Assignment no. 1

Operating System

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.**

Ans :

1. Open ubuntu and get started with password and going to cdac as a user
2. Used pwd command to show the present directory.

```
cdac@LAPTOP-HJG23I52:~$ pwd
/home/cdac
```

3. Use ‘ls’ command to list the items in the directory.
4. Since I do not have directory named "LinuxAssignment" use ‘mkdir’ command to make a directory.
5. After that cd command to go the into directory named "LinuxAssignment".

```
cdac@LAPTOP-HJG23I52:~$ ls
day20S  file2.txt  file3  file3.txt  first.txt
cdac@LAPTOP-HJG23I52:~$ mkdir LinuxAssignment
cdac@LAPTOP-HJG23I52:~$ ls
LinuxAssignment  day20S  file2.txt  file3  file3.txt  first.txt
cdac@LAPTOP-HJG23I52:~$ cd LinuxAssignment
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$
```

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

Ans:

1. To create a file we have many methods I am using ‘touch’ command which is used to create a file named ‘file1.txt’ Another method can be to use ‘nano <filename with extension>’ to create and write the contents in that file.
2. To show the contents of file use ‘cat’ command.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ touch file1.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ ls
file1.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat file.txt
cat: file.txt: No such file or directory
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat file1.txt
i
am
payal
gajbe
nice
to
meet
you
have
a
good
day
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$
```

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

Ans:

1. Used ‘mkdir’ command to make a new directory inside "LinuxAssignment" directory.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ mkdir docs
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ ls
docs  file1.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$
```

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

Ans:

1. To copy the file contents use ‘cp <source file> <target file>’ command to copy the content of file1 to file2.
2. To rename the file use ‘mv <oldname> <newname>’ command.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cp -r file1.txt. file2.txt
cp: cannot stat 'file1.txt.': No such file or directory
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cp file1.txt docs
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cd docs
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ ls
file1.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ rename file1.txt file2.txt
Command 'rename' not found, but can be installed with:
sudo apt install rename
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ cat file2.txt
i
am
payal
gajbe
nice
to
meet
you
have
a
good
day
cdac@LAPTOP-HJG23I52:~/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.**

Ans:

1. Use chmod command to change the permissions for the file.
2. Since I can not visit my root folder I am unable to change the ownership.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ ls -l
total 4
-rw-r--r-- 1 cdac cdac 54 Aug 28 18:39 file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ chmod u+rwx g-r o+r file2.txt
chmod: cannot access 'g-r': No such file or directory
chmod: cannot access 'o+r': No such file or directory
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 54 Aug 28 18:39 file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ chmod g-r, o+r file2.txt
chmod: invalid mode: ‘g-r,’
Try 'chmod --help' for more information.
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ chmod g-r file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ chmod a+r file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 54 Aug 28 18:39 file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ chmod g-r file2.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/docs$ ls -l
total 4
-rwx---r-- 1 cdac cdac 54 Aug 28 18:39 file2.txt
cdac@LAPTOP-HJG23I52:~/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.**

Ans:

```
cdac@LAPTOP-HJG23I52:~$ ls -l
total 20
drwxr-xr-x 3 cdac cdac 4096 Aug 28 18:29 LinuxAssignment
drwxr-xr-x 2 cdac cdac 4096 Aug 28 09:03 day2OS
-rw-r--r-- 1 cdac cdac   23 Aug 28 10:45 file2.txt
-rw-r--r-- 1 cdac cdac    0 Aug 28 10:50 file3
-rw-r--r-- 1 cdac cdac   12 Aug 28 10:50 file3.txt
-rw-r--r-- 1 cdac cdac   33 Aug 28 10:30 first.txt
cdac@LAPTOP-HJG23I52:~$
```

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).**

Ans:

1. Use “find -type f -name “*.txt” command this Is a combination of various commands in this ‘find’ command is used to search. “-type f”command is the type of file and ‘-name “*.txt” ‘is to search for a file with extension txt.

```
cdac@LAPTOP-HJG23I52:~$ find -type f -name "*.txt"
./file3.txt
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file2.txt
./file2.txt
./first.txt
./day2OS/day2.txt
cdac@LAPTOP-HJG23I52:~$
```

```
cdac@LAPTOP-HJG23I52:~$ grep "a" file2.txt
am
payal
gajbe
cdac@LAPTOP-HJG23I52:~$
```

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

Ans:

1. Use ‘date’ to view the current date and time.

```
cdac@LAPTOP-HJG23I52:~$ date
Wed Aug 28 19:22:16 IST 2024
cdac@LAPTOP-HJG23I52:~$
```

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).**

Ans:

1. Use ‘hostname -I’ command to get the Ip address of the system.

```
cdac@LAPTOP-HJG23I52:~$ hostname -I
```

2. Use ‘ping <url>’ command to ping a remote server.

```
cdac@LAPTOP-HJG23I52:~$ ping "www.google.com"
PING www.google.com (142.250.70.36) 56(84) bytes of data.
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=1 ttl=117 time=5.18 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=2 ttl=117 time=4.57 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=3 ttl=117 time=30.0 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=4 ttl=117 time=5.65 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=5 ttl=117 time=8.48 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=6 ttl=117 time=5.95 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=7 ttl=117 time=10.8 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=8 ttl=117 time=5.55 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=9 ttl=117 time=15.3 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=10 ttl=117 time=4.70 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=11 ttl=117 time=4.86 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=12 ttl=117 time=4.54 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=13 ttl=117 time=13.2 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=14 ttl=117 time=4.36 ms
64 bytes from pnbomb-aa-in-f4.1e100.net (142.250.70.36): icmp_seq=15 ttl=117 time=12.4 ms
^C
--- www.google.com ping statistics ---
15 packets transmitted, 15 received, 0% packet loss, time 14011ms
rtt min/avg/max/mdev = 4.361/9.034/30.029/6.622 ms
cdac@LAPTOP-HJG23I52:~$
```

j. File Compression: a. Compress the "docs" directory into a zip file. b. Extract the contents of the zip file into a new directory.

Ans:

1. To zip a directory use ‘zip -r <zip file name> <directory name> ’.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ zip -r docs . -i filedocs
        zip warning: zip file empty
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  filedocs.txt
```

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ unzip docs.zip -d newdocs
Archive:  docs.zip
warning [docs.zip]:  zipfile is empty
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ ls
docs  docs.zip  file1.txt  filedocs.txt  newdocs
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cd newdocs
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/newdocs$ ls
cdac@LAPTOP-HJG23I52:~/LinuxAssignment/newdocs$
```

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).

Ans:

1. Used ‘sed’ which is Stream EDitor(SED).
2. The syntax is “sed -i ‘s/old-text/new-text/g’ <filename.txt>”
3. The -i tells to update the file. The / is the default delimiter, but it can be any character other than a backslash (\) or newline (\n) can be used instead of a slash (/) to delimit the regex and the replacement.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat file1.txt
i
am
payal
gajbe
glad
to
meet
you
have
a
good
day
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ sed -i 's/glad/nice/g' file1.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat file1.txt
i
am
payal
gajbe
nice
to
meet
you
have
a
good
day
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$
```

Problem 2: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

- 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.
  Ans:
  1. Use 'head' command to display first 10 lines of any file. The default is 10 lines but can be modified to user requirements by 'head -<number of lines> <filename.txt>'

```
cdac@LAPTOP-HJG23I52:~$ cd LinuxAssignment/
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ nano Data.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ head Data.txt
This
is
a
practice
question
of
Assignment
no.
1
of
cdac@LAPTOP-HJG23I52:~/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.

Ans:
Use ‘tail’ command to display last 10 lines of any file. The default is 10 lines but can be modified to user requirements by ‘tail -<number of lines> <filename.txt>’

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ tail -5 Data.txt
operating
systems
and
shell
scripting
```

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.
Ans: ‘head -<number of lines> <filename.txt>’ used.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

d. To focus on the last few numbers of the dataset, display the last 3 lines of "numbers.txt".
ans: ‘tail -<number of lines> <filename.txt>’ used.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ tail -3 numbers.txt
18
19
20
```

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."
ans:

1. Use ‘tr’ command which is used for translating and deleting characters.
2. ‘a-z A-Z < ./input.txt’ is to show that file is to be converted from lower case to upper case of file input.txt.
3. ‘>>’ is used to store that files output into output.txt.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ tr a-z A-Z < ./input.txt >> output.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ ls
Data.txt  docs  docs.zip  file1.txt  filedocs.txt  input.txt  newdocs  numbers.txt  output.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat output.txt
I AM PAYAL GAJBE
cdac@LAPTOP-HJG23I52:~/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."
Ans:

1. ‘|’ pipe command is used to join commands.
2. ‘sort’ is used to sort the file.
3. ‘uniq’ is used to find unique in the file.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ nano duplicate.txt
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat duplicate.txt | sort | uniq
black
green
orange
pink
red
cdac@LAPTOP-HJG23I52:~/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."
Ans:

1. ‘unqi -c ‘ is used to count the unique in the file.

```
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$ cat fruits.txt | sort | uniq -c
      2
      2 banana
      1 grapes
      2 pear
cdac@LAPTOP-HJG23I52:~/LinuxAssignment$
```