

CDAC MUMBAI

Concepts of Operating System Assignment 1

Name - Sudnyan Pal_JH

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.

```
~/LinuxAssignment

sudny@LAPTOP-G2G0K52M ~
$ cd ~

sudny@LAPTOP-G2G0K52M ~
$ ls

sudny@LAPTOP-G2G0K52M ~
$ cd LinuxAssignment
-bash: cd: LinuxAssignment: No such file or directory

sudny@LAPTOP-G2G0K52M ~
$ mkdir LinuxAssignment

sudny@LAPTOP-G2G0K52M ~
$ cd LinuxAssignment

sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$
```

b) **File Management:**

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

```
sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$ touch file1.txt

sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$ cat file1.txt

sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$
```

c) **Directory Management:**

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

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ mkdir docs

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$
```

d) **Copy and Move Files:**

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

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cp file1.txt docs/file2.txt

sudny@LAPTOP-G2GOK52M ~/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.

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ chmod 744 docs/file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ |
```

-Changes the permissions of file2.txt so the owner can read, write, and execute (7), while group and others can only read (4).

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ chown sudny docs/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.

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ ls
docs  file1.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ ls docs
file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ ls /
Cygwin-Terminal.ico  Cygwin.ico  cygdrive  etc  lib  sbin  usr
Cygwin.bat          bin         dev       home  proc tmp  var

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ |

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cd ..

sudny@LAPTOP-G2GOK52M ~
$ ls
LinuxAssignment

sudny@LAPTOP-G2GOK52M ~
$ |
```

g) **File Searching:**

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

```
sudny@LAPTOP-G2GOK52M ~
$ 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)

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/docs
$ nano file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/docs
$ cat file2.txt
hey everyone
how are you today

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/docs
$ grep hey file2.txt
hey everyone

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/docs
$ |
```

h) **System Information:**

- a. Display the current system date and time.

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ date
Fri Feb 28 02:26:19 IST 2025
```

i) **Networking:**

- a. Display the IP address of the system.

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ hostname -I
169.254.174.89 169.254.168.197 169.254.106.162 192.168.1.5
```

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

```
sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ ping google.com

Pinging google.com [142.250.192.78] with 32 bytes of data:
Reply from 142.250.192.78: bytes=32 time=28ms TTL=121
Reply from 142.250.192.78: bytes=32 time=24ms TTL=121
Reply from 142.250.192.78: bytes=32 time=27ms TTL=121
Reply from 142.250.192.78: bytes=32 time=26ms TTL=121

Ping statistics for 142.250.192.78:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 24ms, Maximum = 28ms, Average = 26ms
```

j) **File Compression:**

- a. Compress the "docs" directory into a zip file.
b. Extract the contents of the zip file into a new directory.

Solution-

Zip command was not working so used tar command

- Creating compressed directory : \$ tar -czvf docsarchive.tar.gz docs

- -c: Create an archive.
- -z: Compress the archive with gzip.
- -v: Display progress in the terminal while creating the archive, also known as "verbose" mode. The v is always optional in these commands, but it's helpful.
- -f: Allows you to specify the filename of the archive.

- -x : to extract

- Extracting files : \$ tar -xvzf docsarchive.tar.gz -C d1/

```

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ tar -czvf docsarchive.tar.gz docs
docs/
docs/file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ mkdir d1

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ ls
d1 docs docsarchive.tar.gz file1.txt file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ tar -xzvf docsarchive.tar.gz -c d1/
tar: You may not specify more than one '-Acdrux', '--delete' or '--test-label'
option
Try 'tar --help' or 'tar --usage' for more information.

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ tar -xzvf docsarchive.tar.gz -C d1/
docs/
docs/file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cd d1

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/d1
$ ls
docs

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/d1
$ cd docs

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/d1/docs
$ ls
file2.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment/d1/docs
$

```

k) **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).

```

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat file1.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ nano file1.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat file1.txt
hey hi
how are you today?

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ sed -i 's/today/doing/g' file1.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat file1.txt
hey hi
how are you doing?

sudny@LAPTOP-G2GOK52M ~/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.
- b. Now, to check the end of the file for any recent additions, display the last 5 lines of "data.txt" using another command.

```
sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$ touch data.txt

sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$ nano data.txt

sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$ head -10 data.txt
A
B
C
D
E
F
G
H
I
J

sudny@LAPTOP-G2G0K52M ~/LinuxAssignment
$ tail -5 data.txt
G
H
I
J
K

sudny@LAPTOP-G2G0K52M ~/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".

```

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ touch numbers.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ nano numbers.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ tail -3 numbers.txt
13
14
15

sudny@LAPTOP-G2GOK52M ~/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."

```

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ touch input.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ nano input.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat input.txt
This is Lowercase to Uppercase

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ touch output.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ tr a-z A-Z < ./input.txt > output.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat input.txt
This is Lowercase to Uppercase

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat output.txt
THIS IS LOWERCASE TO UPPERCASE

sudny@LAPTOP-G2GOK52M ~/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."

```

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ touch duplicate.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ nano duplicate.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat duplicate.txt

Duplicate
Original
Original
Done

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ uniq duplicate.txt

Duplicate
Original
Done

sudny@LAPTOP-G2GOK52M ~/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."

```

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ touch fruit.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ nano fruit.txt

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ sort fruit.txt | uniq -c
      2 Apple
      2 Banana
      2 Raspberry

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$ cat fruit.txt
Apple
Banana
Raspberry
Banana
Raspberry
Apple

sudny@LAPTOP-G2GOK52M ~/LinuxAssignment
$

```