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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.

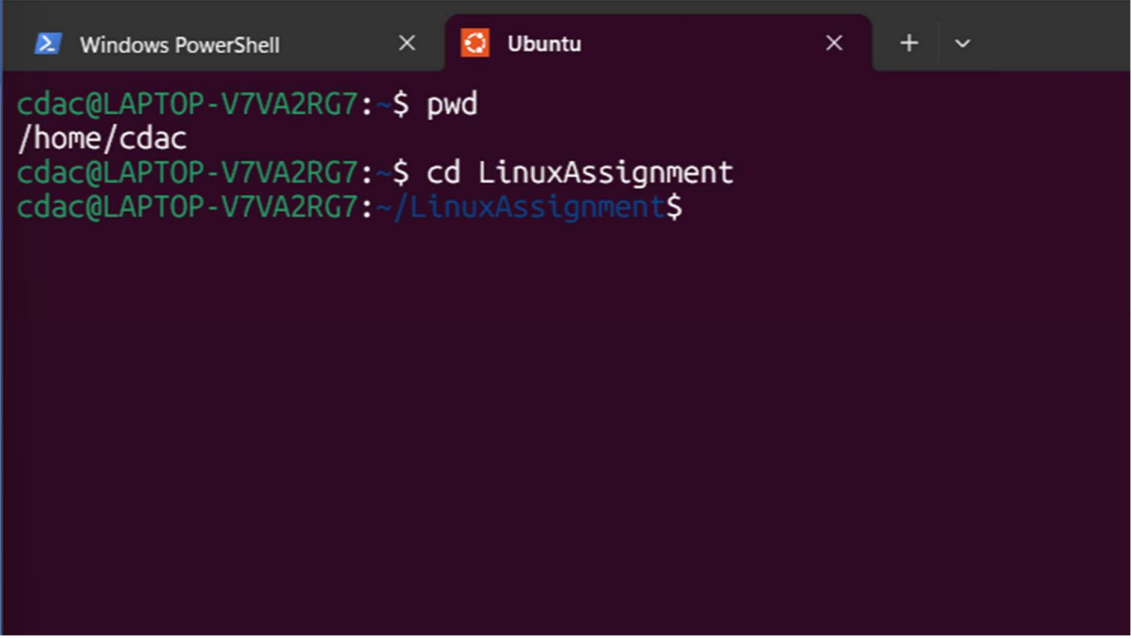
a) Navigate and List: a. Start by navigating to your home directory and list its contents. Then, move into a directory named "LinuxAssignment" if it exists; otherwise, create it.

Answer

To create a new directory "mkdir" command is used followed by file name

E.g. "mkdir LinuxAssignment"

To move into to the directory "cd" command is used E.g. "cd LinuxAssignment".

A screenshot of a terminal window with two tabs: 'Windows PowerShell' and 'Ubuntu'. The 'Ubuntu' tab is active, showing a terminal session for user 'cdac' on machine 'LAPTOP-V7VA2RG7'. The prompt is '~\$'. The user enters 'pwd', and the output is '/home/cdac'. The user then enters 'cd LinuxAssignment', and the output is '~/LinuxAssignment\$'.

```
Windows PowerShell x Ubuntu x + v
cdac@LAPTOP-V7VA2RG7:~$ pwd
/home/cdac
cdac@LAPTOP-V7VA2RG7:~$ cd LinuxAssignment
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$
```

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

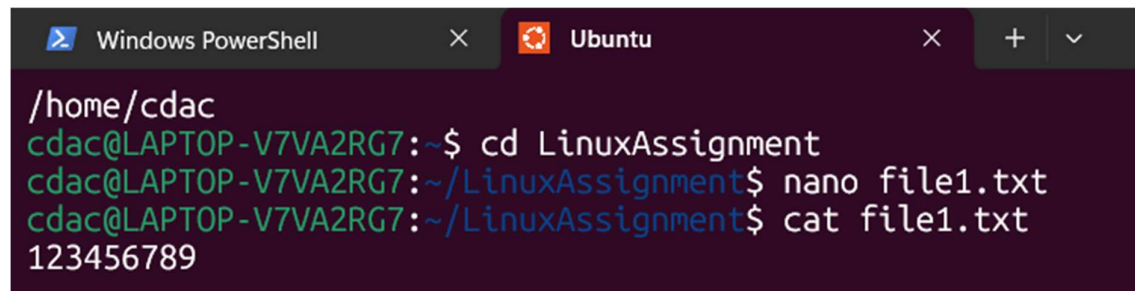
Answer

to create any file in linux the "nano" editor is used

Eg "nano file1.txt"

And to display its content "cat" command is used

Eg "cat file1.txt"

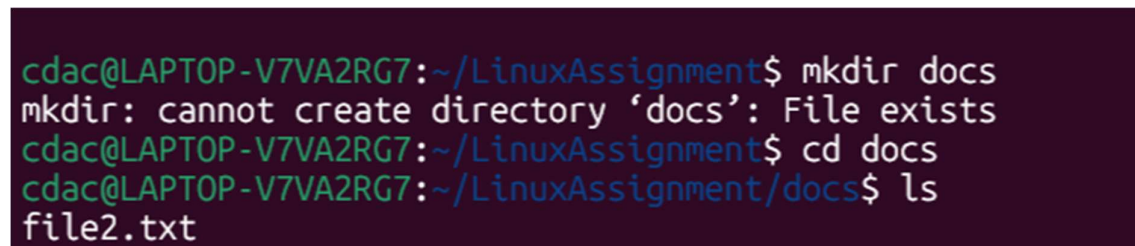
A terminal window with two tabs: "Windows PowerShell" and "Ubuntu". The active tab is "Ubuntu". The terminal shows the following commands and output:

```
/home/cdac
cdac@LAPTOP-V7VA2RG7:~$ cd LinuxAssignment
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ nano file1.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cat file1.txt
123456789
```

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

Answer

to create a new directory under the "LinuxAssignment" directory first directory is changed with "cd LinuxAssignment" command and using "mkdir docs" command a new directory named docs is created.

A terminal window showing the following commands and output:

```
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ mkdir docs
mkdir: cannot create directory 'docs': File exists
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cd docs
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls
file2.txt
```

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

Answer

to copy the file "file1.txt" first directory is changed to LinuxAssignment where file is located and with "cp file1.txt docs" the file is copied into "docs" directory

and to change the name of file the "mv file1.txt file2.txt" command is used.

```
Windows PowerShell  X  Ubuntu  X  +  v
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ ls
docs  file1.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cp file1.txt docs
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cd docs
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls
LinuxAssignment  file1.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ mv file1.txt file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls
LinuxAssignment  file2.txt
cdac@LAPTOP-V7VA2RG7:~/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

Answer

To change the permission of the file2.txt "chmod 744 file2.txt" command was used to allow primary user to allow read,write and execute .and "sudo chown \$(whoami) file2.txt" was used to change the owner of the file.

```
Windows PowerShell  X  Ubuntu  X  +  v
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls
LinuxAssignment  file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls -l file2.txt
-rw-r--r-- 1 cdac cdac 11 Feb 27 14:48 file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ chmod 744 file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 11 Feb 27 14:48 file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ sudo chown $(whoami) file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls -l file2.txt
-rwxr--r-- 1 cdac cdac 11 Feb 27 14:48 file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ sudo chown $(whoami) 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.

Answer

```
Ubuntu
cdac@LAPTOP-V7VA2RG7:~/COS$ cd ..
cdac@LAPTOP-V7VA2RG7:~$ ls
COS LinuxAssignment akshay doc
cdac@LAPTOP-V7VA2RG7:~$ cd LinuxAssignment
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ ls
docs file1.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cd docs
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ ls
LinuxAssignment file2.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ cat file2
cat: file2: No such file or directory
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/docs$ cat file2.txt
123456789

cdac@LAPTOP-V7VA2RG7:~/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)

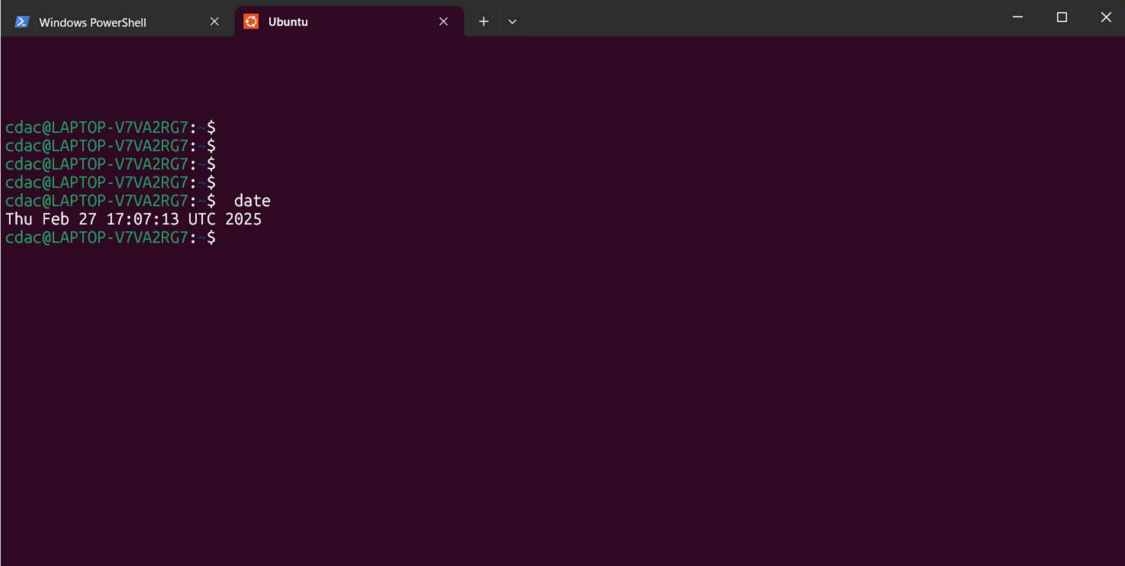
Answer

```
Ubuntu
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ find . -name "*.txt"
./docs/file2.txt
./docs/high.txt
./cdac.txt
./file1.txt
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ grep -i "yes" cdac.txt
say yes to making memories
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$
```

h) System Information:

a. Display the current system date and time.

Answer



The image shows a terminal window with two tabs: 'Windows PowerShell' and 'Ubuntu'. The 'Ubuntu' tab is active, displaying a dark purple background with green text. The prompt is 'cdac@LAPTOP-V7VA2RG7: \$'. The command 'date' has been entered, and the output is 'Thu Feb 27 17:07:13 UTC 2025'.

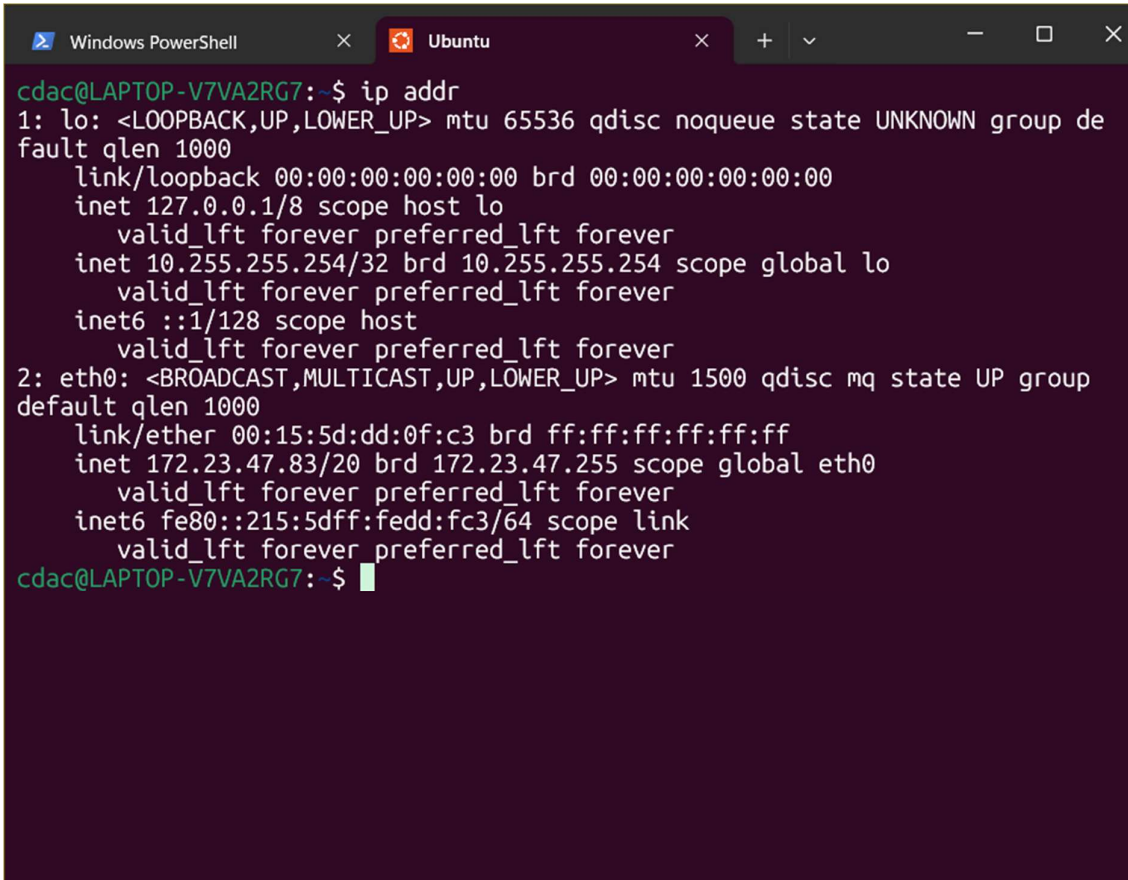
```
cdac@LAPTOP-V7VA2RG7: $  
cdac@LAPTOP-V7VA2RG7: $  
cdac@LAPTOP-V7VA2RG7: $  
cdac@LAPTOP-V7VA2RG7: $  
cdac@LAPTOP-V7VA2RG7: $ date  
Thu Feb 27 17:07:13 UTC 2025  
cdac@LAPTOP-V7VA2RG7: $
```

i) Networking:

a. Display the IP address of the system.

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

Answer



```
cdac@LAPTOP-V7VA2RG7:~$ 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:dd:0f:c3 brd ff:ff:ff:ff:ff:ff
    inet 172.23.47.83/20 brd 172.23.47.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::215:5dff:fedd:fc3/64 scope link
        valid_lft forever preferred_lft forever
cdac@LAPTOP-V7VA2RG7:~$
```

```
Windows PowerShell  Ubuntu  Ubuntu
cdac@LAPTOP-V7VA2RG7: $ ping 169.254.109.243
PING 169.254.109.243 (169.254.109.243) 56(84) bytes of data.
```

j) File Compression:

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

Answer

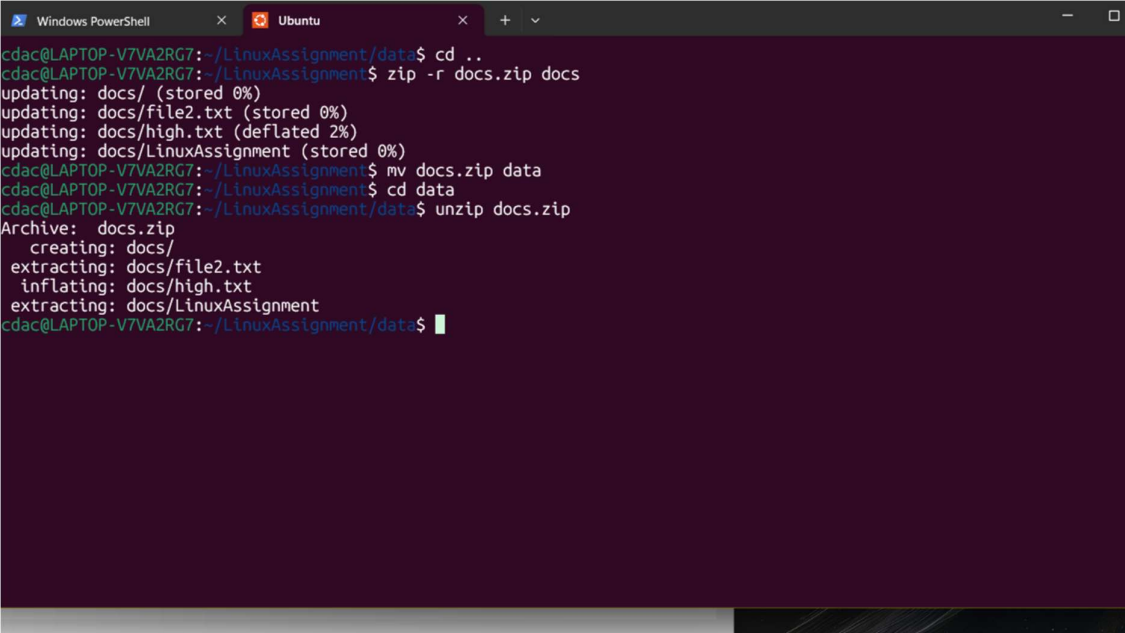
```
Windows PowerShell  Ubuntu
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/data$ cd ..
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ zip -r docs.zip docs
updating: docs/ (stored 0%)
updating: docs/file2.txt (stored 0%)
updating: docs/high.txt (deflated 2%)
updating: docs/LinuxAssignment (stored 0%)
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ mv docs.zip data
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cd data
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/data$ unzip docs.zip
Archive: docs.zip
  creating: docs/
  extracting: docs/file2.txt
  inflating: docs/high.txt
  extracting: docs/LinuxAssignment
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/data$
```

k) File Editing:

- 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



```
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/data$ cd ..
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ zip -r docs.zip docs
updating: docs/ (stored 0%)
updating: docs/file2.txt (stored 0%)
updating: docs/high.txt (deflated 2%)
updating: docs/LinuxAssignment (stored 0%)
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ mv docs.zip data
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment$ cd data
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/data$ unzip docs.zip
Archive: docs.zip
  creating: docs/
  extracting: docs/file2.txt
  inflating: docs/high.txt
  extracting: docs/LinuxAssignment
cdac@LAPTOP-V7VA2RG7:~/LinuxAssignment/data$
```

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

To get the data " Bash head -n 10 data.txt" will be used

- 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

To get the data " Bash head -n 5 data.txt" will be used

- c. In a file named "numbers.txt," there are a series of numbers. Display the first 15 lines of this file to analyse the initial data set

Answer

To get the data " Bash head -n 15 data.txt" will be used

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

Answer

Bash tail -n 3 numbers.txt

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

Bash tr '[:lower:]' '[:upper:]' input.txt output.txt

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

Bash sort duplicate.txt | uniq

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

Bash sort fruit.txt | uniq -c