course from CDAC Mumbai.
cdac@DESKTOP-7ULKR5D:~$ grep "CDAC" doc.txt
I am Archisha Rastogi and I am pursuing PG-DAC course from CDAC Mumbai.
```

h) System Information:

a. Display the current system date and time.

```
cdac@DESKTOP-7ULKR5D:~$ date
Thu Feb 27 15:27:50 UTC 2025
```

```
cdac@DESKTOP-7ULKR5D:~$ date +%d-%m-%Y
27-02-2025
```

i) Networking:

a. Display the IP address of the system.

```
cdac@DESKTOP-7ULKR5D:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:94:0f:de brd ff:ff:ff:ff:ff:ff
    inet 172.22.99.23/20 brd 172.22.111.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe94:fde/64 scope link
        valid_lft forever preferred_lft forever
```

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

```
cdac@DESKTOP-7ULKR5D:~$ ping google.com
PING google.com (142.250.182.174) 56(84) bytes of data:
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=1 ttl=111 time=9.77 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=2 ttl=111 time=11.2 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=3 ttl=111 time=10.2 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=4 ttl=111 time=17.0 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=5 ttl=111 time=12.2 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=6 ttl=111 time=12.0 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=7 ttl=111 time=17.3 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=8 ttl=111 time=15.9 ms
64 bytes from del11s10-in-f14.1e100.net (142.250.182.174): icmp_seq=9 ttl=111 time=11.3 ms
```

j) File Compression:

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

```
cdac@DESKTOP-7ULKR5D:~$ zip -r docs.zip docs
adding: docs/ (stored 0%)
```

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

```
cdac@DESKTOP-7ULKR5D:~$ unzip docs.zip -d LinuxAssignment
Archive:  docs.zip
```

k) File Editing:

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

```
cdac@DESKTOP-7ULKR5D:~$ nano file1.txt
cdac@DESKTOP-7ULKR5D:~$ cat file1.txt

Hello everyone!!!
I belong from Jaipur, Rajasthan.
```

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-7ULKR5D:~$ sed -i 's/everyone/all/g' file1.txt
cdac@DESKTOP-7ULKR5D:~$ cat file1.txt

Hello all!!!
I belong from Jaipur, Rajasthan.
```

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-7ULKR5D:~$ nano data.txt
cdac@DESKTOP-7ULKR5D:~$ head -10 data.txt
CDAC Course Contents:
C++ Programming
Concepts of Operating System
Software Development Methodologies
Object Oriented Programming with Java
Algorithms and Data Structures (Using Java)
Database Technologies
Web Programming Technologies
Web-based Java Programming
Microsoft .Net Technologies
```

- 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-7ULKR5D:~$ tail -5 data.txt
Web Programming Technologies
Web-based Java Programming
Microsoft .Net Technologies
Aptitude & Effective Communication
Project
```

- 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-7ULKR5D:~$ head -n 15 numbers.txt
Line Number 1
Line Number 2
Line Number 3
Line Number 4
Line Number 5
Line Number 6
Line Number 7
Line Number 8
Line Number 9
Line Number 10
Line Number 11
Line Number 12
Line Number 13
Line Number 14
Line Number 15
```

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

```
cdac@DESKTOP-7ULKR5D:~$ tail -n 3 numbers.txt
Line Number 13
Line Number 14
Line Number 15
```

- 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-7ULKR5D:~$ cat input.txt
Converting lowercase letters to uppercase letters
```

```
cdac@DESKTOP-7ULKR5D:~$ nano input.txt
cdac@DESKTOP-7ULKR5D:~$ tr 'a-z' 'A-Z' <input.txt> output.txt
cdac@DESKTOP-7ULKR5D:~$ cat output.txt
CONVERTING LOWERCASE LETTERS TO UPPERCASE LETTERS
```

- 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-7ULKR5D:~$ cat duplicate.txt
Interrupts and system calls
File Related: Open(), Close(). Read(), Write()
File Related: Open(), Close(). Read(), Write()
Process Related: New(), fork(), wait(), running()
Process Related: New(), fork(), wait(), running()
Device Related: read(), uptime, gettime etc.
Device Related: read(), uptime, gettime etc.
Information Related: getpid, getppid, sysdata
Device Related: read(), uptime, gettime etc.
Communication Related (IPC): wait(), notify(), notifyall()
Device Related: read(), uptime, gettime etc.
cdac@DESKTOP-7ULKR5D:~$ uniq duplicate.txt
Interrupts and system calls
File Related: Open(), Close(). Read(), Write()
Process Related: New(), fork(), wait(), running()
Device Related: read(), uptime, gettime etc.
Information Related: getpid, getppid, sysdata
Device Related: read(), uptime, gettime etc.
Communication Related (IPC): wait(), notify(), notifyall()
Device Related: read(), uptime, gettime etc.
```

- 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-7ULKR5D:~$ cat fruit.txt
Orange
Pear
Guava
Apple
Banana
Watermelon
Mango
Apple
Banana
Pear
Watermelon
Grapes
cdac@DESKTOP-7ULKR5D:~$ sort fruit.txt | uniq -c
      2 Apple
      2 Banana
      1 Grapes
      1 Guava
      1 Mango
      1 Orange
      2 Pear
      2 Watermelon
```