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.

- **Navigate and List:**
  Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.
  Solution :

```
ankur@DESKTOP-JUHC8MO:~$ cd /home
ankur@DESKTOP-JUHC8MO:/home$ ls
ankur
ankur@DESKTOP-JUHC8MO:/home$
ankur@DESKTOP-JUHC8MO:~$ cd /home
ankur@DESKTOP-JUHC8MO:/home$ mkdir LinuxAssignment
mkdir: cannot create directory ‘LinuxAssignment’: Permission denied
ankur@DESKTOP-JUHC8MO:/home$ sudo mkdir LinuxAssignment
[sudo] password for ankur:
ankur@DESKTOP-JUHC8MO:/home$ cd LinuxAssignment
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$
```

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

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ sudo touch file1.txt
[sudo] password for ankur:
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ cat file1.txt
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$
```

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

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ sudo mkdir docs
[sudo] password for ankur:
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$
```

- **Copy and Move Files:**

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

Solution :

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ sudo cp file1.txt docs
[sudo] password for ankur:
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ ls
docs  file1.txt
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ cd docs
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$ ls
file1.txt
root@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs# mv file1.txt file2.txt
root@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs# ls
file2.txt
```

- **Permissions and Ownership:**
  - 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.

Solution :

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$ sudo chmod 744 file2.txt
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$ l -l
total 0
-rwxr--r-- 1 root root 0 Feb 27 07:35 file2.txt*
```

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$ sudo chown ankur file2.txt
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$ ls -l
total 0
-rwxr--r-- 1 ankur root 0 Feb 27 07:35 file2.txt
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$
```

- **Final Checklist:**
  - Finally, list the contents of the "LinuxAssignment" directory and the root directory to ensure that all operations were performed correctly.

Solution :

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment$ ls
docs  file1.txt
ankur@DESKTOP-JUHC8MO:/home$ ls
LinuxAssignment  ankur
```

- **File Searching:**
  - Search for all files with the extension ".txt" in the current directory and its subdirectories.

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# find . -name '*.txt'
./docs/file2.txt
./file1.txt
```

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

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# grep -n "Text4" file1.txt
4:Text4
8:Text4
```

- **System Information:**
  Display the current system date and time.
  Solution :

```
ankur@DESKTOP-JUHC8MO:/home/LinuxAssignment/docs$ date
Thu Feb 27 07:40:32 UTC 2025
```

- **Networking:**
  - Display the IP address of the system.

Solution :

```
ankur@DESKTOP-JUHC8MO:~$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet [redacted] netmask 255.255.255.0  broadcast [redacted]
        inet6 [redacted]  prefixlen 64  scopeid 0x0<global>
        inet6 [redacted]  prefixlen 128  scopeid 0x0<global>
        inet6 [redacted] prefixlen 64  scopeid 0xfd<compat,link,site,host>
        ether d8:bb:c1:5e:c1:1e  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

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

Solution :

```
ankur@DESKTOP-JUHC8MO:~$ ping www.google.co.in
PING www.google.co.in (2404:6800:4002:820::2003) 56 data bytes
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=1 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=2 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=3 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=4 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=5 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=6 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=7 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=8 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=9 ttl=
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=10 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=11 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=12 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=13 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=14 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=15 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=16 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=17 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=18 ttl
64 bytes from del12s03-in-x03.1e100.net (2404:6800:4002:820::2003): icmp_seq=19 ttl
^C
--- www.google.co.in ping statistics ---
19 packets transmitted, 19 received, 0% packet loss, time 18012ms
rtt min/avg/max/mdev = 29.322/39.990/48.684/4.724 ms
```

- **File Compression:**
  - Compress the "docs" directory into a zip file.

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# zip -r compressed_docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# ls
compressed_docs.zip  docs  file1.txt
```

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

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# unzip compressed_docs.zip -d /docs
Archive:  compressed_docs.zip
   creating: /docs/docs/
```

- **File Editing:**
    - Open the "file1.txt" file in a text editor and add some text to it.

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# nano text1.txt
```

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

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# cat file1.txt
Text1
Text2
Text3
Text4
Text5
Text6
Text7
Text4
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# sed 's/Text7/Text8/g' file1.txt
Text1
Text2
Text3
Text4
Text5
Text6
Text8
Text4
```

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.

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# cat data.txt
apple
banana
cherry
dog
elephant
forest
grape
house
island
jungle
kite
lemon
mountain
notebook
ocean
penguin
river
sinshine
tiger
```

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# head data.txt
apple
banana
cherry
dog
elephant
forest
grape
house
island
jungle
```

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

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# tail -5 data.txt
penguin
river
sinshine
tiger
```

- 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.

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# head -n 15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
```

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

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# tail -n 3 numbers.txt
18
19
20
```

- 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."

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# cat input.txt
this is a sample text
text will be converted to upper case
result will be saved in the outpur file
```

root@DESKTOP-JUHC8MO:/home/LinuxAssignment# cat input.txt | tr '[:lower:]' '[:upper:]' > output.txt

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# cat output.txt
THIS IS A SAMPLE TEXT
TEXT WILL BE CONVERTED TO UPPER CASE
RESULT WILL BE SAVED IN THE OUTPUR FILE
```

- 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."

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# cat duplicate.txt
apple
banana
apple
cherry
banana
date
cherry
elderberry
fig
fig
grape
```

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# sort duplicate.txt | uniq
apple
banana
cherry
date
elderberry
fig
grape
```

- 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."

Solution :

```
root@DESKTOP-JUHC8MO:/home/LinuxAssignment# sort fruit.txt | uniq -c
      4 apple
      3 banana
      2 cherry
      2 grape
```

Submission Guidelines:

- Document each step of your solution and any challenges faced.
- Upload it on your GitHub repository

Additional Tips:

- Experiment with different options and parameters of each command to explore their functionalities.