

Concepts of OS

Assignment 1

Mrunal Shedge _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.

```
cdac@mrunal: ~  
cdac@mrunal:~$ cd  
cdac@mrunal:~$ ls  
LinuxAssignment myfile.txt  
cdac@mrunal:~$ mkdir Assignment  
cdac@mrunal:~$ ls  
Assignment LinuxAssignment myfile.txt  
cdac@mrunal:~$  
cdac@mrunal:~$ ~|
```

b) File Management:

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

```
cdac@mrunal: ~/LinuxAssigni  
cdac@mrunal:~/LinuxAssignment$ nano file1.txt  
cdac@mrunal:~/LinuxAssignment$ ls  
file1.txt  
cdac@mrunal:~/LinuxAssignment$ cat file.txt  
cat: file.txt: No such file or directory  
cdac@mrunal:~/LinuxAssignment$ cat file1.txt  
mrunal  
nishnat  
xax  
dsc  
ddc  
  
cdac@mrunal:~/LinuxAssignment$ ~|
```

c) Directory Management:

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

```
cdac@mrunal: ~/LinuxAssigni  
cdac@mrunal:~/LinuxAssignment$ mkdir docs  
cdac@mrunal:~/LinuxAssignment$ ls  
docs file1.txt  
cdac@mrunal:~/LinuxAssignment$ |
```

d) Copy and Move Files:

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

```
cdac@mrunal: ~/LinuxAssignn × + v
cdac@mrunal:~/LinuxAssignment$ cp file1.txt file2.txt
cdac@mrunal:~/LinuxAssignment$ mv file2.txt docs
cdac@mrunal:~/LinuxAssignment$ ls
docs  file1.txt
cdac@mrunal:~/LinuxAssignment$ cd docs
cdac@mrunal:~/LinuxAssignment/docs$ ls
file2.txt
cdac@mrunal:~/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@mrunal: ~/LinuxAssignn × + v
cdac@mrunal:~/LinuxAssignment/docs$ ls -l file2.txt
-rw-r--r-- 1 cdac cdac 29 Feb 27 15:28 file2.txt
cdac@mrunal:~/LinuxAssignment/docs$ chmod og-rwx file2.txt
cdac@mrunal:~/LinuxAssignment/docs$ chown cdac file2.txt
cdac@mrunal:~/LinuxAssignment/docs$ ls -l file2.txt
-rw----- 1 cdac cdac 29 Feb 27 15:28 file2.txt
cdac@mrunal:~/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@mrunal: ~/LinuxAssignn × + v
cdac@mrunal:~$ ls
Assignment LinuxAssignment myfile.txt
cdac@mrunal:~$ cd LinuxAssignment
cdac@mrunal:~/LinuxAssignment$ ls
docs  file1.txt
cdac@mrunal:~/LinuxAssignment$ cd docs
cdac@mrunal:~/LinuxAssignment/docs$ ls
file2.txt
cdac@mrunal:~/LinuxAssignment/docs$
```

g) File Searching:

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

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

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

```
cdac@nobeuno:~/LinuxAssignments$ ls  
data.txt docs docs1.zip duplicate.txt file1.txt fruit.txt input.txt newdocs numbers.txt output.txt  
cdac@nobeuno:~/LinuxAssignments$ cat duplicate.txt  
apple  
banana  
cherry  
apple  
grape  
kiwi  
banana  
orange  
grape  
mango  
pear  
cherry  
cdac@nobeuno:~/LinuxAssignments$ grep "apple" duplicate.txt  
apple  
apple  
cdac@nobeuno:~/LinuxAssignments$ |
```

h) System Information:

a. Display the current system date and time.

```
cdac@mrunal: ~/LinuxAssignn  
cdac@mrunal:~/LinuxAssignment$ date  
Thu Feb 27 17:12:17 UTC 2025
```

i) Networking:

a. Display the IP address of the system.

```
cdac@mrunal: ~/LinuxAssignm  X + v
cdac@mrunal:~/LinuxAssignment$ ipconfig.exe

Windows IP Configuration

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 11:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : hgu_lan
    Link-local IPv6 Address . . . . . : fe80::e708:91a8:f2b1:2966%8
    IPv4 Address. . . . . : 192.168.1.45
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Ethernet adapter vEthernet (WSL (Hyper-V firewall)):

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::3964:fd1b:8e9d:25f4%46
    IPv4 Address. . . . . : 172.30.48.1
    Subnet Mask . . . . . : 255.255.240.0
    Default Gateway . . . . . :
cdac@mrunal:~/LinuxAssignment$
```

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

```
cdac@mrunal: ~/LinuxAssignm  X + v
cdac@mrunal:~/LinuxAssignment$ ping -c 5 google.com
PING google.com (142.250.199.142) 56(84) bytes of data:
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=1 ttl=119 time=4.37 ms
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=2 ttl=119 time=17.4 ms
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=3 ttl=119 time=6.02 ms
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=4 ttl=119 time=4.06 ms
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=5 ttl=119 time=296 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4132ms
rtt min/avg/max/mdev = 4.060/65.586/296.087/115.354 ms
cdac@mrunal:~/LinuxAssignment$
```

j) File Compression:

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

```
cdac@mrunal: ~/LinuxAssignm × + v
cdac@mrunal:~/LinuxAssignment$ sudo apt install zip
[sudo] password for cdac:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  unzip
The following NEW packages will be installed:
  unzip zip
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 350 kB of archives.
After this operation, 933 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 unzip amd64 6.0-28ubuntu4.1 [174 kB]
Err:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 zip amd64 3.0-13ubuntu0.1
      404 Not Found [IP: 91.189.91.82 80]
Fetched 174 kB in 2s (71.4 kB/s)
E: Failed to fetch http://archive.ubuntu.com/ubuntu/pool/main/z/zip/zip_3.0-13ubuntu0.1_amd64.deb 404 Not Found [IP: 91.189.91.82 80]
E: Unable to fetch some archives, maybe run apt-get update or try with --fix-missing?
cdac@mrunal:~/LinuxAssignment$
```

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

```
cdac@nobeuno:~/LinuxAssignments$ ls
data.txt docs docs1.zip duplicate.txt file1.txt fruit.txt input.txt numbers.txt output.txt
cdac@nobeuno:~/LinuxAssignments$ unzip docs1.zip -d newdocs
Archive: docs1.zip
creating: newdocs/docs/
extracting: newdocs/docs/file2.txt
cdac@nobeuno:~/LinuxAssignments$ ls
data.txt docs docs1.zip duplicate.txt file1.txt fruit.txt input.txt newdocs numbers.txt output.txt
cdac@nobeuno:~/LinuxAssignments$ |
```

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@mrunal: ~/LinuxAssignm × + v
cdac@mrunal:~/LinuxAssignment$ ls
Docs.gz compressdemo docs file1.txt
cdac@mrunal:~/LinuxAssignment$ nano file1.txt
cdac@mrunal:~/LinuxAssignment$ cat file1.txt
cat: file1.txt: command not found
cdac@mrunal:~/LinuxAssignment$ cat file1.txt
Hello my name is Mrunal Shedge
I'm 21 years old.
cdac@mrunal:~/LinuxAssignment$ sed -i 's/ahead/always/g' file.txt
sed: can't read file.txt: No such file or directory
cdac@mrunal:~/LinuxAssignment$ sed -i 's/ahead/always/g' file1.txt
cdac@mrunal:~/LinuxAssignment$ cat file1.txt
Hello my name is Mrunal Shedge
I'm 21 years old.
cdac@mrunal:~/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@mrunal: ~/LinuxAssigni  X  +  v
cdac@mrunal:~/LinuxAssignment$ nano data.txt
cdac@mrunal:~/LinuxAssignment$ head -3 data.txt
Mrunal
Nishant
Harshada
cdac@mrunal:~/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@mrunal: ~/LinuxAssigni  X  +  v
cdac@mrunal:~/LinuxAssignment$ tail -3 data.txt
Nishant
Harshada
Sandhya
cdac@mrunal:~/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@mrunal: ~/LinuxAssigni  X  +  v
cdac@mrunal:~/LinuxAssignment$ head -5 number.txt
12
45
23
6
45
cdac@mrunal:~/LinuxAssignment$ |
```

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

```
cdac@mrunal: ~/LinuxAssignn  X  +  v
cdac@mrunal:~/LinuxAssignment$ tail -3 number.txt
23
56
45
cdac@mrunal:~/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."

```
cdac@nobeuno:~/LinuxAssignments$ nano input.txt
cdac@nobeuno:~/LinuxAssignments$ cat input.txt
this is lowercase

THIS IS UPPERCASE

$P3C14L C#4R4CT3R$

1234567890
cdac@nobeuno:~/LinuxAssignments$ tr [:lower:] [:upper:] < input.txt > output.txt
cdac@nobeuno:~/LinuxAssignments$ cat output.txt
THIS IS LOWERCASE

THIS IS UPPERCASE

$P3C14L C#4R4CT3R$

1234567890
```

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@mrunal: ~/LinuxAssignn  X  +  v
cdac@mrunal:~/LinuxAssignment$ nano duplicate.txt
cdac@mrunal:~/LinuxAssignment$ cat duplicate.txt
apple
mango
pineapple
lichi
grape
cherry
pear
banana
kiwi
dragon

cdac@mrunal:~/LinuxAssignment$ cat duplicate.txt | sort | uniq

apple
banana
cherry
dragon
grape
kiwi
lichi
mango
pear
pineapple
cdac@mrunal:~/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."

```
cdac@mrunal: ~/LinuxAssignn  ×  +  ∨  
cdac@mrunal:~/LinuxAssignment$ nano fruit.txt  
cdac@mrunal:~/LinuxAssignment$ nano fruit.txt  
cdac@mrunal:~/LinuxAssignment$ y  
y: command not found  
cdac@mrunal:~/LinuxAssignment$ cat fruit.txt  
apple  
kiwi  
cherry  
pine  
pineapple  
lichi  
guava  
lichi  
dragon  
cdac@mrunal:~/LinuxAssignment$ cat fruit.txt | sort | uniq  
apple  
cherry  
dragon  
guava  
kiwi  
lichi  
pine  
pineapple  
cdac@mrunal:~/LinuxAssignment$ |
```