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Concept Of Operating System Assignment 1 Solution

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@LAPTOP-GTALLG7T: ~  
cdac@LAPTOP-GTALLG7T:~$ pwd  
/home/cdac  
cdac@LAPTOP-GTALLG7T:~$ ls  
cdac@LAPTOP-GTALLG7T:~$ mkdir LinuxAssignment  
cdac@LAPTOP-GTALLG7T:~$ ls  
LinuxAssignment  
cdac@LAPTOP-GTALLG7T:~$ |
```

b) File Management:

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

```
cdac@LAPTOP-GTALLG7T: ~/l  
cdac@LAPTOP-GTALLG7T:~$ cd LinuxAssignment/  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ touch file1.txt  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ nano file1.txt  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat file1.txt  
Hello, My name is Sohail Khan and this is my first OS assignment!  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

c) **Directory Management:**

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

```
cdac@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ mkdir docs
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ ls
docs  file1.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ |
```

d) **Copy and Move Files:**

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

```
cdac@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cd docs/
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ cat file2.txt
Hello, My name is Sohail Khan and this is my first OS assignment!
cdac@LAPTOP-GTALLG7T:~/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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cp file1.txt docs/file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cd docs/
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ cat file2.txt
Hello, My name is Sohail Khan and this is my first OS assignment!
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 66 Feb 27 16:57 file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ chown $(whoami) file2.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/docs$ ls -l
total 4
-rwxr--r-- 1 cdac cdac 66 Feb 27 16:57 file2.txt
```

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@LAPTOP-GTALLG7T: ~ × + v
cdac@LAPTOP-GTALLG7T:~$ ls -l LinuxAssignment/
total 8
drwxr-xr-x 2 cdac cdac 4096 Feb 27 16:57 docs
-rw-r--r-- 1 cdac cdac 66 Feb 27 16:49 file1.txt
cdac@LAPTOP-GTALLG7T:~$ ls -l LinuxAssignment/docs/
total 4
-rwxr--r-- 1 cdac cdac 66 Feb 27 16:57 file2.txt
cdac@LAPTOP-GTALLG7T:~$ ls -l
total 4
drwxr-xr-x 3 cdac cdac 4096 Feb 27 16:55 LinuxAssignment
cdac@LAPTOP-GTALLG7T:~$ |
```

g) **File Searching:**

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

```
cdac@LAPTOP-GTALLG7T: ~  
cdac@LAPTOP-GTALLG7T:~$ find . -type f -name "*.txt"  
./LinuxAssignment/file1.txt  
./LinuxAssignment/docs/file2.txt  
cdac@LAPTOP-GTALLG7T:~$
```

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

```
cdac@LAPTOP-GTALLG7T: ~/l  
cdac@LAPTOP-GTALLG7T:~$ cd LinuxAssignment/  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ grep "Sohail" file1.txt  
Hello, My name is Sohail Khan and this is my first OS assignment!  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

h) **System Information:**

- a. Display the current system date and time.

```
cdac@LAPTOP-GTALLG7T: ~/l  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ date  
Thu Feb 27 17:21:27 UTC 2025  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

i) **Networking:**

- a. Display the IP address of the system.

```
cdac@LAPTOP-GTALLG7T: ~  
cdac@LAPTOP-GTALLG7T:~$ 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:cc:3a:46 brd ff:ff:ff:ff:ff:ff  
    inet 172.22.106.138/20 brd 172.22.111.255 scope global eth0  
        valid_lft forever preferred_lft forever  
    inet6 fe80::215:5dff:fecc:3a46/64 scope link  
        valid_lft forever preferred_lft forever  
cdac@LAPTOP-GTALLG7T:~$
```


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

```
cdac@LAPTOP-GTALLG7T: ~  
cdac@LAPTOP-GTALLG7T:~$ ping 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=60 time=4.90 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=2 ttl=60 time=4.44 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=3 ttl=60 time=3.36 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=4 ttl=60 time=3.56 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=5 ttl=60 time=3.31 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=6 ttl=60 time=3.69 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=7 ttl=60 time=3.42 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=8 ttl=60 time=14.0 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=9 ttl=60 time=3.88 ms  
64 bytes from bom07s36-in-f14.1e100.net (142.250.199.142): icmp_seq=10 ttl=60 time=7.90 ms
```

j) **File Compression:**

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

```
cdac@LAPTOP-GTALLG7T: ~/l  
cdac@LAPTOP-GTALLG7T:~$ cd LinuxAssignment/  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ zip -r docs.zip docs  
adding: docs/ (stored 0%)  
adding: docs/file2.txt (deflated 2%)  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ ls -l  
total 12  
drwxr-xr-x 2 cdac cdac 4096 Feb 27 16:57 docs  
-rw-r--r-- 1 cdac cdac 381 Feb 27 17:28 docs.zip  
-rw-r--r-- 1 cdac cdac 66 Feb 27 16:49 file1.txt  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

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

```
cdac@LAPTOP-GTALLG7T: ~/l  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ mkdir new_doc  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cd new_doc/  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment/new_doc$ cd ..  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ unzip docs.zip -d new_doc/  
Archive: docs.zip  
creating: new_doc/docs/  
inflating: new_doc/docs/file2.txt  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ ls -l new_doc/  
total 4  
drwxr-xr-x 2 cdac cdac 4096 Feb 27 16:57 docs  
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

k) **File Editing:**

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

```
cdac@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat file1.txt
Hello, My name is Sohail Khan and this is my first OS assignment!
I have successfully added new text.
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

- 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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ sed -i 's/new/the/' file1.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat file1.txt
Hello, My name is Sohail Khan and this is my first OS assignment!
I have successfully added the text.
cdac@LAPTOP-GTALLG7T:~/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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ touch data.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ nano data.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ head -10 data.txt
India 11
Rohit
Gill
Virat
Iyer
KL
Jaddu
Hardik
Axar
Kuldeep
cdac@LAPTOP-GTALLG7T:~/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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ tail -5 data.txt
Hardik
Axar
Kuldeep
Shami
Harshit
cdac@LAPTOP-GTALLG7T:~/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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ touch numbers.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ nano numbers.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ head -15 numbers.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```

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

```
cdac@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ seq 1 100 > numbers.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ tail -3 numbers.txt
98
99
100
cdac@LAPTOP-GTALLG7T:~/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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ touch input.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ nano input.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat input.txt
hey there, this text was initially written in lower case.
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat input.txt | tr 'a-z' 'A-Z' > output.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat output.txt
HEY THERE, THIS TEXT WAS INITIALLY WRITTEN IN LOWER CASE.
cdac@LAPTOP-GTALLG7T:~/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."

```
cdac@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat duplicate.txt
India
Aus
Aus
Eng
SA
Final
Final
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ sort duplicate.txt | uniq
Aus
Eng
Final
India
SA
cdac@LAPTOP-GTALLG7T:~/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@LAPTOP-GTALLG7T: ~/l × + v
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ touch fruit.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ nano fruit.txt
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ cat fruit.txt
mango
apple
apple
orange
pineapple
mango
banana
orange
kiwi
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$ sort fruit.txt | uniq -c
  2 apple
  1 banana
  1 kiwi
  2 mango
  2 orange
  1 pineapple
cdac@LAPTOP-GTALLG7T:~/LinuxAssignment$
```