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.

cd
mkdir LinuxAssignment
ls

```
cdac@Abhay:~$ cd
cdac@Abhay:~$ mkdir LinuxAssignment
cdac@Abhay:~$ ls
LinuxAssignment
```

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

cd LinuxAssignment
touch file1.txt
Cat file1.txt

```
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ touch file1.txt
cdac@Abhay:~/LinuxAssignment$ cat file1.txt
cdac@Abhay:~/LinuxAssignment$
```

cd LinuxAssignment
nano file1.txt
Cat file1.txt

```
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ nano file1.txt
cdac@Abhay:~/LinuxAssignment$ cat file1.txt
This is file1.
cdac@Abhay:~/LinuxAssignment$
```

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

cd LinuxAssignment
mkdir docs

```
cdac@Abhay:~$ cd
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ mkdir docs
cdac@Abhay:~/LinuxAssignment$
```

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

cd
cp LinuxAssignment/file1.txt LinuxAssignment/docs/file2.txt

```
cdac@Abhay:~$ cp LinuxAssignment/file1.txt LinuxAssignment/docs/file2.txt
cdac@Abhay:~$ ls
LinuxAssignment  docs
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Abhay:~/LinuxAssignment$ cd docs
cdac@Abhay:~/LinuxAssignment/docs$ ls
file2.txt
cdac@Abhay:~/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.

cd
cd LinuxAssignment
cd docs
chmod u=rwx file2.txt

```
cdac@Abhay:~/LinuxAssignment/docs$ chmod u=rwx file2.txt
cdac@Abhay:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 15 Aug 28 22:06 file2.txt
cdac@Abhay:~/LinuxAssignment/docs$
```

sudo chown $(whoami) file2.txt

```
cdac@Abhay:~/LinuxAssignment/docs$ sudo chown $(whoami) file2.txt
cdac@Abhay:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 15 Aug 28 22:06 file2.txt
cdac@Abhay:~/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.

ls
ls LinuxAssignment

```
cdac@Abhay:~$ ls
LinuxAssignment
cdac@Abhay:~$ ls LinuxAssignment
docs  file1.txt
```

g) File Searching:
a. Search for all files with the extension ".txt" in the current directory and its subdirectories.

ls
cd LinuxAssignment
ls
cd docs
ls

```
cdac@Abhay:~$ ls
LinuxAssignment
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Abhay:~/LinuxAssignment$ cd docs
cdac@Abhay:~/LinuxAssignment/docs$ ls
file2.txt
cdac@Abhay:~/LinuxAssignment/docs$
```

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

grep “This” file1.txt

```
cdac@Abhay:~/LinuxAssignment$ grep "This" file1.txt
This is file1.
cdac@Abhay:~/LinuxAssignment$
```

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

date

```
cdac@Abhay:~$ date
Thu Aug 29 09:51:05 IST 2024
cdac@Abhay:~$
```

i) Networking:
a. Display the IP address of the system.

hostname –i

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

ping www.google.com

```
cdac@Abhay:~$ ping www.google.com
PING www.google.com (142.250.183.100) 56(84) bytes of data.
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=1 ttl=114 time=35.3 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=2 ttl=114 time=48.8 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=3 ttl=114 time=39.2 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=4 ttl=114 time=46.8 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=5 ttl=114 time=44.9 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=6 ttl=114 time=65.8 ms
64 bytes from bom12s13-in-f4.1e100.net (142.250.183.100): icmp_seq=7 ttl=114 time=62.2 ms
```

j) File Compression:

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

sudo apt install zip
zip docs.zip LinuxAssignment/docs

```
cdac@Abhay:~$ zip docs.zip LinuxAssignment/docs
  adding: LinuxAssignment/docs/ (stored 0%)
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Abhay:~/LinuxAssignment$ ls docs
file2.txt
cdac@Abhay:~/LinuxAssignment$ cd
cdac@Abhay:~$ ls
LinuxAssignment  docs.zip
```

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

unzip docs.zip -d exdocs

```
cdac@Abhay:~$ ls
LinuxAssignment  docs.zip
cdac@Abhay:~$ mkdir exdocs
cdac@Abhay:~$ unzip docs.zip -d exdocs
Archive:  docs.zip
   creating: exdocs/LinuxAssignment/docs/
cdac@Abhay:~$ ls
LinuxAssignment  docs.zip  exdocs
cdac@Abhay:~$ cd exdocs
```

k) File Editing:

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

cd LinuxAssignment
nano file1.txt

```
cdac@Abhay:~$ ls
LinuxAssignment  docs.zip  exdocs
cdac@Abhay:~$ cd LinuxAssignment
cdac@Abhay:~/LinuxAssignment$ ls
docs  file1.txt
cdac@Abhay:~/LinuxAssignment$ nano file1.txt
cdac@Abhay:~/LinuxAssignment$
```

```
Hi,
This is file1.
this is question K: file editing
```

b. Replace a specific word in the "file1.txt" file with another word (provide the original word and the word to replace it with).

cd LinuxAssignment
sed ‘s/Hi/Welcome/g’ file1.txt

```
cdac@Abhay:~/LinuxAssignment$ sed 's/Hi/Welcome/g' file1.txt
Welcome,
This is file1.
this is question K: file editing
cdac@Abhay:~/LinuxAssignment$
```

(Here s is for substitute and g is for global which will change all the Hi present in the file with Welcome)

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.

head data.txt

```
cdac@Abhay:~$ head data.txt
hi
how
are
you
?
I
am
fine
.
what
cdac@Abhay:~$
```

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

tail –5 data.txt

```
cdac@Abhay:~$ tail -5 data.txt
about
you
my
friend
?
cdac@Abhay:~$
```

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.

head –15 numbers.txt

```
cdac@Abhay:~$ nano numbers.txt
cdac@Abhay:~$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@Abhay:~$
```

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

tail –3 numbers.txt

```
cdac@Abhay:~$ tail -3 numbers.txt
18
19
20
cdac@Abhay:~$
```

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."

tr '[:lower:]' '[:upper:]' < input.txt > output.txt
cat output.txt

```
cdac@Abhay:~$ tr '[:lower:]' '[:upper:]' < input.txt > output.txt
cdac@Abhay:~$ cat output.txt
GOOD MORNING, HOW ARE YOU?
cdac@Abhay:~$
```

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."

uniq duplicate.txt

```
cdac@Abhay:~$ nano duplicate.txt
cdac@Abhay:~$ uniq duplicate.txt
hi

good

morning

?
cdac@Abhay:~$
```

```
hi
hi
hi

good
good
good
good

morning
morning

?
```

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."

sort fruit.txt | uniq -c

```
cdac@Abhay:~$ nano fruit.txt
cdac@Abhay:~$ sort fruit.txt | uniq -c
      3
      3 apple
      1 banana
      4 mango
      2 watermelon
cdac@Abhay:~$
```

Sort is used to sort containt.
| is used to combine both commands.
-c is used for count.