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CDAC MUMBAI
Concepts of Operating System
Assignment 1

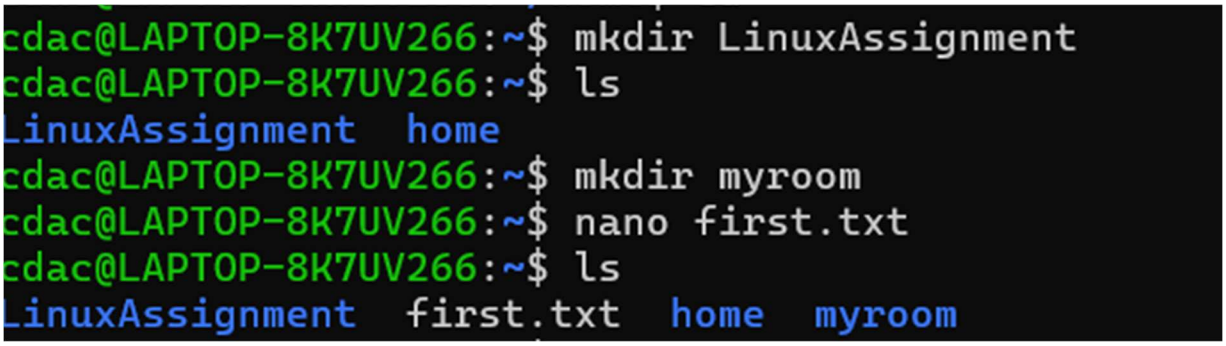
Problem 1: Read the instructions carefully and answer accordingly. If there is any need to insert some data then do that as well.

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.

Answer:ls lists the content in the directory. And mkdir creates new directory.

cdac@LAPTOP-8K7UV266:~$ ls
first.txt home myroom
cdac@LAPTOP-8K7UV266:~$ mkdir LinuxAssignment
cdac@LAPTOP-8K7UV266:~$ ls
LinuxAssignment first.txt home myroom



b) File Management:

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

Answer:We can use "touch or nano" command to create new file. 'cat' command used to display the content.

cdac@LAPTOP-8K7UV266:~$ cd LinuxAssignment/
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cat file1.txt

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cat file.txt
cat: file.txt: No such file or directory
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cat file1.txt
Let's name football teams:
Barcelona
Real madrid
Liverpool
Manchester United
Manchester city
atletico madrid
napoli
AC milan
Juventes
Bayern Munich
Spurs
Lester city
```

c) Directory Management:

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

Answer:mkdir is used to create new dictory named "docs" in LinuxAssignment directory.

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ mkdir docs

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls

docs file1.txt

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$
docs  file1.txt
```

d) Copy and Move Files:

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

Answer: cp command is used to copy data from one file to another.

Syntax :cp <original_file> .<duplicatefile>

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cp file1.txt ./docs/file2.txt

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cd docs

cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ ls

file2.txt

cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ cat file2.txt

```
docs  file1.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cp file1.txt ./docs/file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs  file1.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cd docs
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ ls
file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ cat file2.txt
Let's name football teams:
Barcelona
Real madrid
Liverpool
Manchester United
Manchester city
atletico madrid
napoli
AC milan
Juventes
Bayern Munich
Spurs
Lester city
```

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.

Answer: “ls -l” command displays the permissions associated with the files in that directory , And “chmod” command helps in updating the permissions for these files.
And “chown” command is used to change the owner of the files.

cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ ls -l
total 4
-rw-rw-r-- 1 cdac cdac 167 Aug 28 21:21 file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ chmod u+x file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ ls -l
total 4
-rwxrw-r-- 1 cdac cdac 167 Aug 28 21:21 file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ chown -v cdac file2.txt
ownership of 'file2.txt' retained as cdac

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ ls -l
total 4
-rw-rw-r-- 1 cdac cdac 167 Aug 28 21:21 file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ chmod u+x file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ ls -l
total 4
-rwxrw-r-- 1 cdac cdac 167 Aug 28 21:21 file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/docs$ chown -v cdac file2.txt
ownership of 'file2.txt' retained as 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.

Answer: Here we have used ls to display contentes in the root directory and LinuxAssignment.

Root:

cdac@LAPTOP-8K7UV266:~$ ls
LinuxAssignment first.txt home myroom

LinuxAssignent:

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs file1.txt

g) File Searching:

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

Answer:here are three different ways to find the files with particular extension.

Method1:

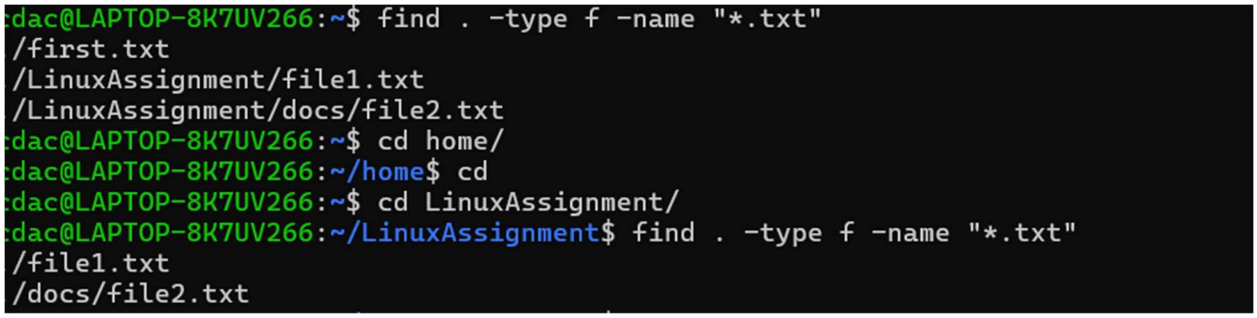
cdac@LAPTOP-8K7UV266:~$ find . -type f -name "*.txt"
./first.txt
./LinuxAssignment/file1.txt
./LinuxAssignment/docs/file2.txt

Method2:

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ find . -type f -name "*.txt"
./file1.txt
./docs/file2.txt

Method 3:

cdac@LAPTOP-8K7UV266:~$ find LinuxAssignment/ -type f -name "*.txt"
LinuxAssignment/file1.txt
LinuxAssignment/docs/file2.txt



```
cdac@LAPTOP-8K7UV266:~$ find LinuxAssignment/  -type f -name "*.txt"
LinuxAssignment/file1.txt
LinuxAssignment/docs/file2.txt
```

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

Answer: "grep" command is used for displaying the lines containing the given word. Here mountain is the required word.

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ nano example.txt

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ grep 'mountain' example.txt

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ nano example.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ grep  'mountain' example.txt
mountains are great place to visit
specially during rains mountains are mesmerizing.
treak on a mountain is a delight for many moutain lowers.
mountain ecosystem in itself is amazing.
```

h) System Information:

a. Display the current system date and time.

Answer:

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ date '+%A %W %Y %X'

Wednesday 35 2024 21:59:54

i) Networking:

a. Display the IP address of the system.

Answer: "hostname" and "ifconifg" are the commands used for displaying ip address and network inter face

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ hostname -I

172.21.128.210

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ hostname -I
172.21.128.210
```

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ip addr

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group de
fault 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:06:4c:7e brd ff:ff:ff:ff:ff:ff
    inet 172.21.128.210/20 brd 172.21.143.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fe06:4c7e/64 scope link
       valid_lft forever preferred_lft forever
```

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ifconfig

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 172.21.128.210  netmask 255.255.240.0  broadcast 172.21.143.255
        inet6 fe80::215:5dff:fe06:4c7e  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:06:4c:7e  txqueuelen 1000  (Ethernet)
        RX packets 67537  bytes 224607579 (224.6 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 29190  bytes 2344522 (2.3 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 150  bytes 16920 (16.9 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 150  bytes 16920 (16.9 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ifconfig -s

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ifconfig -s
Iface      MTU    RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR F
lg
eth0      1500    67537      0      0 0         29190      0      0      0 B
MRU
lo       65536      150      0      0 0           150      0      0      0 L
RU
```

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

j) File Compression:

a. Compress the "docs" directory into a zip file.
Answer:
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ zip -r docs.zip docs
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs docs.zip example.txt file1.txt

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ zip -r docs.zip docs
  adding: docs/ (stored 0%)
  adding: docs/file2.txt (deflated 27%)
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs  docs.zip  example.txt  file1.txt
```

b. Extract the contents of the zip file into a new directory.
Answer:
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ mkdir temp_doc

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs docs.zip example.txt file1.txt temp_doc
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ unzip docs.zip -d temp_doc
Archive: docs.zip
   creating: temp_doc/docs/
  inflating: temp_doc/docs/file2.txt

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ mkdir temp_doc
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs  docs.zip  example.txt  file1.txt  temp_doc
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ unzip docs.zip -d temp_doc
Archive:  docs.zip
   creating: temp_doc/docs/
  inflating: temp_doc/docs/file2.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ ls
docs  docs.zip  example.txt  file1.txt  temp_doc
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cd temp_doc/
cdac@LAPTOP-8K7UV266:~/LinuxAssignment/temp_doc$ ls
docs
```

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).

Answer: here the word 'mountain' in example.txt is exchanged with word 'hill'

cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ sed -i 's/mountain/hill/g' example.txt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cat example.txt

```
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ sed -i 's/mountain/hill/g' example.t
xt
cdac@LAPTOP-8K7UV266:~/LinuxAssignment$ cat example.txt
hills are great place to visit
specially during rains hills are mesmerizing.
treak on a hill is a delight for many moutain lowers.
```

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.

Answer: head data.txt

head command on default displays first 10 lines of the file.

```
cdac@LAPTOP-8K7UV266:~/home$ head data.txt
sheep1
sheep2
sheep3
sheep4
sheep5
sheep6
sheep7
sheep8
sheep9
sheep10
```

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

Answer: tail -5 data.txt

tial command on default displays last 10 lines of the file. We can

Specify number of line we desire to print as given above.

```
cdac@LAPTOP-8K7UV266:~/home$ tail -5 data.txt
sheep17
sheep18
sheep19
sheep19
sheep20
```

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.

Answer: head -15 numbers.txt

```
cdac@LAPTOP-8K7UV266:~/home$ head -15 data.txt
sheep1
sheep2
sheep3
sheep4
sheep5
sheep6
sheep7
sheep8
sheep9
sheep10
sheep11
sheep12
sheep13
sheep14
sheep15
```

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

Answer: tail -3 numbers.txt

```
cdac@LAPTOP-8K7UV266:~/home$ tail -3 numbers.txt
eignt VIII
nine IX
ten X
```

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."

Answer:tr a-z A-Z < input.txt >> output.txt

```
cdac@LAPTOP-8K7UV266:~/home$ cat input.txt
House
Door
Window
Carpet
Roof
cdac@LAPTOP-8K7UV266:~/home$ tr a-z A-Z < input.txt >>output.txt
cdac@LAPTOP-8K7UV266:~/home$ ls
data.txt  input.txt  numbers.txt  output.txt
cdac@LAPTOP-8K7UV266:~/home$ cat output.txt
HOUSE
DOOR
WINDOW
CARPET
ROOF
```

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."

Answer: uniq duplicate.txt

```
cdac@LAPTOP-8K7UV266:~/home$ cat duplicate.txt
Here in the village of Nakuroim it snows for 6 months.
The sun appears for 4 months in a year.
The village is surrounded by mountains.
The village is surrounded by mountains.
cdac@LAPTOP-8K7UV266:~/home$ uniq duplicate.txt
Here in the village of Nakuroim it snows for 6 months.
The sun appears for 4 months in a year.
The village is surrounded by mountains.
cdac@LAPTOP-8K7UV266:~/home$
```

Type 2:

If the duplicate lines aren't adjacent.

```
cdac@LAPTOP-8K7UV266:~/home$ cat duplicate.txt
Here in the village of Nakuroim it snows for 6 months.
The sun appears for 4 months in a year.
The village is surrounded by mountains.
This village has many amazing natural wonders.
The village is surrounded by mountains.
```

```
cdac@LAPTOP-8K7UV266:~/home$ sort duplicate.txt |uniq
Here in the village of Nakuroim it snows for 6 months.
The sun appears for 4 months in a year.
The village is surrounded by mountains.
This village has many amazing natural wonders.
```

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."

Answer: sort fruit.txt | uniq -c