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Concepts of Operating System

Assignment 1

Problem 1:

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@SwapnilDhotre:~$ pwd
/home/cdac
cdac@SwapnilDhotre:~$ ls -l
total 8
drwxr-xr-x 2 cdac cdac 4096 Aug 28 11:24 directory_name
-rw------- 1 cdac cdac   39 Aug 29 21:01 file.txt.save
-rw-r--r-- 1 cdac cdac    0 Aug 28 11:38 sudo_as_admin_successful
cdac@SwapnilDhotre:~$ mkdir LinuxAssignment.txt
cdac@SwapnilDhotre:~$
```

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

```
cdac@SwapnilDhotre:~/LinuxAssignment$ nano file1.txt
cdac@SwapnilDhotre:~/LinuxAssignment$ cat file1.txt
Hello Everyone !!
cdac@SwapnilDhotre:~/LinuxAssignment$
```

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

```
cdac@SwapnilDhotre:~/LinuxAssignment$ nano file1.txt
cdac@SwapnilDhotre:~/LinuxAssignment$ cat file1.txt
Hello Everyone !!
cdac@SwapnilDhotre:~/LinuxAssignment$ mkdir docs
cdac@SwapnilDhotre:~/LinuxAssignment$ _
```

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

```
cdac@SwapnilDhotre:~/LinuxAssignment$ mkdir docs
cdac@SwapnilDhotre:~/LinuxAssignment$ pwd
/home/cdac/LinuxAssignment
cdac@SwapnilDhotre:~/LinuxAssignment$ ls
docs
cdac@SwapnilDhotre:~/LinuxAssignment$ ls -l
total 4
drwxr-xr-x 2 cdac cdac 4096 Aug 30 22:46 docs
cdac@SwapnilDhotre:~/LinuxAssignment$ cp file1.txt /docs
cp: cannot stat 'file1.txt': No such file or directory
cdac@SwapnilDhotre:~/LinuxAssignment$ ls -l
total 4
drwxr-xr-x 2 cdac cdac 4096 Aug 30 22:46 docs
cdac@SwapnilDhotre:~/LinuxAssignment$ mv docs /file2.txt
```

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@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ pwd
/home/cdac/LinuxAssignment/docs/file2.txt/docs
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ ls -l
total 4
drwxr-xr-x 2 cdac cdac 4096 Aug 30 22:56 file2.txt
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ chmod u+rwx file2.txt
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ chmod o-wx file2.txt
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ ls -l
total 4
drwxr-xr-- 2 cdac cdac 4096 Aug 30 22:56 file2.txt
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ sudo chown cdac
```

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@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt/docs$ cd ..
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt$ ls -l
total 4
drwxr-xr-x 3 cdac cdac 4096 Aug 30 22:56 docs
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt$
cdac@SwapnilDhotre:~/LinuxAssignment/docs/file2.txt$ cd ..
cdac@SwapnilDhotre:~/LinuxAssignment/docs$ ls -s
total 4
4 file2.txt
cdac@SwapnilDhotre:~/LinuxAssignment/docs$ |
```

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).

```
uir. cannot access  /u .txt . no such rite or uirectory
cdac@SwapnilDhotre:~/LinuxAssignment$ dir /s /b *.txt
dir: cannot access '/s': No such file or directory
dir: cannot access '/b': No such file or directory
Swapnil.txt:

assignment.txt:

file1.txt:

file2.txt:

linux.txt:
cdac@SwapnilDhotre:~/LinuxAssignment$
```

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

```
cdac@SwapnilDhotre:~/LinuxAssignment/LinuxAssignment.txt/file2.txt$ pwd
/home/cdac/LinuxAssignment/LinuxAssignment.txt/file2.txt
cdac@SwapnilDhotre:~/LinuxAssignment/LinuxAssignment.txt/file2.txt$ date
Mon Sep  2 22:07:20 IST 2024
cdac@SwapnilDhotre:~/LinuxAssignment/LinuxAssignment.txt/file2.txt$
```

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

```
cdac@SwapnilDhotre:~/LinuxAssignment/LinuxAssignment.txt/file2.txt$ ip addr show
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:ac:78:71 brd ff:ff:ff:ff:ff:ff
    inet 172.29.80.54/20 brd 172.29.95.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:feac:7871/64 scope link
       valid_lft forever preferred_lft forever
cdac@SwapnilDhotre:~/LinuxAssignment/LinuxAssignment.txt/file2.txt$
```

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

```
cdac@SwapnilDhotre:~/LinuxAssignment/LinuxAssignment.txt/file2.txt$ ping google.com
PING google.com (142.250.183.206) 56(84) bytes of data.
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=1 ttl=118 time=16.4 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=2 ttl=118 time=24.7 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=3 ttl=118 time=39.8 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=4 ttl=118 time=38.4 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=5 ttl=118 time=37.5 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=6 ttl=118 time=34.8 ms
```

j) **File Compression**:

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

```
cdac@DESKTOP-RJF4UPC:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (stored 0%)
cdac@DESKTOP-RJF4UPC:~/LinuxAssignment$
```

| docs | 28-08-2024 23:44 | File folder | |
| docs.zip | 29-08-2024 01:15 | Compressed (zipped)... | 1 KB |

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

```
cdac@DESKTOP-RJF4UPC:~/LinuxAssignment$ unzip docs.zip -d extracted_docs
Archive:  docs.zip
   creating: extracted_docs/docs/
 extracting: extracted_docs/docs/file2.txt
cdac@DESKTOP-RJF4UPC:~/LinuxAssignment$
```

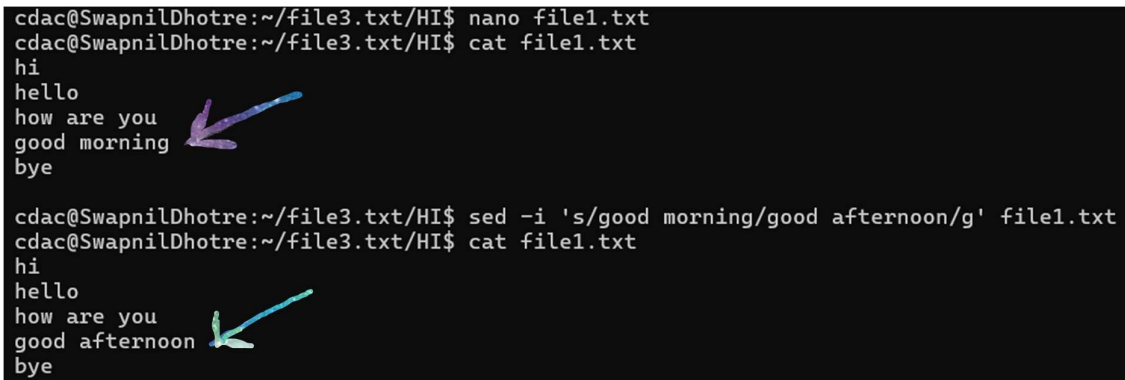| extracted_docs | 29-08-2024 01:19 | File folder | |
| docs.zip | 29-08-2024 01:15 | Compressed (zipped)... | 1 KB |

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

```
cdac@SwapnilDhotre:~$ nano file1.txt
cdac@SwapnilDhotre:~$ cat file1.txt
Hi i am Swapnil Dhotre
cdac@SwapnilDhotre:~$
```

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@SwapnilDhotre:~/file3.txt/HI$ nano file1.txt
cdac@SwapnilDhotre:~/file3.txt/HI$ cat file1.txt
hi
hello
how are you
good morning
bye

cdac@SwapnilDhotre:~/file3.txt/HI$ sed -i 's/good morning/good afternoon/g' file1.txt
cdac@SwapnilDhotre:~/file3.txt/HI$ cat file1.txt
hi
hello
how are you
good afternoon
bye
```

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@SwapnilDhotre:~/file3.txt/HI$ nano data.txt
cdac@SwapnilDhotre:~/file3.txt/HI$ cat data.txt
hi
hello
how are you
good morning
good afternon
where do you live
where are you from
where are you
hello
good evening
do you like cricket
what is your hobby
what is your college name
ok
thats great
yes
ok
bye

cdac@SwapnilDhotre:~/file3.txt/HI$ head -10 data.txt
hi
hello
how are you
good morning
good afternon
where do you live
where are you from
where are you
hello
good evening
cdac@SwapnilDhotre:~/file3.txt/HI$ |
```

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@SwapnilDhotre:~/file3.txt/HI$ nano data.txt
cdac@SwapnilDhotre:~/file3.txt/HI$ cat data.txt
hi
hello
how are you
good morning
good afternon
where do you live
where are you from
where are you
hello
good evening
do you like cricket
what is your hobby
what is your college name
ok
thats great
yes
ok
bye

cdac@SwapnilDhotre:~/file3.txt/HI$ tail -5 data.txt
thats great
yes
ok
bye
```

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@SwapnilDhotre:~/number.txt$ nano number.txt
cdac@SwapnilDhotre:~/number.txt$ cat number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
cdac@SwapnilDhotre:~/number.txt$ head -15 number.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".

```
cdac@SwapnilDhotre:~/duplicate.txt/input.txt/LinuxAssignment/number.txt$ nano number.txt
cdac@SwapnilDhotre:~/duplicate.txt/input.txt/LinuxAssignment/number.txt$ cat number.txt
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
cdac@SwapnilDhotre:~/duplicate.txt/input.txt/LinuxAssignment/number.txt$ tail -3 number.txt
20
21
22
cdac@SwapnilDhotre:~/duplicate.txt/input.txt/LinuxAssignment/number.txt$ tail -n 3 number.txt
20
21
22
```

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@SwapnilDhotre:~/data.txt$ mkdir input.txt
cdac@SwapnilDhotre:~/data.txt$ cd input.txt
cdac@SwapnilDhotre:~/data.txt/input.txt$ nano input.txt
cdac@SwapnilDhotre:~/data.txt/input.txt$ cat input.txt
hi
hello
how are you
today is sunday
where are you
good morning
good afternoon
ok
thank you
good
ok
bye

cdac@SwapnilDhotre:~/data.txt/input.txt$ tr 'a-z' 'A-Z' < input.txt >  output.txt
cdac@SwapnilDhotre:~/data.txt/input.txt$ cat output.txt
HI
HELLO
HOW ARE YOU
TODAY IS SUNDAY
WHERE ARE YOU
GOOD MORNING
GOOD AFTERNOON
OK
THANK YOU
GOOD
OK
BYE
```

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@SwapnilDhotre:~/duplicate.txt$ nano duplicate.txt
cdac@SwapnilDhotre:~/duplicate.txt$ cat duplicate.txt
hi
hello
how are you
i am fine
good morning
good afternoon
today is sunday
where are you
you are from which city
ok
thankyou
bye

cdac@SwapnilDhotre:~/duplicate.txt$ sort duplicate.txt | uniq

bye
good afternoon
good morning
hello
hi
how are you
i am fine
ok
thankyou
today is sunday
where are you
you are from which city
cdac@SwapnilDhotre:~/duplicate.txt$
```

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@SwapnilDhotre:~$ touch fruit.txt
cdac@SwapnilDhotre:~$ nano fruit.txt
cdac@SwapnilDhotre:~$ sort fruit.txt

  Strawbery
  Strawbery
  apple
  apple
  apple
  banana
  banana
  mango
  mango
cdac@SwapnilDhotre:~$ sort fruit.txt | uniq -c
      1
      2     Strawbery
      3     apple
      2     banana
      2     mango
cdac@SwapnilDhotre:~$
```