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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.

```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# cd $HOME  
root@LAPTOP-6994IH1L:~# ls -l  
total 12  
drwxr-xr-x 3 root root 4096 Feb 26 09:52 Feb25  
drwxr-xr-x 2 root root 4096 Feb 27 13:41 LinuxAssignment  
drwxr-xr-x 3 root root 4096 Feb 26 09:55 OS3  
-rw-r--r-- 1 root root 0 Feb 26 10:22 xyz.txt  
root@LAPTOP-6994IH1L:~# ls -d LinuxAssignment  
LinuxAssignment  
root@LAPTOP-6994IH1L:~# |
```

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b) File Management:

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

```
root@LAPTOP-6994IH1L: ~/Li  
root@LAPTOP-6994IH1L:~# ls  
Feb25 LinuxAssignment OS3 xyz.txt  
root@LAPTOP-6994IH1L:~# cd ~/LinuxAssignment  
root@LAPTOP-6994IH1L:~/LinuxAssignment# touch file1.txt  
root@LAPTOP-6994IH1L:~/LinuxAssignment# cat file1.txt  
root@LAPTOP-6994IH1L:~/LinuxAssignment# echo "This is a test file." > file1.txt  
root@LAPTOP-6994IH1L:~/LinuxAssignment# cat file1.txt  
This is a test file.  
root@LAPTOP-6994IH1L:~/LinuxAssignment#
```

c) Directory Management:

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

```
root@LAPTOP-6994IH1L:~/LinuxAssignment# mkdir docs
root@LAPTOP-6994IH1L:~/LinuxAssignment# ls -l
total 8
drwxr-xr-x 2 root root 4096 Feb 27 13:50 docs
-rw-r--r-- 1 root root 21 Feb 27 13:48 file1.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment# |
```

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d) Copy and Move Files:

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

```
root@LAPTOP-6994IH1L: ~/Li × + ▾
root@LAPTOP-6994IH1L:~/LinuxAssignment# cp file1.txt docs/file2.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment# ls -l docs
total 4
-rw-r--r-- 1 root root 21 Feb 27 13:54 file2.txt
root@LAPTOP-6994IH1L:~/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.

```
root@LAPTOP-6994IH1L: ~/Li × + ▾
root@LAPTOP-6994IH1L:~/LinuxAssignment# cd ~/LinuxAssignment/docs
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# chmod 744 file2.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# ls -l file2.txt
-rwxr--r-- 1 root root 21 Feb 27 13:54 file2.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# chown $(whoami) file2.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# ls -l file2.txt
-rwxr--r-- 1 root root 21 Feb 27 13:54 file2.txt
root@LAPTOP-6994IH1L:~/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.

```
root@LAPTOP-6994IH1L: ~/Li × + v
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# ls -l ~/LinuxAssignment/docs
total 4
-rwxr--r-- 1 root root 21 Feb 27 13:54 file2.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# ls -l /
total 2448
lrwxrwxrwx 1 root root 7 Apr 22 2024 bin -> usr/bin
drwxr-xr-x 2 root root 4096 Feb 26 2024 bin.usr-is-merged
drwxr-xr-x 2 root root 4096 Apr 22 2024 boot
drwxr-xr-x 16 root root 3580 Feb 27 13:44 dev
drwxr-xr-x 87 root root 4096 Feb 27 13:44 etc
drwxr-xr-x 2 root root 4096 Feb 24 12:44 home
-rwxrwxrwx 1 root root 2424984 Feb 12 00:59 init
lrwxrwxrwx 1 root root 7 Apr 22 2024 lib -> usr/lib
drwxr-xr-x 2 root root 4096 Apr 8 2024 lib.usr-is-merged
lrwxrwxrwx 1 root root 9 Apr 22 2024 lib64 -> usr/lib64
drwx----- 2 root root 16384 Feb 24 12:42 lost+found
drwxr-xr-x 2 root root 4096 Jan 6 20:13 media
drwxr-xr-x 5 root root 4096 Feb 24 12:42 mnt
drwxr-xr-x 2 root root 4096 Jan 6 20:13 opt
dr-xr-xr-x 228 root root 0 Feb 27 13:44 proc
drwx----- 7 root root 4096 Feb 27 13:41 root
drwxr-xr-x 18 root root 540 Feb 27 13:44 run
lrwxrwxrwx 1 root root 8 Apr 22 2024/sbin -> usr/sbin
drwxr-xr-x 2 root root 4096 Mar 31 2024/sbin.usr-is-merged
drwxr-xr-x 2 root root 4096 Feb 24 12:42 snap
drwxr-xr-x 2 root root 4096 Jan 6 20:13 srv
dr-xr-xr-x 11 root root 0 Feb 27 13:44 sys
drwxrwxrwt 11 root root 4096 Feb 27 13:45 tmp
drwxr-xr-x 12 root root 4096 Jan 6 20:13 usr
drwxr-xr-x 13 root root 4096 Feb 24 12:42 var
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# |
```

g) File Searching:

- Search for all files with the extension ".txt" in the current directory and its subdirectories.
- Display lines containing a specific word in a file (provide a file name and the specific word to search).

```
root@LAPTOP-6994IH1L: ~/Li × + v
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# find . -type f -name "*.txt"
./file2.txt
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# ./file1.txt
./docs/file2.txt
-bash: ./file1.txt: No such file or directory
-bash: ./docs/file2.txt: No such file or directory
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# grep "search-word" filename.txt
grep: filename.txt: No such file or directory
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# grep "Linux" file1.txt
grep: file1.txt: No such file or directory
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# grep -i "linux" file1.txt
grep: file1.txt: No such file or directory
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# grep -r "search-word" .
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# G|
```

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h) System Information:

a. Display the current system date and time.

```
root@LAPTOP-6994IH1L: ~/Li × + v
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# date
Thu Feb 27 14:04:10 UTC 2025
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# H|
```

i) Networking:

a. Display the IP address of the system.

```
root@LAPTOP-6994IH1L: ~/Li × + v
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether 00:15:5d:2c:5a:7c brd ff:ff:ff:ff:ff:ff
    inet 172.25.80.74/20 brd 172.25.95.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe2c:5a7c/64 scope link
        valid_lft forever preferred_lft forever
root@LAPTOP-6994IH1L:~/LinuxAssignment/docs# |
```

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

```
root@LAPTOP-6994IH1L: ~ × + v
root@LAPTOP-6994IH1L:~# ping -c 4 google.com
PING google.com (142.250.192.78) 56(84) bytes of data.
64 bytes from bom12s16-in-f14.1e100.net (142.250.192.78): icmp_seq=1 ttl=52 time=60.9 ms
64 bytes from bom12s16-in-f14.1e100.net (142.250.192.78): icmp_seq=2 ttl=52 time=246 ms
64 bytes from bom12s16-in-f14.1e100.net (142.250.192.78): icmp_seq=3 ttl=52 time=67.6 ms
64 bytes from bom12s16-in-f14.1e100.net (142.250.192.78): icmp_seq=4 ttl=52 time=199 ms

--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3006ms
rtt min/avg/max/mdev = 60.926/143.345/245.897/80.844 ms
root@LAPTOP-6994IH1L:~# i.b|
```

j) File Compression:

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

```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# zip -r docs.zip docs  
Command 'zip' not found, but can be installed with:  
apt install zip  
root@LAPTOP-6994IH1L:~# mkdir extracted_docs  
root@LAPTOP-6994IH1L:~# unzip docs.zip -d extracted_docs  
Command 'unzip' not found, but can be installed with:  
apt install unzip  
root@LAPTOP-6994IH1L:~# j|
```

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).

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.

```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# cat > data.txt <<EOF  
line 1: Introduction  
line 2: Overview  
line 3: Linux Basics  
line 4: Commands  
line 5: File Handling  
line 6: Permissions  
line 7: Networking  
line 8: System Monitoring  
line 9: Troubleshooting  
line 10: Conclusion  
line 11: Extra Information  
line 12: Notes  
EOF  
root@LAPTOP-6994IH1L:~# head -n 10 data.txt  
line 1: Introduction  
line 2: Overview  
line 3: Linux Basics  
line 4: Commands  
line 5: File Handling  
line 6: Permissions  
line 7: Networking  
line 8: System Monitoring  
line 9: Troubleshooting  
line 10: Conclusion  
root@LAPTOP-6994IH1L:~# |
```

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

```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# tail -n 5 data.txt  
Line 8: System Monitoring  
Line 9: Troubleshooting  
Line 10: Conclusion  
Line 11: Extra Information  
Line 12: Notes  
root@LAPTOP-6994IH1L:~# 2.B|
```

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.

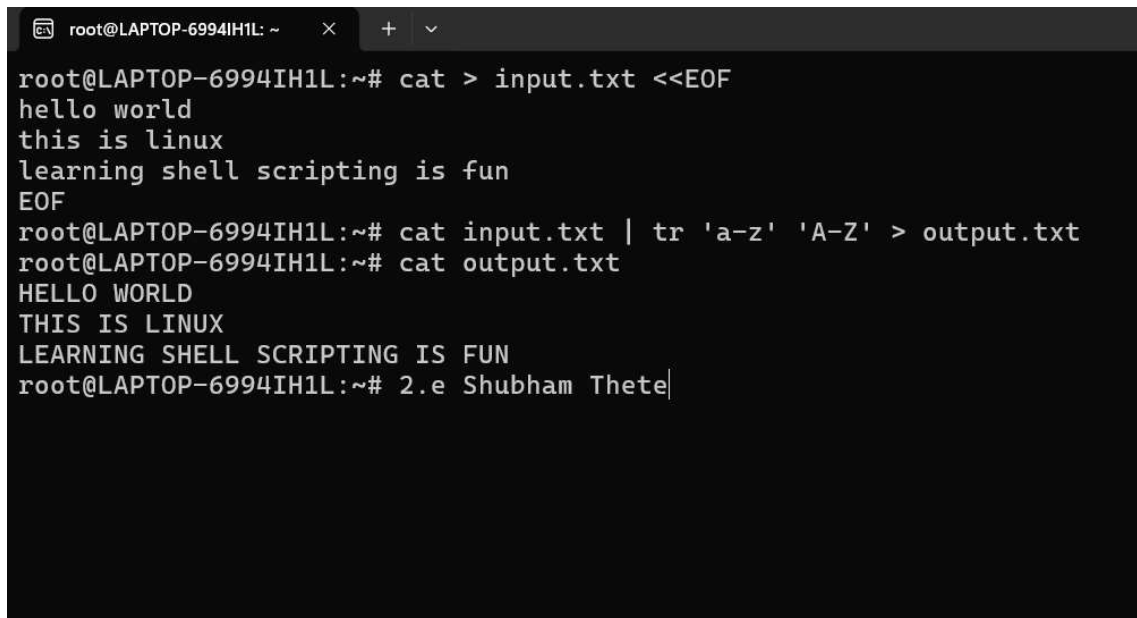
```
root@LAPTOP-6994IH1L: ~  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
EOF  
root@LAPTOP-6994IH1L:~# head -n 15 numbers.txt  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
root@LAPTOP-6994IH1L:~# 2.3 Shubham Thete productions|
```

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

```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# tail -n 3 numbers.txt  
18  
19  
20  
root@LAPTOP-6994IH1L:~# 2.d|
```

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."

A terminal window with a dark background and light gray text. The window title bar shows 'root@LAPTOP-6994IH1L: ~' and standard window controls. The terminal content shows a sequence of commands and their outputs. First, 'cat > input.txt <<EOF' is used to create a file with the text 'hello world', 'this is linux', and 'learning shell scripting is fun'. Then, 'cat input.txt | tr 'a-z' 'A-Z' > output.txt' is used to create a new file with the uppercase version of the text. Finally, 'cat output.txt' is used to display the contents of the new file, showing 'HELLO WORLD', 'THIS IS LINUX', and 'LEARNING SHELL SCRIPTING IS FUN'. The prompt 'root@LAPTOP-6994IH1L:~# 2.e Shubham Thete|' is visible at the bottom.

```
root@LAPTOP-6994IH1L:~# cat > input.txt <<EOF
hello world
this is linux
learning shell scripting is fun
EOF
root@LAPTOP-6994IH1L:~# cat input.txt | tr 'a-z' 'A-Z' > output.txt
root@LAPTOP-6994IH1L:~# cat output.txt
HELLO WORLD
THIS IS LINUX
LEARNING SHELL SCRIPTING IS FUN
root@LAPTOP-6994IH1L:~# 2.e Shubham Thete|
```

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."


```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# cat > duplicate.txt <<EOF  
apple  
banana  
apple  
orange  
banana  
grape  
orange  
mango  
grape  
apple  
EOF  
root@LAPTOP-6994IH1L:~# sort duplicate.txt | uniq  
apple  
banana  
grape  
mango  
orange  
root@LAPTOP-6994IH1L:~# uniq duplicate.txt  
apple  
banana  
apple  
orange  
banana  
grape  
orange  
mango  
grape  
apple  
root@LAPTOP-6994IH1L:~# 2.f Shubham Thete |
```

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."

```
root@LAPTOP-6994IH1L: ~  
root@LAPTOP-6994IH1L:~# cat > fruit.txt <<EOF  
apple  
banana  
apple  
orange  
banana  
grape  
orange  
mango  
grape  
apple  
banana  
EOF  
root@LAPTOP-6994IH1L:~# sort fruit.txt | uniq -c  
      3 apple  
      3 banana  
      2 grape  
      1 mango  
      2 orange  
root@LAPTOP-6994IH1L:~# 2.g Shubham c Thete|
```

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