

**NETWORKING & SYSTEM
ADMINISTRATION LAB-20MCA136**

RECORD

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Basic Linux Commands with examples.

Contents:

1. pwd
2. history
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5. cd
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7. rmdir
8. touch
9. rm
- 10.cat

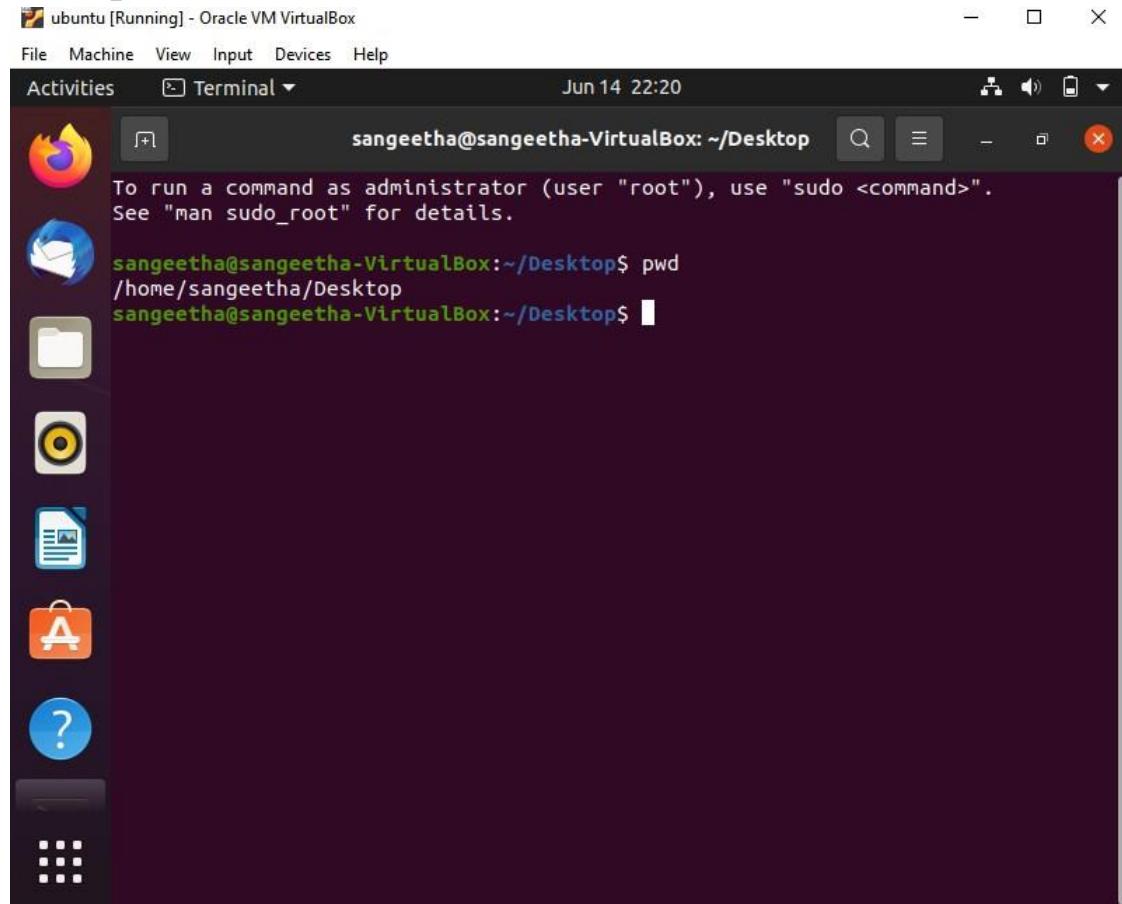
1. pwd:

linux pwd(print working directory) command displays your location currently you are working on .It will gives the whole path starting from the root ending to **the directory**.

Syntax:

\$pwd

Example:



The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Terminal" and the prompt is "sangeetha@sangeetha-VirtualBox: ~/Desktop". The terminal displays the following text:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
sangeetha@sangeetha-VirtualBox:~/Desktop\$ pwd
/home/sangeetha/Desktop
sangeetha@sangeetha-VirtualBox:~/Desktop\$

2.history:

History command is used to view the previously executed command . When you have been using Linux for a certain period of time, you will quickly notice that you can run hundreds of commands every day. As such, running history command is particularly useful if you want to review the commands you have entered before.

Syntax:

```
$ history
```

Example:

```
26 ls -a
27 ls -t
28 clear
29 history
30 clear
31 man ls
32 history
33 history ls -t -t
34 clear
35 history
36 history history
37 man ls
38 ls
39 clear
40 man ls
41 pwd
42 cd
43 cd nwlab
44 nw
45 cd nw
46 cd lab
47 cd nw
48 cd nwlab
49 cd lab
50 clear
51 pwd
52 ls
53 history
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

Display the nth commands from the history:

We can display the specific number of commands by specifying it as

"!<command number>". For example, we want to show the most recent

command which is 500th in our history file, execute the command as follows:

Syntax:

! Command number

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ history
1  pwd
2  clear
3  history
4  pwd
5  ld
6  ls
7  man
8  man pwd
9  clear
10 cd nwlab
11 mkdir nw lab
12 pwd
13 ls -r
14 ls -r
15 ls -a
16 ls -t
17 clear
18 history
19 clear
20 man ls
21 history
22 history ls -t -t
23 clear
24 history
sangeetha@sangeetha-VirtualBox:~/Desktop$ history !3
history history
bash: history: history: numeric argument required
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

3.man:

Confused about the function of certain Linux commands? Don“t worry, you

can easily learn how to use them right from Linux“s shell by using the man

command. For instance, entering man tail will show the manual instruction of the tail command.

- Use the command: man man to start learning about man utility.

Syntax :

\$man COMMAND NAME

Example:

```
2 clear
3 history
4 pwd
5 ld
6 ls
7 man
8 man pwd
9 clear
10 cd nwlab
11 mkdir nw lab
12 pwd
13 ls-r
14 ls -r
15 ls -a
16 ls -t
17 clear
18 history
19 clear
20 man ls
21 history
22 history ls -t -t
23 clear
24 history
sangeetha@sangeetha-VirtualBox:~/Desktop$ history !3
history history
bash: history: history: numeric argument required
sangeetha@sangeetha-VirtualBox:~/Desktop$ man ls
sangeetha@sangeetha-VirtualBox:~/Desktop$ █
```

```
LS(1)                               User Commands      LS(1)

NAME
  ls - list directory contents

SYNOPSIS
  ls [OPTION]... [FILE]...

DESCRIPTION
  List information about the FILEs (the current directory by default).
  Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

  Mandatory arguments to long options are mandatory for short options too.

  -a, --all
    do not ignore entries starting with .

  -A, --almost-all
    do not list implied . and ..

  --author
    with -l, print the author of each file

  -b, --escape
    print C-style escapes for nongraphic characters

Manual page ls(1) line 1 (press h for help or q to quit)
```

4. ls:

The ls command is used to view the contents of a directory. By default, this command will display the contents of your current working directory

- If you want to see the content of other directories, type ls and then the directory's path. For example, enter ls /home/username/Documents to view the content of Documents.
- There are variations you can use with the ls command:
- ls -R will list all the files in the sub-directories as well
- ls -l – long listing
- ls -a will show the hidden files

- ls -al will list the files and directories with detailed information like the permissions, size, owner, etc.
- ls -t lists files sorted in the order of “last modified”
- ls -r option will reverse the natural sorting order. Usually used in combination with other switches such as ls -tr. This will reverse the time-wise listing.

Syntax:

```
$ ls
```

Example:

```
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.
```

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ man ls  
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls  
lab  ls  nw  
sangeetha@sangeetha-VirtualBox:~/Desktop$ █
```

Other ls commands syntax:

```
$ ls-R
```

```
$ ls-I
```

```
$ls-a
```

```
$ ls -al
```

```
$ ls -t
```

```
$ ls -r
```

```
$ ls -tr
```

Examples:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ man ls
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls
lab  ls  nw
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -R
.:
lab  ls  nw

./lab:

./nw:
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls I
ls: cannot access 'I': No such file or directory
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -a
. .. lab  ls  nw
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -al
total 20
drwxr-xr-x  4 sangeetha sangeetha 4096 Jun 14 22:23 .
drwxr-xr-x 14 sangeetha sangeetha 4096 Jun 14 21:05 ..
drwxrwxr-x  2 sangeetha sangeetha 4096 Jun 14 22:23 lab
-rw-r--r--  1 sangeetha sangeetha 1744 Jun 14 22:22 ls
drwxrwxr-x  2 sangeetha sangeetha 4096 Jun 14 22:23 nw
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -t
lab  nw  ls
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -r
nw  ls  lab
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -tr
ls  nw  lab
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

5. cd:

To navigate through the Linux files and directories, use the cd .

- It requires either the full path or the name of the directory, depending on the current working directory that you’re in.
- Let’s say you’re in /home/username/Documents and you want to go to Photos, a subdirectory of Documents. To do so, simply type the following command: cd Photos.
- Another scenario is if you want to switch to a completely new directory, for example,/home/username/Movies. In this case, you have to type cd followed by the directory’s absolute path: cd /home/username/Movies.
- Shortcuts to help you navigate quickly:
 - cd .. (with two dots) to move one directory up
 - cd to go straight to the home folder
 - cd- (with a hyphen) to move to your previous directory Note: Linux’s shell is case sensitive. So, you have to type the name’s directory exactly as it is

Syntax:

\$cd directory name

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ pwd  
/home/sangeetha/Desktop  
sangeetha@sangeetha-VirtualBox:~/Desktop$ cd lab  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ cd ..  
sangeetha@sangeetha-VirtualBox:~/Desktop$ cd -  
/home/sangeetha/Desktop/lab  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ █
```

6.mkdir

- mkdir command in Linux allows the user to create directories (also referred to as folders in some operating systems)
- . This command can create multiple directories at once as well as set the permissions for the directories.
- It is important to note that the user must have enough permissions to create a directory in the parent directory, or he/she may receive a „permission denied“ error. Syntax: \$ mkdir directory name Example: command in Linux allows the user to create directories (also referred to as folders in some operating systems).
- This command can create multiple directories at once as well as set the permissions for the directories. It is important to note that the user executing this command must have enough permissions to create a directory in the parent

Syntax:

\$ mkdir directory name

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ pwd  
/home/sangeetha/Desktop  
sangeetha@sangeetha-VirtualBox:~/Desktop$ cd lab  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ cd ..  
sangeetha@sangeetha-VirtualBox:~/Desktop$ cd -  
/home/sangeetha/Desktop/lab  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ mkdir labworks  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ ls  
labworks  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$
```

- Use the p option to create a directory in between two existing directories.

Syntax:

Mkdir –p directoryname1/directoryname2

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ cd -  
/home/sangeetha/Desktop/lab  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ mkdir labworks  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ ls  
labworks  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ mkdir -p sample/sample1  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ ls  
labworks sample  
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$
```

7. rmdir

To remove a directory, use the rmdir command. However, rmdir only allows you to delete empty directories.

Syntax:

Rmdir directory name/

Examples:

```
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ rmdir sample/
rmdir: failed to remove 'sample/': Directory not empty
sangeetha@sangeetha-VirtualBox:~/Desktop/lab$ █
```

8.touch:

Touch command is used to create a blank new file in linux.

Syntax:

```
$ touch filename
```

Examples:

```
sangeetha@sangeetha-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
sangeetha@sangeetha-VirtualBox:~$ touch file1 file2 file3
sangeetha@sangeetha-VirtualBox:~$ ls
Desktop Downloads file2 Music Public Videos
Documents file1 file3 Pictures Templates
sangeetha@sangeetha-VirtualBox:~$ █
```

9.rm:

rm command is used to remove or delete directories and the contents within them.

Syntax:

```
rm filename
```

Examples:

```
sangeetha@sangeetha-VirtualBox:~$ ls
Desktop  Downloads  file2  Music      Public      Videos
Documents  file1    file3  Pictures   Templates
sangeetha@sangeetha-VirtualBox:~$ rm file1
sangeetha@sangeetha-VirtualBox:~$ ls
Desktop  Downloads  file3  Pictures   Templates
Documents  file2    Music  Public      Videos
sangeetha@sangeetha-VirtualBox:~$
```

10.cat:

The „cat“ command is the most universal and powerful tool.it is considered to be one of the most frequently used commands. It can be used to display the content of a file , copy content from one file to another, concatenate the contents of multiple files ,display the line numbers,display \$ at the end of the line,etc.

Syntax:

cat filename

Examples:

```
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ ls
file1 file2 file3 file4 mycommands mycommands.txt new newfile
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat >mycommands
hello.....Friends!
^C
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ mycommands
mycommands: command not found
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat mycommands
hello.....Friends!
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$
```

.cat command also join two files and stores the result in another new file.

Syntax:

cat filename1 filename2 >filename3

```
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ touch file1
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ ls
file1 mycommands mycommands.txt new newfile
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ touch file2
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ touch file3
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ ls
file1 file2 file3 mycommands mycommands.txt new newfile
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat >file1
first file....
^C
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat >file2
second file....
^C
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat >file3
third file
^C
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ touch file4
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ ls
file1 file2 file3 file4 mycommands mycommands.txt new newfile
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat file1 file2 file3 >file4
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$ cat file4
first file....
second file....
third file
sangeetha@sangeetha-VirtualBox:~/Desktop/nwlab$
```

To append the content of a file:

The „cat“ command with double greater than sign (>>) append (add something in the last of a file) something in your already existing file.

the cat command is also used to convert a file to upper case or lower case

Syntax:

cat >> (file name)

cat filename | tr a-z A-Z>output.txt

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls
file1 file2 file3 file4 file5 lab ls nw nwlab
sangeetha@sangeetha-VirtualBox:~/Desktop$ cat file4
first file
second file
third file
sangeetha@sangeetha-VirtualBox:~/Desktop$ cat file4 | tr a-z A-Z >file5
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls
file1 file2 file3 file4 file5 lab ls nw nwlab
sangeetha@sangeetha-VirtualBox:~/Desktop$ cat file5
FIRST FILE
SECOND FILE
THIRD FILE
sangeetha@sangeetha-VirtualBox:~/Desktop$ █
```

Basic Linux Commands

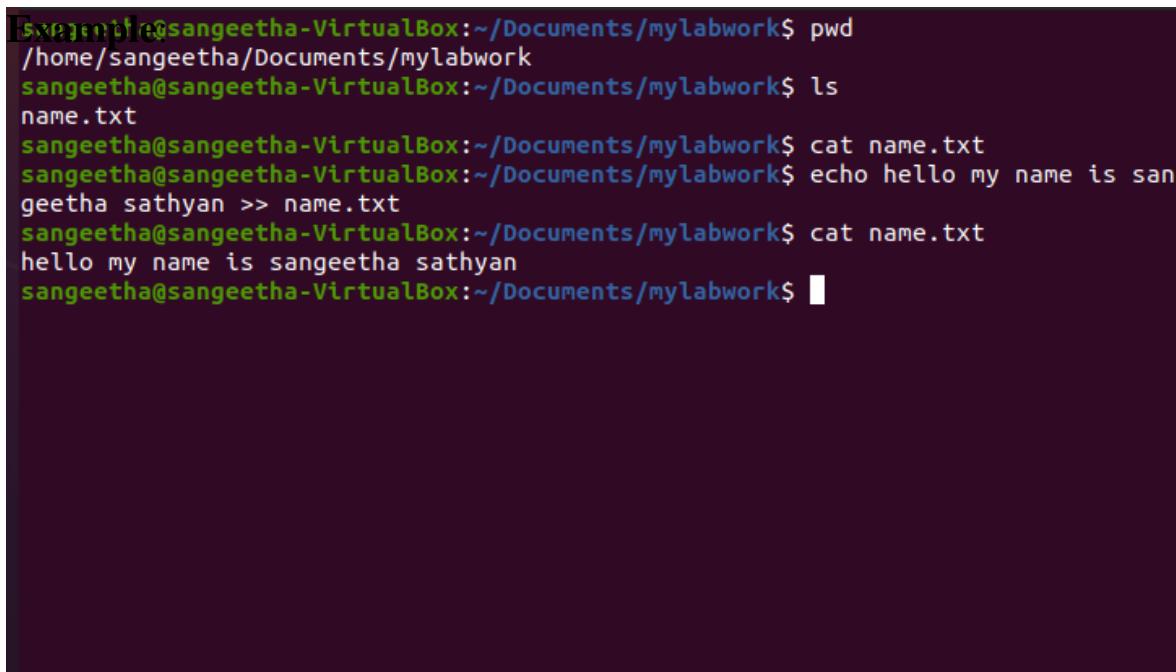
- Echo
- Head
- Tail
- read
- more
- less
- cut
- paste
- uname
- cp
- mv
- locate
- find
- grep
- df
- du
- useradd
- userdel
- sudo
- passwd

1.echo:

- echo command is used to move some data into a file.
- **echo** command in linux is used to display line of text/string that are passed as an argument .
- This is a built in command that is mostly used in shell scripts and batch files to output status text to the screen or a file.
- If you want to add the text, “hello my name is sangeetha sathyan” into a file called name.txt, you would type echo Hello, my name is sangeetha sathyan >> name.txt.

Syntax:

\$ echo [option] [string]



```
sangeetha@Sangeetha-VirtualBox:~/Documents/mylabwork$ pwd  
/home/sangeetha/Documents/mylabwork  
sangeetha@Sangeetha-VirtualBox:~/Documents/mylabwork$ ls  
name.txt  
sangeetha@Sangeetha-VirtualBox:~/Documents/mylabwork$ cat name.txt  
sangeetha@Sangeetha-VirtualBox:~/Documents/mylabwork$ echo hello my name is san  
geetha sathyan >> name.txt  
sangeetha@Sangeetha-VirtualBox:~/Documents/mylabwork$ cat name.txt  
hello my name is sangeetha sathyan  
sangeetha@Sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

2.head:

- The head command is used to view the first lines of any text file.

- By default, it will show the first ten lines, but you can change this number to your liking.

- If more than one file name is provided then data from each file is preceded by its file name.
- If you only want to show the first five lines, type head -n 5 name.txt

Syntax:

head –n filename

Example:

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cat head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Apple >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Orange >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Banana >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo grapes >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Bluebeery >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Apricot >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Pineapple >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo pappaya >> head.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cat head.txt
Apple
Orange
Banana
grapes
Bluebeery
Apricot
Pineapple
pappaya
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ head -n 5 head.txt
Apple
Orange
Banana
grapes
Bluebeery
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

3.tail:

This one has a similar function to the head command, but instead of showing the first lines, the tail command will display the last ten lines of a text file.

Syntax:

```
tail -n filename.txt
```

Example:

```
Orange  
Banana  
grapes  
Bluebeery  
Apricot  
Pineapple  
pappaya  
strawberry  
mango  
watermelon
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tail head.txt
```

```
Orange  
Banana  
grapes  
Bluebeery  
Apricot  
Pineapple  
pappaya  
strawberry  
mango  
watermelon
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tail -n 3 head.txt
```

```
strawberry  
mango  
watermelon
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

4.read:

- read the contents of a line into a variable.
- The read command can be used with and without arguments
- read command is used to read [options] [name...]

syntax:

```
$read
```

```
$read var1 var2 var3
```

```
$echo "[\$var1] [\$var2] [\$var3]"
```

Example:

```
sangeeta@sangeetha-VirtualBox:~/Documents/mylabwork$ read
hello i'm sangeetha sathyan...
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo $REPLY
hello i'm sangeetha sathyan...
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ 
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ read var1 var2 var3
the read command is used to read the contents of a line into a variables
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo "[${var1}] [${var2}] [${var3}]"
[the] [read] [command is used to read the contents of a line into a variables]
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ 
```

5.more:

- Like cat command, more command displays the content of a file.
- Only difference is that, in case of larger files, 'cat' command output will scroll off your screen while 'more' command displays output one screenful at a time.
- Enter key: To scroll down page line by line.
- Space bar: To go to next page.
- b key: To go to the backward page.
- / key: Lets you search the string.
- more -num :Limits the line displayed per page.
- more -d :Displays user message at right corner
- more -s: Squeeze blank lines
- more +/string name: It helps to find the string.
- more +num :Used to display the content from a specific line.

Syntax:

\$more
\$ more /etc/passwd

```

more: stat of [-d] failed: No such file or directory
more: stat of [-4] failed: No such file or directory
more: stat of [+reset] failed: No such file or directory
more: stat of [+5] failed: No such file or directory
more: stat of [more.txt] failed: No such file or directory
[sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ more [-d] [-4] [+/reset]
[+5] [more.txt]

root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:103:106:/nonexistent:/usr/sbin/nologin
syslog:x:104:110::/home/syslog:/usr/sbin/nologin
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false
--More--(48%)

```

6.less :

- The 'less' command is same as 'more' command but include some more features.
- It automatically adjust with the width and height of the teminal window, while 'more' command cuts the content as the width of the terminal window get shorter.

Syntax :

\$ less
\$less /etc/passwd

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ less more.txt  
Example:
```

more command is used to view the text to view the files in the command prompt.d isplaying one screen at a time in case the file is large.the more command also folloes the user do scroll up and down through thepage .the syntax along with o ptuon and command after a pipe
more.txt (END)

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ less /etc/passwd
```

```
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:103:106::/nonexistent:/usr/sbin/nologin
syslog:x:104:110::/home/syslog:/usr/sbin/nologin
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false
```

7.cut :

The cut command is used for cutting out the sections from each line of files and writing the result to standard output. It can be used to cut parts of a line by byte position, character and field

Syntax:

```
$ cut OPTION... [FILE]...
```

```
$cut -b 1,2,3 head.txt
```

Example:

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cat head.txt
Apple
Orange
Banana
grapes
Bluebeery
Apricot
Pineapple
pappaya
strawberry
mango
watermelon
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cut head.txt
cut: you must specify a list of bytes, characters, or fields
Try 'cut --help' for more information.
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cut -b 1,2,3 head.txt
App
Ora
Ban
gra
Blu
Apr
Pin
pap
str
man
wat
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
```

8.paste:

It is used to join files horizontally (parallel merging) by outputting lines consisting of lines from each file specified, separated by tab as delimiter, to the standard output.

Syntax :

```
$ paste [OPTION]... [FILES]...
```

```
$ paste file1.txt file2.txt
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ touch file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ touch file2.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls
file1.txt  file2.txt  head.txt  more.txt  name.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Iron man >>file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Thor >>file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Captian America >>file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Hulk >>file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo spiderman >>file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Black widow >>file2.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Captian marvel >>file2.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo Dark PHoenix >>file2.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ echo nebula >>file2.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cat file1.txt
Iron man
Thor
Captian America
Hulk
spiderman
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cat file2.txt
Black widow
Captian marvel
Dark PHoenix
nebula
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ paste file1.txt file2.txt
Iron man      Black widow
Thor      Captian marvel
Captian America Dark PHoenix
Hulk      nebula
spiderman
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
```

9.uname:

The uname command, short for Unix Name, will print detailed information about your Linux system like the machine name, operating system, kernel, and so on.

Syntax:

```
$uname  
$uname -r  
$uname -a  
$uname -s  
$uname -n  
$uname -v  
$uname -m  
$uname -p  
$uname -i  
$uname -o
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname  
Linux  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -r  
5.8.0-55-generic  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -a  
Linux sangeetha-VirtualBox 5.8.0-55-generic #62~20.04.1-Ubuntu SMP Wed Jun 2 08  
:55:04 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -s  
Linux  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -n  
sangeetha-VirtualBox  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -v  
#62~20.04.1-Ubuntu SMP Wed Jun 2 08:55:04 UTC 2021  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -m  
x86_64  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -p  
x86_64  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -i  
x86_64  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ uname -o  
GNU/Linux  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
```

10.cp :

- cp command is used to copy files from the current directory to a different directory.
- cp -i will ask for user's consent in case of a potential file overwrite.
- cp -p will preserve source files' mode, ownership and timestamp.
- cp -r will copy directories recursively.
- cp -u copies files only if the destination file is not existing or the source file is newer than the destination file

syntax:

```
cp src_file dest_file
```

example:

```
sangeetha@sangeetha-VirtualBox:~/Downloads$ ls  
file1 newfile  
sangeetha@sangeetha-VirtualBox:~/Downloads$ cp file1 file2  
sangeetha@sangeetha-VirtualBox:~/Downloads$ ls  
file1 file2 newfile  
sangeetha@sangeetha-VirtualBox:~/Downloads$ pwd  
/home/sangeetha/Downloads  
sangeetha@sangeetha-VirtualBox:~/Downloads$ █
```

If the command has one or more arguments,

Syntax:

```
sangeetha@sangeetha-VirtualBox:~/Downloads$ ls  
file1 file2 new newfile  
sangeetha@sangeetha-VirtualBox:~/Downloads$ ls new  
sangeetha@sangeetha-VirtualBox:~/Downloads$ cp file1 file2 new  
sangeetha@sangeetha-VirtualBox:~/Downloads$ ls new  
file1 file2  
sangeetha@sangeetha-VirtualBox:~/Downloads$ █
```

```
sangeetha@sangeetha-VirtualBox:~/Downloads$ cp -i file1 file2
cp: overwrite 'file2'? y
sangeetha@sangeetha-VirtualBox:~/Downloads$ cat file2
sangeetha@sangeetha-VirtualBox:~/Downloads$ cp -b file1 file2
sangeetha@sangeetha-VirtualBox:~/Downloads$ ls
file1 file2 file2~ new newfile
sangeetha@sangeetha-VirtualBox:~/Downloads$ cp
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file1 file2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cp -i file1 fil
e2
cp: overwrite 'file2'? y
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cat file2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file1 file2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cp -b file1 fil
e2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file1 file2 file2~
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ pwd
/home/sangeetha/Documents/mylabwork/sangeetha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cp sangeetha gfg
g
cp: cannot stat 'sangeetha': No such file or directory
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ mkdir sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file1 file2 file2~ sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cp sangu gfg
cp: -r not specified; omitting directory 'sangu'
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cp -r sangu gfg
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls gfg/
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file1 file2 file2~ gfg sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$
```

11.mv :

The primary use of the mv command is to move files, it can also be used to rename files. The arguments in mv are similar to the cp command. You need to type mv, the file's name, and the destination's directory.

Syntax:

Let us consider 4 files having file1,file2,file3.to rename file ,file1 to linux
\$mv file1 linux

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file1 file2 file2~ gfg sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ mv file1 linux
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file2 file2~ gfg linux sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cat linux
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ echo hai >>linu
x
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cat linux
hai
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ echo hello >>fi
le2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cat file2
hello
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ mv linux file2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ ls
file2 file2~ gfg sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$ cat file2
hai
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork/sangeetha$
```

12.locate:

- To locate a file, just like the search command in Windows.
- What's more, using the -i argument along with this command will make it caseinsensitive, so you can search for a file even if you don't remember its exact name.
- To search for a file that contains two or more words, use an asterisk (*).
- For example, locate -i school*note command will search for any file that contains the word “school” and “note”, whether it is uppercase or lowercase.

Example:

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls
a b file1.txt file2.txt head.txt more.txt name.txt sangeetha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ locate file1
/home/sangeetha/Desktop/file1
/home/sangeetha/Desktop/nwlab/file1
/home/sangeetha/Documents/mylabwork/file1.txt
/home/sangeetha/Downloads/file1
/home/sangeetha/Downloads/new/file1
/usr/share/doc/libsndfile1
/usr/share/doc/libxkbfile1
/usr/share/doc/libsndfile1/changelog.Debian.gz
/usr/share/doc/libsndfile1/copyright
/usr/share/doc/libxkbfile1/changelog.Debian.gz
/usr/share/doc/libxkbfile1/copyright
/var/lib/dpkg/info/libsndfile1:amd64.list
/var/lib/dpkg/info/libsndfile1:amd64.md5sums
/var/lib/dpkg/info/libsndfile1:amd64.shlibs
/var/lib/dpkg/info/libsndfile1:amd64.symbols
/var/lib/dpkg/info/libsndfile1:amd64.triggers
/var/lib/dpkg/info/libxkbfile1:amd64.list
/var/lib/dpkg/info/libxkbfile1:amd64.md5sums
/var/lib/dpkg/info/libxkbfile1:amd64.shlibs
/var/lib/dpkg/info/libxkbfile1:amd64.triggers
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ locate "*.txt" -n 5
/boot/grub/gfxblacklist.txt
/etc/X11/rgb.txt
/etc/brltty/Input/ba/all.txt
/etc/brltty/Input/bd/all.txt
/etc/brltty/Input/bl/18.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ find
.
./more.txt
./a
./sangeetha
./sangeetha/sangu
./sangeetha/file2
./sangeetha/file2~
./sangeetha/gfg
./head.txt
./b
./name.txt
./file2.txt
./file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
```

13.find:

- Similar to the locate command, using find also searches for files and directories.
- The difference is, you use the find command to locate files within a given directory.
- As an example, find /home/ -name notes.txt command will search for a file called notes.txt within the home directory and its subdirectories.

Syntax:

```
find . -name filename
```

To look for directories use / -type d -name filename

Example:

```
sangeetha@sangeetha-VirtualBox:~/Documents/myLabworks$ find
./a
./sangeetha
./sangeetha/sangu
./sangeetha/file2
./sangeetha/file2-
./sangeetha/gfg
./head.txt
./b
./name.txt
./file2.txt
./file1.txt
sangeetha@sangeetha-VirtualBox:~/Documents/myLabworks$ -type d -name head.t
Command '-type' not found, did you mean:
  command 'mtype' from deb mtools (4.0.24-1)
Try: sudo apt install <deb name>
sangeetha@sangeetha-VirtualBox:~/Documents/myLabworks$
```

14.grep:

Another basic Linux command that is undoubtedly helpful for everyday use is grep. It lets you search through all the text in a given file. • To illustrate, grep blue notepad.txt will search for the word blue in the notepad file. Lines that contain the searched word will be displayed fully. Usually output of a previous command is piped into the grep command. For example ls -l | grep “kernel”

Example:

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ grep head.txt  
hai dear..  
  
^C  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls  
a b file1.txt file2.txt head.txt more.txt name.txt sangeetha  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ more.txt  
more.txt: command not found  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ cat more.txt  
more command is used to view the text to view the files in the command prompt.d  
isplaying one screen at a time in case the file is large.the more command also  
olloes the user do scroll up and down through thepage .the syntax along with o  
ption and command after a pipe  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ grep -i "command" more.tx  
t  
more command is used to view the text to view the files in the command prompt.d  
isplaying one screen at a time in case the file is large.the more command also  
olloes the user do scroll up and down through thepage .the syntax along with o  
ption and command after a pipe  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ grep -c "command" more.tx  
t  
1  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ grep -i "command" *  
more.txt:more command is used to view the text to view the files in the command  
prompt.displaying one screen at a time in case the file is large.the more command  
alsoolloes the user do scroll up and down through thepage .the syntax along  
with option and command after a pipe  
grep: sangeetha: Is a directory  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$  
  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ grep -n "command" more.tx  
t  
1:more command is used to view the text to view the files in the command prompt  
.displaying one screen at a time in case the file is large.the more command als  
oolloes the user do scroll up and down through thepage .the syntax along with  
option and command after a pipe  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ grep -v "command" more.tx  
t  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
```

15. df:

- Use df command to get a report on the system's disk space usage, shown in percentage and KBs.

If you want to see the report in megabytes, type df -m.

Example:

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev             664812       0   664812  0% /dev
tmpfs            138988     1324   137664  1% /run
/dev/sda5        19992176  7818432  11135152 42% /
tmpfs            694924       0   694924  0% /dev/shm
tmpfs             5120        4    5116  1% /run/lock
tmpfs            694924       0   694924  0% /sys/fs/cgroup
/dev/loop0        56832     56832       0 100% /snap/core18/2066
/dev/loop1        224256    224256       0 100% /snap/gnome-3-34-1804/72
/dev/loop2        224256    224256       0 100% /snap/gnome-3-34-1804/66
/dev/loop4        66688     66688       0 100% /snap/gtk-common-themes/1515
/dev/loop5        56832     56832       0 100% /snap/core18/1988
/dev/loop3        66432     66432       0 100% /snap/gtk-common-themes/1514
/dev/loop6        31872     31872       0 100% /snap/snapd/11036
/dev/loop8        33152     33152       0 100% /snap/snapd/12159
/dev/loop7        52224     52224       0 100% /snap/snap-store/542
/dev/loop9        52224     52224       0 100% /snap/snap-store/547
/dev/sda1        523248       4   523244  1% /boot/efi
tmpfs            138984      24   138960  1% /run/user/1000
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ df -a
cgroup            0       0       0   - /sys/fs/cgroup/perf_event
cgroup            0       0       0   - /sys/fs/cgroup/net_cls,net_prio
cgroup            0       0       0   - /sys/fs/cgroup/cpu,cpuacct
cgroup            0       0       0   - /sys/fs/cgroup/memory
cgroup            0       0       0   - /sys/fs/cgroup/pids
cgroup            0       0       0   - /sys/fs/cgroup/freezer
cgroup            0       0       0   - /sys/fs/cgroup/devices
systemd-1         -       -       -   - /proc/sys/fs/binfmt_misc
debugfs           0       0       0   - /sys/kernel/debug
mqueue             0       0       0   - /dev/mqueue
hugegetPagefs     0       0       0   - /dev/hugepages
tracefs           0       0       0   - /sys/kernel/tracing
/dev/loop0        56832     56832       0 100% /snap/core18/2066
/dev/loop1        224256    224256       0 100% /snap/gnome-3-34-1804/72
/dev/loop2        224256    224256       0 100% /snap/gnome-3-34-1804/66
/dev/loop4        66688     66688       0 100% /snap/gtk-common-themes/1515
/dev/loop5        56832     56832       0 100% /snap/core18/1988
/dev/loop3        66432     66432       0 100% /snap/gtk-common-themes/1514
configfs          0       0       0   - /sys/kernel/config
/dev/loop6        31872     31872       0 100% /snap/snapd/11036
/dev/loop8        33152     33152       0 100% /snap/snapd/12159
/dev/loop7        52224     52224       0 100% /snap/snap-store/542
fusectl           0       0       0   - /sys/fs/fuse/connections
/dev/loop9        52224     52224       0 100% /snap/snap-store/547
/dev/sda1        523248       4   523244  1% /boot/efi
tmpfs            138984      24   138960  1% /run/user/1000
gvfsd-fuse        0       0       0   - /run/user/1000/gvfs
binfmt_misc       0       0       0   - /proc/sys/fs/binfmt_misc
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ df -m
```

16. du:

- If you want to check how much space a file or a directory takes, the du (Disk Usage) command is the answer. However, the disk usage summary will show disk block numbers instead of the usual size format.
 - If you want to see it in bytes, kilobytes, and megabytes, add the -h argument to the command line.
 - \$du -h

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ du
4      ./sangeetha/sangu
4      ./sangeetha/gfg
16     ./sangeetha
40     .
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ du /sangeetha/sangu
du: cannot access '/sangeetha/sangu': No such file or directory
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ du ./sangeetha/sangu
4      ./sangeetha/sangu
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ du ./sangeetha
4      ./sangeetha/sangu
4      ./sangeetha/gfg
16     ./sangeetha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ du -h ./sangeetha
4.0K   ./sangeetha/sangu
4.0K   ./sangeetha/gfg
16K    ./sangeetha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ du -a -h ./sangeetha
4.0K   ./sangeetha/sangu
4.0K   ./sangeetha/file2
0      ./sangeetha/file2~
4.0K   ./sangeetha/gfg
16K    ./sangeetha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ 
```

Examples:

17. useradd

- This is available only to system admins
- Since Linux is a multi-user system, this means more than one person can interact with the same system at the same time.
- useradd is used to create a new user, while passwd is adding a password to that user's account. To add a new person named John type, useradd John and then to add his password type, passwd 123456789

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo useradd amma
[sudo] password for sangeetha:
Sorry, try again.
[sudo] password for sangeetha:
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo passwd amma
New password:
Retype new password:
passwd: password updated successfully
sangeetha@sangeetha-VirtualBox:~/Desktop$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin/nologin
bin:x:2:2:bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/
```

18. userdel :

- Remove a user is very similar to adding a new user. To delete the users account type, userdel UserName

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo userdel amma
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

19. sudo:

- Short for “SuperUser Do”, this command enables you to perform tasks that require administrative or root permissions. You must have sufficient permissions to use this command.
- sudo useradd amma

Example:

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo useradd amma
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo passwd amma
New password:
Retype new password:
passwd: password updated successfully
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

20.passwd:

- Changes passwords for user accounts.
- A normal user may only change the password for their own account, while the superuser may change the password for any account.

Syntax:

passwd[option] [username]

passwd

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo passwd amma
passwd: user!
New password:
Retype new password:
passwd: password updated successfully
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

Explain linux commands usermod, groupadd, groups,groupmod, groupdel, chmod, chown, id, ps, top with examples

1. usermod

- usermod command is used to change the properties of a user in Linux through the command line
- command-line utility that allows you to modify a user's login information
- #usermod --help
- #usermod -u 2000 student
-

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ usermod --help
Usage: usermod [options] LOGIN

Options:
  -b, --badnames          allow bad names
  -c, --comment COMMENT    new value of the GECOS field
  -d, --home HOME_DIR      new home directory for the user account
  -e, --expiredate EXPIRE_DATE   set account expiration date to EXPIRE_DATE
  -f, --inactive INACTIVE    set password inactive after expiration
                             to INACTIVE
  -g, --gid GROUP          force use GROUP as new primary group
  -G, --groups GROUPS       new list of supplementary GROUPS
  -a, --append               append the user to the supplemental GROUPS
                             mentioned by the -G option without removing
                             the user from other groups
  -h, --help                 display this help message and exit
  -l, --login NEW_LOGIN     new value of the login name
  -L, --lock                  lock the user account
  -m, --move-home            move contents of the home directory to the
                             new location (use only with -d)
  -o, --non-unique           allow using duplicate (non-unique) UID
  -p, --password PASSWORD    use encrypted password for the new password
  -R, --root CHROOT_DIR      directory to chroot into
  -P, --prefix PREFIX_DIR    prefix directory where are located the /etc/* f
iles
  -s, --shell SHELL          new login shell for the user account
  -u, --uid UID              new UID for the user account
  -U, --unlock                unlock the user account
  -v, --add-subuids FIRST-LAST add range of subordinate uids

sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo usermod -u 20000 student
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo usermod -u 20000 student
usermod: no changes
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

2. groupadd

- groupadd command creates a new group account using the values specified on the command line and the default values from the system.
- #groupadd sangeetha10

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupadd sangeetha10
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupadd sangeetha10
groupadd: group 'sangeetha10' already exists
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupadd sangeetha11
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupadd sangeetha12
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupadd sangeetha13
sangeetha@sangeetha-VirtualBox:~/Desktop$ compgen -g sangeetha
sangeetha
sangeetha10
sangeetha11
sangeetha12
sangeetha13
sangeetha@sangeetha-VirtualBox:~/Desktop$ █
```

3. groups - print the groups a user is in

- #groups sangeetha

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ groups sangeetha
sangeetha : sangeetha adm cdrom sudo dip plugdev lpadmin lxd sambashare
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

4.groupdel - groupdel command modifies the system account files, deleting all entries that refer to group. The named group must exist

- #groupdel sangeetha10

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ compgen -g sangeetha
sangeetha
sangeetha10
sangeetha11
sangeetha12
sangeetha13
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupdel sangeetha10
sangeetha@sangeetha-VirtualBox:~/Desktop$ compgen -g sangeetha
sangeetha
sangeetha11
sangeetha12
sangeetha13
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

4. groupmod - The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group database.

```
# groupmod -n group1 group2
```

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ compgen -g sangeetha
sangeetha
sangeetha11
sangeetha12
sangeetha13
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupmod -n new_group sangeetha11
[sudo] password for sangeetha:
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo groupmod -n new_group sangeetha11
groupmod: group 'sangeetha11' does not exist
sangeetha@sangeetha-VirtualBox:~/Desktop$ compgen -g sangeetha
sangeetha
sangeetha12
sangeetha13
sangeetha@sangeetha-VirtualBox:~/Desktop$ compgen -g new_group
new_group
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

5. chmod - To change directory permissions of file/ Directory in Linux.

#chmod whowhatwhich file/directory
• chmod +rwx filename to add permissions.
• chmod -rwx directoryname to remove permissions.
• chmod +x filename to allow executable permissions.
• chmod -wx filename to take out write and executable permissions.

```
#chmod u+x test #chmod g-rwx test #chmod o-r test
```

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ chmod +rwx sangu.txt
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

6. chown - The chown command allows you to change the user and/or group ownership of a given file, directory.

```
#chown vimal vimal.txt
```

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ chown sangeetha sangu.txt
sangeetha@sangeetha-VirtualBox:~/Desktop$ ls -l sangu.txt
sangu.txt
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

7. id - id command in Linux is used to find out user and group names and numeric ID's (UID or group ID) of the current user.

```
#id
```

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ id sangeetha
uid=1000(sangeetha) gid=1000(sangeetha) groups=1000(sangeetha),4(adm),24(cdrom),27(sudo),30(dip),46(pl
ugdev),120(lpadmin),131(lxd),132(sambashare)
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

8. ps - The ps command, short for Process Status, is a command line utility that is used to display or view information related to the processes running in a Linux system.

- PID – This is the unique process ID
- TTY – This is the type of terminal that the user is logged in to
- TIME – This is the time in minutes and seconds that the process has been running
- CMD – The command that launched the process #ps -a

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ ps -a
  PID TTY      TIME CMD
 797 tty2    00:00:29 Xorg
 898 tty2    00:00:00 gnome-session-b
2114 pts/0    00:00:00 sudo
2468 pts/1    00:00:00 ps
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

9. top - top command is used to show the Linux processes.

It provides a dynamic real-time view of the running system

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ top
top - 21:00:34 up 1:58, 1 user, load average: 0.00, 0.00, 0.00
Tasks: 169 total, 1 running, 168 sleeping, 0 stopped, 0 zombie
%Cpu(s): 5.5 us, 0.7 sy, 0.0 ni, 93.8 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 1357.3 total, 79.9 free, 653.8 used, 623.5 buff/cache
MiB Swap: 923.3 total, 905.4 free, 17.9 used, 549.9 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
1047 sangeet+ 20 0 3721812 335176 117220 S 4.0 24.1 1:43.69 gnome-shell
 797 sangeet+ 20 0 541296 65724 41764 S 1.3 4.7 0:30.88 Xorg
2083 sangeet+ 20 0 823356 51116 38316 S 1.0 3.7 0:10.42 gnome-terminal-
 101 root 0 -20 0 0 0 I 0.3 0.0 0:01.51 kworker/0:1H-kblockd
 2476 root 20 0 0 0 0 I 0.3 0.0 0:00.04 kworker/0:1-events
 2479 sangeet+ 20 0 20492 3860 3344 R 0.3 0.3 0:00.09 top
  1 root 20 0 316504 12512 8480 S 0.0 0.9 0:08.50 systemd
  2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthreadd
  3 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_gp
  4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rcu_par_gp
  6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0H-kblockd
  9 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
 10 root 20 0 0 0 0 S 0.0 0.0 0:01.28 ksoftirqd/0
 11 root 20 0 0 0 0 I 0.0 0.0 0:01.69 rCU_sched
 12 root rt 0 0 0 0 S 0.0 0.0 0:00.16 migration/0
 13 root -51 0 0 0 0 S 0.0 0.0 0:00.00 idle_inject/0
 14 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
 15 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kdevtmpfs
 16 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 netns
 17 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rCU_tasks_kthre
 18 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rCU_tasks_rude_
 19 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rCU_tasks_trace
 20 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kauditd
 21 root 20 0 0 0 0 S 0.0 0.0 0:00.00 khungtaskd
 22 root 20 0 0 0 0 S 0.0 0.0 0:00.00 oom_reaper
 23 root 0 -20 0 0 0 T 0.0 0.0 0:00.00 writeback
```

#top -u vimal

Basic Linux Commands: Explain linux commands wc, tar(create, extract using gzip, xz, bzip2), expr, redirections and piping, ssh, ssh-keygen, scp, ssh-copy-id with examples

1. wc

wc stands for word count.

Used for counting purpose.

It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.

```
#wc state.txt  
#wc state.txt capital.txt  
wc -l state.txt  
wc -w state.txt capital.txt  
wc -c state.txt  
wc -m state.txt
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ wc name.txt  
1 6 35 name.txt  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ wc -l name.txt  
1 name.txt  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ wc -c name.txt  
35 name.txt  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ wc -m name.txt  
35 name.txt  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ wc -w name.txt  
6 name.txt  
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

2. tar

The Linux „tar“ stands for tape archive, is used to create Archive and extract the Archive files

Linux tar command to create compressed or uncompressed Archive files

Options:

-c : Creates Archive

-x : Extract the archive

-f : creates archive with given filename

-t : displays or lists files in archived file

-u : archives and adds to an existing archive file

- v : Displays Verbose Information
- A : Concatenates the archive files
- z : zip, tells tar command that creates tar file using gzip
- j : filter archive tar file using tbzip
- W : Verify a archive file
- r : update or add file or directory in already existed .tar file

```
#tar cf archive.tar state.txt capital.txt //create archive file
#ls archive.tar
#tar tf /archive.tar // list contents of tar archive file
• Extract an archive created with tar
#mkdir backup
#cd backup
#tar xf /home/meera/Documents/Meera_Linux/archive.tar
• Compression Types
gzip(z),bzip2(j), xz(J)
#tar czf /abc.tar.gz /etc
#mkdir backup2
#tar cjf /abcd.tar.bz2 /etc
#cd backup2
#tar cJf /abcde.tar.xz /etc
#tar xjf /abcd.tar.bz2
Extract an archive
#mkdir backup3
#mkdir backup1
#cd backup3
#cd backup1
#tar xJf /abcde.tar.xz
#tar xzf /abc.tar.gz
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tar czf archive1.tar.gz s
angeetha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls
a           b           file2.txt  more.txt  sangeetha      sangitha
archive1.tar.gz  file1.txt  head.txt  name.txt  sangeetha.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tar xzf archive1.tar.gz
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls
a           b           file2.txt  more.txt  sangeetha      sangitha
archive1.tar.gz  file1.txt  head.txt  name.txt  sangeetha.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tar cjf arc2.tar.bz2 sang
eetha.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls
a           archive1.tar.gz  file1.txt  head.txt  name.txt  sangeetha.txt
arc2.tar.bz2  b           file2.txt  more.txt  sangeetha  sangitha
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tar xjf arc2.tar.bz2
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ tar cjf arc3.tar.x2 sange
etha.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls
a           archive1.tar.gz  file2.txt  name.txt  sangitha
arc2.tar.bz2  b           head.txt  sangeetha
arc3.tar.x2  file1.txt  more.txt  sangeetha.txt
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

3. expr

The expr command evaluates a given expression and displays its corresponding output. It is used for:

Basic operations like addition, subtraction, multiplication, division, and modulus on integers.

Evaluating regular expressions, string operations like substring, length of strings etc.

Performing operations on variables inside a shell script

```
#expr 10 + 2
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ expr 100 + 5
105
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

4. Redirections & Piping

A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.

Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

```
#ls -l | wc -l
#cat /etc/passwd.txt | head -7 | tail -5
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ls -l|wc -l
14
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ █
```

5. ssh

ssh stands for “Secure Shell”.

It is a protocol used to securely connect to a remote server/system.

ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.

It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

```
#ssh user_name@host(IP/Domain_name)
#ssh -X root@server1.example.com
```

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ssh -X root@server1.sange
etha.txt
ssh: Could not resolve hostname server1.sangeetha.txt: Name or service not known
n
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ssh -X root@server1.sange
```

6.ssh-keygen

ssh-keygen command to generate a public/private authentication

10

key pair. Authentication keys allow a user to connect to a remote system without supplying a password. Keys must be generated for each user separately. If you generate key pairs as the root user, only the root can use the keys.

\$ssh-keygen -t rsa

```
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/sangeetha/.ssh/id_rsa): rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in rsa
Your public key has been saved in rsa.pub
The key fingerprint is:
SHA256:dIQCOsUFgdNYBbCyzd5d9yhHllFINCYSGF3u3jzeus sangeetha@sangeetha-VirtualB
ox
The key's randomart image is:
+---[RSA 3072]---+
| .BXOoo+B..
| ++o..o.=.+
| . +. ... +
| = . . o +
| . o S O
| . . . . = =
| . . . . o o
| o ..
| .oE.
+---[SHA256]---+
sangeetha@sangeetha-VirtualBox:~/Documents/mylabwork$
```

1. Managing Files, Creating Users and Groups Using Command-line tools

a. Create six files with name of the form songX.mp3

b. Create six files with name of the form snapX.jpg

c. Create six files with name of the form filmX.mp4 (In each set, replace X with the numbers 1 through 6)

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ touch song1.mp3 song2.mp3 song3.mp3 song4.mp3
song5.mp3 song6.mp3
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ touch snap1.jpg snap2.jpg snap3.jpg snap4.jpg
snap5.jpg snap6.jpg
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ touch film1.mp4 film2.mp4 film3.mp4 film4.mp4
film5.mp4 film6.mp4
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ ls
film1.mp4 film4.mp4 music snap1.jpg snap4.jpg song1.mp3 song4.mp3 videos
film2.mp4 film5.mp4 picture snap2.jpg snap5.jpg song2.mp3 song5.mp3
film3.mp4 film6.mp4 pictures snap3.jpg snap6.jpg song3.mp3 song6.mp3
```

2. From your home directory, move the song files into your music subdirectory, the snapshot files into your pictures subdirectory, and the movie files into videos subdirectory.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ ls
film1.mp4 film4.mp4 music snap1.jpg snap4.jpg song1.mp3 song4.mp3 videos
film2.mp4 film5.mp4 picture snap2.jpg snap5.jpg song2.mp3 song5.mp3
film3.mp4 film6.mp4 pictures snap3.jpg snap6.jpg song3.mp3 song6.mp3
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ mv *.mp3 ./music/
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ mv *.jpg ./pictures/
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ mv *.mp4 ./videos/
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

3. In your home directory, create three subdirectories for organizing your files. Call these directories friends, family, and work. Create all three with one command.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ mkdir -p {friends,family,work}
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ ls
family friends music picture pictures videos work
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

4. Copy song files to the friends folder and snap files to family folder.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ cp /home/sangeetha/Documents/assignment5/pictures snap1.jpg snap2.jpg snap3.jpg snap4.jpg snap5.jpg snap6.jpg /home/sangeetha/Documents/assignment5/family/
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ cp /home/sangeetha/Documents/assignment5/music song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3 /home/sangeetha/Documents/assignment5/friends/
```

5. Attempt to delete both family and friends projects with a single rmdir command

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ rmdir {friends,family}
```

6. Use another command that will succeed in deleting both the family and friends folder.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignments$ rm -r friends family
sangeetha@sangeetha-VirtualBox:~/Documents/assignments$ ls
film1.mp4  film4.mp4  music      snap1.jpg  snap4.jpg  videos
film2.mp4  film5.mp4  picture    snap2.jpg  snap5.jpg  work
film3.mp4  film6.mp4  pictures   snap3.jpg  snap6.jpg
sangeetha@sangeetha-VirtualBox:~/Documents/assignments$
```

7. Redirect a long listing of all home directory files, including hidden, into a file named allfiles.txt. Confirm that the file contains the listing.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ ls -a > allfiles.txt
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ ls
allfiles.txt  film3.mp4  film6.mp4  pictures   snap3.jpg  snap6.jpg
film1.mp4     film4.mp4  music      snap1.jpg  snap4.jpg  videos
film2.mp4     film5.mp4  picture    snap2.jpg  snap5.jpg  work
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

8. In the command window, display today's date with day of the week, month, date and year

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ date
Tuesday 17 August 2021 08:06:28 PM IST
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

9. Add the user Juliet

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo useradd juliet
[sudo] password for sangeetha:
```

10. Confirm that Juliet has been added by examining the /etc/passwd file

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ cat /etc/passwd | grep
juliet
juliet:x:20001:20001::/home/juliet:/bin/sh
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

11. Use the passwd command to initialize Juliet's password

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo passwd juliet
New password:
Retype new password:
passwd: password updated successfully
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

12. Create a supplementary group called Shakespeare with a group id of 300

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo groupadd -g 30000  
shakespeare
```

13. Create a supplementary group called artists.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo groupadd artist
```

14. Confirm that Shakespeare and artists have been added by examining the /etc/group file.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ less /etc/group  
shakespeare:x:30000:  
artist:x:30001:  
(END)
```

15. Add the Juliet user to the Shakespeare group as a supplementary group.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo usermod -G shakespeare juliet
```

16. Confirm that Juliet has been added using the id command.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ id juliet  
uid=20001(juliet) gid=20001(juliet) groups=20001(juliet),30000(shakespeare)  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

17. Add Romeo and Hamlet to the Shakespeare group.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo useradd Romeo  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo useradd Hamlet  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo usermod -G shakespeare Romeo  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo usermod -G shakespeare Hamlet
```

18. Add Reba, Dolly and Elvis to the artists group.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo useradd Reba  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo useradd Dolly  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo useradd Elvis  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo usermod -G artist Reba  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo usermod -G artist Dolly  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo usermod -G artist Elvis  
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$
```

19. Verify the supplemental group memberships by examining the /etc/group file.

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ less /etc/group
juliet:x:20001:
shakespheare:x:30000:juliet,Romeo,Hamlet
artist:x:30001:Reba,Dolly,Elvis
Romeo:x:20002:
Hamlet:x:20003:
Reba:x:20004:
Dolly:x:20005:
Elvis:x:20006:
(END)
```

20. Attempt to remove user Dolly

```
sangeetha@sangeetha-VirtualBox:~/Documents/assignment5$ sudo userdel Dolly
[sudo] password for sangeetha:
```

2.Try out these network commands in Window as well as in Linuxand perform at least 4 options with each command: ping, route, traceroute, nslookup, Ip Config, NetStat .

1. Ping & traceroute tests

Ping and Trace Route tests can help to identify any connection issues between your network and a specified server (or website) address.

PING test

The PING command is used to test the connection and latency between two network connections. The PING command sends packets of information to a specified IP Address and then measures the time it takes to get a response from the specified computer or device.

Trace Route test

The TRACERT command is used to conduct a similar test to PING, but instead of displaying the time it takes to connect, it looks at the exact server hops required to connect your computer to the server.

You should already have the CMD prompt dialogue box open, after performing the PING

```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.
```

```
C:\Users\SangithaNandu>ping google.com
```

```
Pinging google.com [142.250.193.110] with 32 bytes of data:
Reply from 142.250.193.110: bytes=32 time=21ms TTL=116
Reply from 142.250.193.110: bytes=32 time=20ms TTL=116
Reply from 142.250.193.110: bytes=32 time=21ms TTL=116
Reply from 142.250.193.110: bytes=32 time=20ms TTL=116
```

```
Ping statistics for 142.250.193.110:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 21ms, Average = 20ms
```

```
C:\Users\SangithaNandu>tracert www.google.com
```

```
Tracing route to www.google.com [142.250.196.36]
over a maximum of 30 hops:
```

```
 1      3 ms      2 ms      3 ms  192.168.1.1
 2      6 ms      5 ms      6 ms  117.251.28.1
 3      6 ms      5 ms      5 ms  static.ill.218.248.113.189/24.bsnl.in [218.248.113.189]
 4      8 ms      5 ms      5 ms  static.ill.218.248.120.150/24.bsnl.in [218.248.120.150]
 5      *         *         * Request timed out.
 6     22 ms     22 ms     *  117.216.207.222
 7     19 ms     20 ms     20 ms  72.14.218.250
 8     23 ms     22 ms     23 ms  216.239.47.9
 9     21 ms     19 ms     21 ms  142.251.55.31
10     21 ms     23 ms     24 ms  maa03s45-in-f4.1e100.net [142.250.196.36]
```

```
Trace complete.
```

```
C:\Users\SangithaNandu>
```

1. Nslookup

Microsoft Windows includes a tool called NSLOOKUP that you can use via the command prompt. This tool can be used to check DNS records propagation and resolution using

```
c:\Users\SangithaNandu>nslookup aesajce.in
Server: multiplay.bsnl.in
Address: 218.248.112.1

Non-authoritative answer:
Name: aesajce.in
Address: 103.120.179.46

C:\Users\SangithaNandu>
```

- Type nslookup -q=XX where XX is a type of a DNS record. Some of the available types are MX, A, CNAME, and TXT. The records are then displayed, to exit the tool type exit

```
C:\Users\SangithaNandu>nslookup -type=ns aesajce.in
Server: multiplay.bsnl.in
Address: 218.248.112.1

Non-authoritative answer:
aesajce.in      nameserver = ns2.ajcemca.in
aesajce.in      nameserver = ns1.aessas.com
aesajce.in      nameserver = ns1.ajcemca.in
aesajce.in      nameserver = ns2.aessas.com

C:\Users\SangithaNandu>
```

- To use **nslookup** as a troubleshooting tool, you can set the specific type of record to lookup for a domain by using the **-type=record_type** where **record_type** is A, CNAME, MX, PTR, NS, ANY. Type **nslookup -type=ns domain_name** where **domain_name** is the domain for your query and hit **Enter**. Now the tool will display the name servers for the domain you specified.

```
N C:\Users\SangithaNandu>nslookup -q=MX aesajce.in
Server: multiplay.bsnl.in
Address: 218.248.112.1

Non-authoritative answer:
aesajce.in      MX preference = 1, mail exchanger = aspmx.l.google.com
aesajce.in      MX preference = 10, mail exchanger = aspmx3.googlemail.com
aesajce.in      MX preference = 10, mail exchanger = aspmx2.googlemail.com
aesajce.in      MX preference = 5, mail exchanger = alt2.aspmx.l.google.com
aesajce.in      MX preference = 5, mail exchanger = alt1.aspmx.l.google.com

C:\Users\SangithaNandu>
```

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2. Netstat

On Windows 10, netstat (network statistics) has been around for a long time, and it's a command-line tool that you can use in Command Prompt to display statistics for all network connections. It allows you to understand open and connected ports to monitor and

```
C:\Users\SangithaNandu>netstat
```

for system or applications.

```
Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.1.6:49623      sa-in-f188:5228      ESTABLISHED
  TCP    192.168.1.6:52053      20.197.71.89:https  ESTABLISHED
  TCP    192.168.1.6:53804      a104-114-69-175:https ESTABLISHED
  TCP    192.168.1.6:56684      a104-114-101-152:https CLOSE_WAIT
  TCP    192.168.1.6:56685      a104-114-101-152:https CLOSE_WAIT
  TCP    192.168.1.6:56686      a104-114-88-69:http   CLOSE_WAIT
  TCP    192.168.1.6:56687      a104-114-88-69:http   CLOSE_WAIT
  TCP    192.168.1.6:56689      a104-118-7-72:https  CLOSE_WAIT
  TCP    192.168.1.6:56690      a104-118-7-72:https  CLOSE_WAIT
  TCP    192.168.1.6:57847      20.198.162.76:https ESTABLISHED
  TCP    192.168.1.6:64050      a184-31-215-15:http  TIME_WAIT
```

```
C:\Users\SangithaNandu>
```

netstat -n

command to display active connections showing numeric IP address and port number instead of trying to determine the names .

netstat -n INTERVAL

In the command, make sure to replace INTERVAL for the number (in seconds) you want to redisplay the information.

N C:\Users\SangithaNandu>netstat -n 5

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Active Connections

Proto	Local Address	Foreign Address	State
TCP	192.168.1.6:49623	74.125.200.188:5228	ESTABLISHED
TCP	192.168.1.6:51309	13.33.183.219:443	TIME_WAIT
TCP	192.168.1.6:52053	20.197.71.89:443	ESTABLISHED
TCP	192.168.1.6:53398	142.250.196.3:443	TIME_WAIT
TCP	192.168.1.6:53804	104.114.69.175:443	ESTABLISHED
TCP	192.168.1.6:53834	35.173.119.102:443	TIME_WAIT
TCP	192.168.1.6:56684	104.114.101.152:443	CLOSE_WAIT
TCP	192.168.1.6:56685	104.114.101.152:443	CLOSE_WAIT
TCP	192.168.1.6:56686	104.114.88.69:80	CLOSE_WAIT
TCP	192.168.1.6:56687	104.114.88.69:80	CLOSE_WAIT
TCP	192.168.1.6:56689	104.118.7.72:443	CLOSE_WAIT
TCP	192.168.1.6:56690	104.118.7.72:443	CLOSE_WAIT
TCP	192.168.1.6:57847	20.198.162.76:443	ESTABLISHED
TCP	192.168.1.6:63139	35.173.119.102:443	TIME_WAIT
TCP	192.168.1.6:64052	204.79.197.203:443	ESTABLISHED
TCP	192.168.1.6:64053	204.79.197.203:443	ESTABLISHED
TCP	192.168.1.6:64055	117.239.141.123:443	CLOSE_WAIT
TCP	192.168.1.6:64058	52.231.207.240:443	ESTABLISHED
TCP	192.168.1.6:64059	13.33.146.93:443	ESTABLISHED
TCP	192.168.1.6:64060	205.251.253.10:80	ESTABLISHED
TCP	192.168.1.6:64061	13.33.183.14:80	ESTABLISHED
TCP	192.168.1.6:64062	204.79.197.200:443	ESTABLISHED
TCP	192.168.1.6:64063	104.118.7.42:443	CLOSE_WAIT
TCP	192.168.1.6:64064	204.79.197.200:443	ESTABLISHED
TCP	192.168.1.6:64065	104.114.86.151:443	ESTABLISHED
TCP	192.168.1.6:64067	13.69.109.130:443	ESTABLISHED
TCP	[::1]:53401	[::1]:5985	SYN_SENT

netstat -a

The netstat -a command displays all active and inactive connections, and the TCP and UDP ports the device is currently listening.

```
N:\Users\K M Abhijith>netstat -a
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:135	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:445	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:3305	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:5040	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:5357	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:7680	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:33060	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:49664	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:49665	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:49666	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:49667	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:49668	DESKTOP-ILB31AE:0	LISTENING
TCP	0.0.0.0:49669	DESKTOP-ILB31AE:0	LISTENING
TCP	127.0.0.1:1001	DESKTOP-ILB31AE:0	LISTENING
TCP	127.0.0.1:27017	DESKTOP-ILB31AE:0	LISTENING
TCP	127.0.0.1:49670	DESKTOP-ILB31AE:49671	ESTABLISHED
TCP	127.0.0.1:49671	DESKTOP-ILB31AE:49670	ESTABLISHED
TCP	127.0.0.1:49672	DESKTOP-ILB31AE:49673	ESTABLISHED
TCP	127.0.0.1:49673	DESKTOP-ILB31AE:49672	ESTABLISHED
TCP	127.0.0.1:51374	DESKTOP-ILB31AE:65001	ESTABLISHED
TCP	127.0.0.1:56487	DESKTOP-ILB31AE:0	LISTENING
TCP	127.0.0.1:56487	DESKTOP-ILB31AE:57828	ESTABLISHED
TCP	127.0.0.1:56525	DESKTOP-ILB31AE:0	LISTENING
TCP	127.0.0.1:57828	DESKTOP-ILB31AE:56487	ESTABLISHED
TCP	127.0.0.1:65001	DESKTOP-ILB31AE:0	LISTENING
TCP	127.0.0.1:65001	DESKTOP-ILB31AE:51374	ESTABLISHED
TCP	192.168.1.33:139	DESKTOP-ILB31AE:0	LISTENING
TCP	192.168.1.33:49265	103.229.205.243:https	ESTABLISHED

netstat -b

The netstat -b command lists all the executables (applications) associated with each connection. Sometimes, applications may open multiple connections.

netstat -e

The netstat -e command generates a statistic of the network interface, which shows

information like the number of bytes, unicast and non-unicast sent and received packets. You can also see discarded packets and errors and unknown protocols, which can you troubleshoot networking problems.

```
C:\Users\SangithaNandu>netstat -a

Active Connections

Proto Local Address          Foreign Address        State
TCP   0.0.0.0:135            LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:445            LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:5040           LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:8733           LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:49664          LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:49665          LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:49666          LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:49667          LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:49668          LAPTOP-7RR29N59:0    LISTENING
TCP   0.0.0.0:49669          LAPTOP-7RR29N59:0    LISTENING
TCP   192.168.1.6:139         LAPTOP-7RR29N59:0    LISTENING
TCP   192.168.1.6:49623       sa-in-f188:5228     ESTABLISHED
TCP   192.168.1.6:49754       204.79.197.219:https TIME_WAIT
```

3. ipconfig

Displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. Used without parameters, ipconfig displays Internet Protocol version 4 (IPv4) and IPv6 addresses, subnet mask, and default gateway for all adapters.

PARAMETERS:

/all: Displays the full TCP/IP configuration for all adapters. Adapters can represent physical interfaces, such as installed network adapters, or logical interfaces, such as dial-up connections.

/displaydns: Displays the contents of the DNS client resolver cache, which includes both entries preloaded from the local Hosts file and any recently obtained resource records for name queries resolved by the computer. The DNS Client service uses this information to resolve frequently queried names quickly, before querying its configured DNS servers.

/flushdns: Flushes and resets the contents of the DNS client resolver cache. During DNS troubleshooting, you can use this procedure to discard negative cache entries from the cache, as well as any other entries that have been added dynamically.

/registerdns: Initiates manual dynamic registration for the DNS names and IP addresses that are configured at a computer. You can use this parameter to troubleshoot a failed DNS name registration or resolve a dynamic update problem between a client and the DNS server without rebooting the client computer. The DNS settings in the advanced

properties of the TCP/IP protocol determine which names are registered in DNS.

```
C:\Users\SangithaNandu>ipconfig /all

Windows IP Configuration

Host Name . . . . . : LAPTOP-7RR29N59
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Realtek PCIe GbE Family Controller
Physical Address. . . . . : C4-65-16-E6-CC-E4
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . . . . . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : 48-5F-99-57-DD-F7
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . . . . . :
Description . . . . . : Realtek RTL8723DE 802.11b/g/n PCIe Adapter
Physical Address. . . . . : 48-5F-99-57-DD-F7
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . . : Yes
Link-local IPv6 Address . . . . . : fe80::a935:c00c:89cc:3da5%16(Preferred)
IPv4 Address. . . . . : 192.168.1.6(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : 13 September 2021 22:02:38
```

```
N:\C:\Users\SangithaNandu>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . :
    Link-local IPv6 Address . . . . . : fe80::a935:c00c:89cc:3da5%16
    IPv4 Address. . . . . : 192.168.1.6
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . :

C:\Users\SangithaNandu>
```

Other Networking Commands

1. Hostname Command

A very simple command that displays the host name of your machine. This is much quicker than going to the control **panel>system** route.

2. getmac Command

Another very simple command that shows the MAC address of your network interfaces

3.arp Command

This is used for showing the address resolution cache. This command must be used with a command line switch arp -a is the most common.

4. Nbtstat

Diagnostic tool for troubleshooting netBIOS problems.

5. Net Command

Used for managing users,service,shares etc..

```
C:\Users\SangithaNandu>net
The syntax of this command is:

NET
[ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |
HELPMSG | LOCALGROUP | PAUSE | SESSION | SHARE | START |
STATISTICS | STOP | TIME | USE | USER | VIEW ]

C:\Users\SangithaNandu>hostname
LAPTOP-7RR29N59

C:\Users\SangithaNandu>nbtstat

Displays protocol statistics and current TCP/IP connections using NBT
(NetBIOS over TCP/IP).

NBTSTAT [ [-a RemoteName] [-A IP address] [-c] [-n]
          [-r] [-R] [-RR] [-s] [-S] [interval] ]

-a (adapter status) Lists the remote machine's name table given its name
-A (Adapter status) Lists the remote machine's name table given its
IP address.
-c (cache)           Lists NBT's cache of remote [machine] names and their IP addresses
-n (names)          Lists local NetBIOS names.
-r (resolved)       Lists names resolved by broadcast and via WINS
-R (Reload)         Purges and reloads the remote cache name table
-S (Sessions)      Lists sessions table with the destination IP addresses
-s (sessions)       Lists sessions table converting destination IP
                    addresses to computer NETBIOS names.
-RR (ReleaseRefresh) Sends Name Release packets to WINS and then, starts Refresh

RemoteName   Remote host machine name.
IP address   Dotted decimal representation of the IP address.
interval     Redisplays selected statistics, pausing interval seconds
            between each display. Press Ctrl+C to stop redisplaying
            statistics.

C:\Users\SangithaNandu>
```

```
C:\Users\SangithaNandu>getmac

Physical Address      Transport Name
===== =====
48-5F-99-57-DD-F7    \Device\Tcpip_{BDAF5285-D018-4DDE-897B-95F031DFE75A}
C4-65-16-E6-CC-E4    Media disconnected
48-5F-99-57-DD-F8    Media disconnected

C:\Users\SangithaNandu>arp -a

Interface: 192.168.1.6 --- 0x10
Internet Address      Physical Address      Type
192.168.1.1            4c-ae-1c-40-1c-45    dynamic
192.168.1.255          ff-ff-ff-ff-ff-ff    static
224.0.0.22              01-00-5e-00-00-16    static
224.0.0.251             01-00-5e-00-00-fb    static
224.0.0.252             01-00-5e-00-00-fc    static
239.255.255.250        01-00-5e-7f-ff-fa    static
255.255.255.255        ff-ff-ff-ff-ff-ff    static

C:\Users\SangithaNandu>
```

3. LAMP Installation

Install Apache2

Update your system:

```
sudo apt update
```

Install Apache using apt:

```
sudo apt install apache2
```

Confirm that Apache is now running with the following command:

```
sudo systemctl status apache2
```

```
Active: active (running) since Tue 2021-09-28 10:30:33 EDT; 22s ago
  Docs: https://httpd.apache.org/docs/2.4/
Process: 1102 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
Main PID: 1113 (apache2)
  Tasks: 6 (limit: 2296)
 Memory: 21.2M
    CPU: 175ms
CGroup: /system.slice/apache2.service
└─1113 /usr/sbin/apache2 -k start
   ├─1115 /usr/sbin/apache2 -k start
   ├─1116 /usr/sbin/apache2 -k start
   ├─1117 /usr/sbin/apache2 -k start
   ├─1118 /usr/sbin/apache2 -k start
   └─1119 /usr/sbin/apache2 -k start
```

Welcome to Kali Linux

The Industry's Most Advanced Penetration Testing Distribution

Now that you have successfully downloaded Kali Linux, here are some good resources to help you get started:

If it is not working !

```
sudo systemctl stop apache2 # to stop if running
sudo systemctl start apache2 # to start if not running
```

Once installed, test by accessing your server's IP in your browser:

http://127.0.0.1/

http://localhost/

OUTPUT :



Apache2 Ubuntu Default Page

ubuntu

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

Install mariadb

```
sudo apt install mariadb-server mariadb-client
```

```
sudo systemctl status mysql # to check status
```

```
sudo systemctl start mysql # if not running
```

```
sudo mysql_secure_installation # Secure your newly installed MariaDB service
```

```
(root@kali)-[~]
# systemctl status mysql
mariadb.service - MariaDB 10.5.12 database server
  Loaded: loaded (/lib/systemd/system/mariadb.service; disabled; vendor preset: disabled)
  Active: active (running) since Tue 2021-09-28 10:32:23 EDT; 36s ago
    Docs: man:mariadb(8)
          https://mariadb.com/kb/en/library/systemd/
   Process: 1179 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysqld (code=exited, status=0/SUCCESS)
   Process: 1180 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 1182 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR=`cd /usr/bin/..; /usr/bin/galera_recovery`; [ $? -eq 0 ] && systemctl set-environment _WSREP_S
   Process: 1244 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 1246 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
Main PID: 1230 (mariadb)
  Status: "Taking your SQL requests now..."
   Tasks: 14 (limit: 2296)
  Memory: 101.4M
     CPU: 493ms
    CGroup: /system.slice/mariadb.service
            └─1230 /usr/sbin/mariadb
```

Install PHP and commonly used modules

```
sudo apt install php libapache2-mod-php php-ocache php-cli php-gd  
php-curl php-mysql
```

```
sudo systemctl restart apache2
```

Test PHP Processing on Web Server

```
sudo nano /var/www/html/phpinfo.php
```

Inside the file, type in the valid PHP code:

```
<?php  
    phpinfo();  
?>
```

Press CTRL + X to save and close the file. Press y and ENTER to confirm
Open a browser and type in your IP address/phpinfo.php

```
http://127.0.0.1/phpinfo.php
```

OUTPUT :

PHP Version 7.4.3



System	Linux kmabhijith-VirtualBox 5.11.0-27-generic #29~20.04.1-Ubuntu SMP Wed Aug 11 15:58:17 UTC 2021 x86_64
Build Date	Aug 13 2021 05:39:12
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.4/apache2
Loaded Configuration File	/etc/php/7.4/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.4/apache2/conf.d
Additional .ini files parsed	/etc/php/7.4/apache2/conf.d/10-mysqlind.ini, /etc/php/7.4/apache2/conf.d/10-ocache.ini, /etc/php/7.4/apache2/conf.d/10-pdo.ini, /etc/php/7.4/apache2/conf.d/15-xml.ini, /etc/php/7.4/apache2/conf.d/20-bz2.ini, /etc/php/7.4/apache2/conf.d/20-calendar.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-exif.ini, /etc/php/7.4/apache2/conf.d/20-ffi.ini, /etc/php/7.4/apache2/conf.d/20-fileinfo.ini, /etc/php/7.4/apache2/conf.d/20-ftp.ini, /etc/php/7.4/apache2/conf.d/20-dom.ini, /etc/php/7.4/apache2/conf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-gd.ini, /etc/php/7.4/apache2/conf.d/20-gettext.ini, /etc/php/7.4/apache2/conf.d/20-icconv.ini, /etc/php/7.4/apache2/conf.d/20-isbn.ini, /etc/php/7.4/apache2/conf.d/20-mbstring.ini, /etc/php/7.4/apache2/conf.d/20-

Install phpmyadmin

```
sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl
```

```
sudo systemctl restart apache2
```

Open a browser : http://localhost/phpmyadmin

username : root

password : yourpasswordIf phpmyadmin page not found :

```
nano /etc/apache2/apache2.conf
```

Add this line to last of the file.

Press CTRL + X to save and close the file. Press y and ENTER to confirm

```
Include /etc/phpmyadmin/apache.conf
```

```
restart apache2 - now try : http://localhost/phpmyadmin
```

```
sudo systemctl restart apache2
```

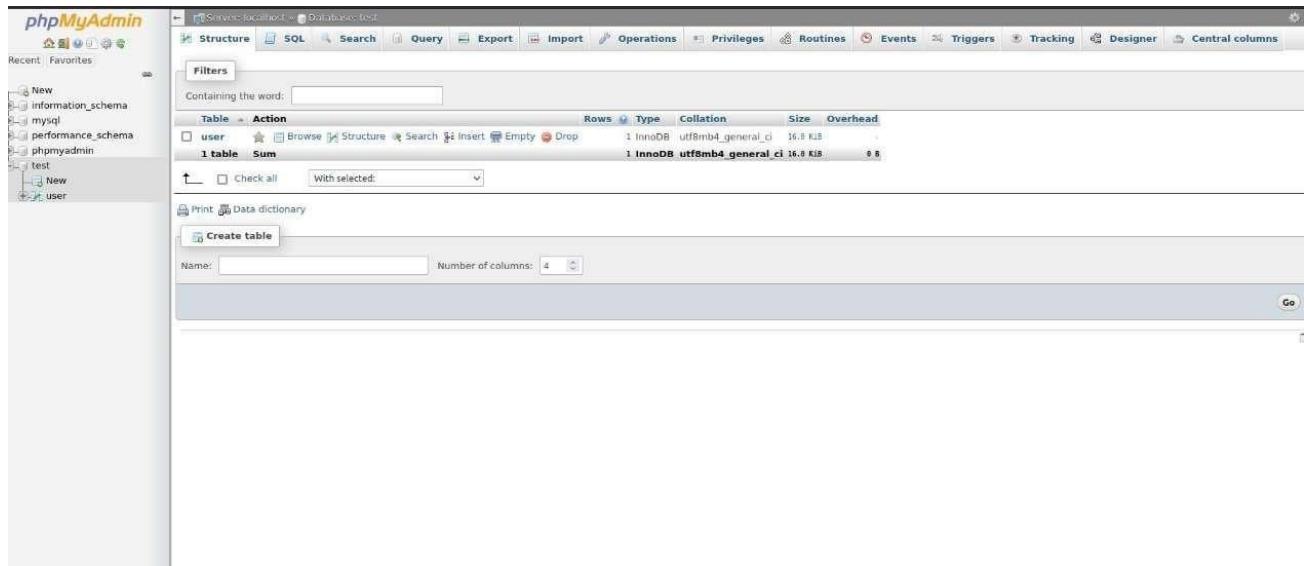
If any problem for login run the following command

```
sudo mysql
```

```
ALTER USER root@localhost IDENTIFIED BY "yourpassword";
```

OUTPUT :

The screenshot shows the phpMyAdmin login interface. At the top is the logo "phpMyAdmin" with a yellow sailboat icon. Below it is the heading "Welcome to phpMyAdmin". A "Language" dropdown menu is set to "English". A "Log in" button is present. The "Username" field contains "root" and the "Password" field contains "....".



The screenshot shows the phpMyAdmin main interface for the "test" database. On the left is a sidebar with a tree view of databases: "New", "information_schema", "mysql", "performance_schema", "phpmyadmin", and "test". The "user" table under the "test" database is selected. The table structure is shown with columns: "Rows", "Type", "Collation", "Size", and "Overhead". There is one row for the "user" table, which is InnoDB, utf8mb4_general_ci, 16.8 KB, and 0 B.

1.Ansible Installation

Step1: sudo apt install ansible

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo apt install ansible
[sudo] password for sangeetha:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ieee-data python3-argcomplete python3-crypto python3-distutils
  python3-dnspython python3-jinja2 python3-jmespath python3-kerberos
  python3-lib2to3 python3-libcloud python3-netaddr python3-ntlm-auth
  python3-requests-kerberos python3-requests-ntlm python3-selinux
  python3-winrm python3-xmldict
Suggested packages:
  cowsay sshpass python-jinja2-doc ipython3 python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-distutils
  python3-dnspython python3-jinja2 python3-jmespath python3-kerberos
  python3-libcloud python3-netaddr python3-ntlm-auth
  python3-requests-kerberos python3-requests-ntlm python3-selinux
  python3-winrm python3-xmldict
The following packages will be upgraded:
  python3-lib2to3
1 upgraded, 17 newly installed, 0 to remove and 334 not upgraded.
Need to get 9,865 kB/9,942 kB of archives.
After this operation, 92.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-jinja2 all 2
.10.1-2 [95.5 kB]
Ign:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-jinja2 all 2
```

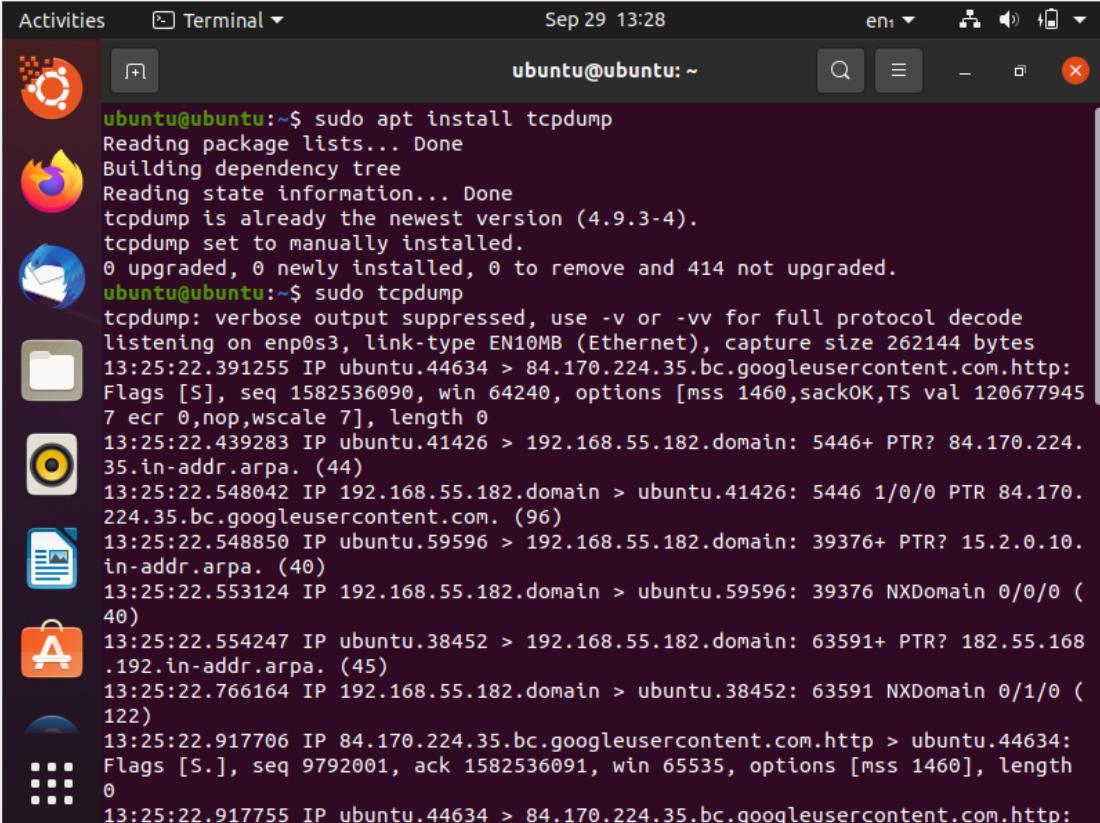
Installation check

Step2:ansible –version

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['~/home/sangeetha/.ansible/plugins/modules',
  '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.8.5 (default, Jul 28 2020, 12:59:40) [GCC 9.3.0]
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

5.Tcpdump installation

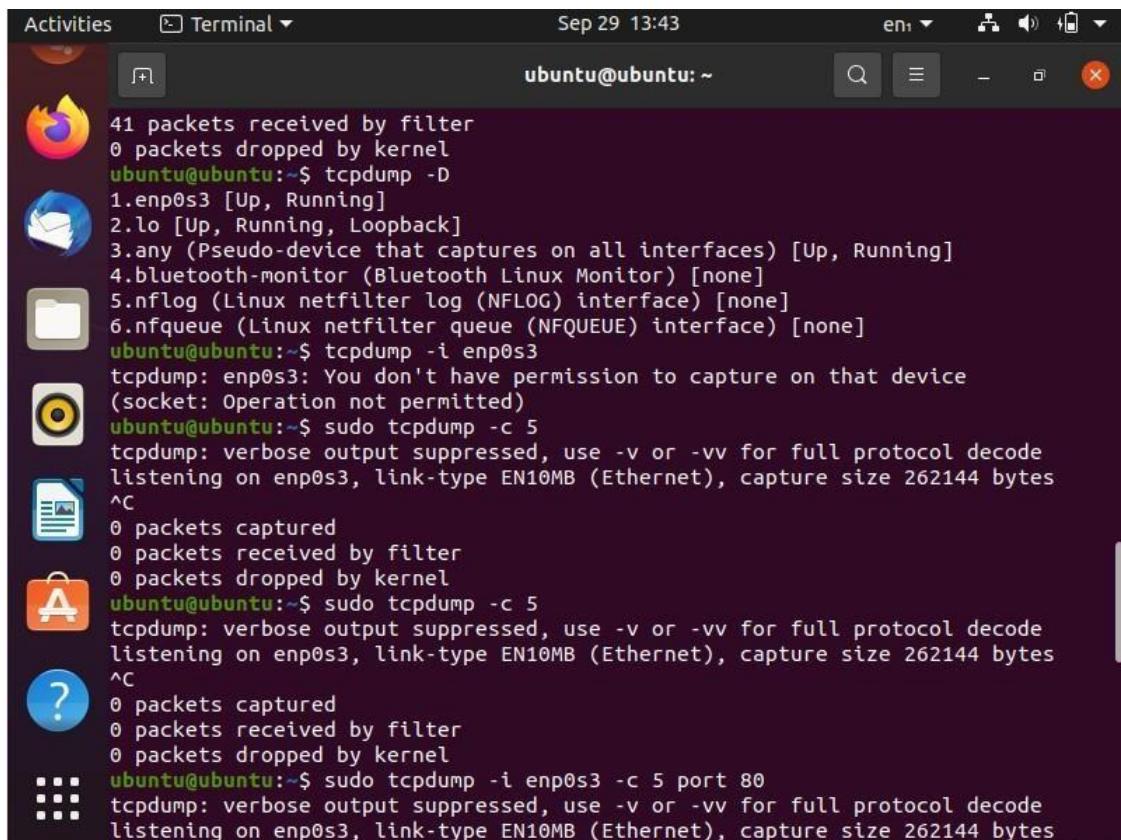
- Sudo apt install tcpdump
- Sudo tcpdump



Activities Terminal Sep 29 13:28 en1 ubuntu@ubuntu: ~

```
ubuntu@ubuntu:~$ sudo apt install tcpdump
Reading package lists... Done
Building dependency tree
tcpdump is already the newest version (4.9.3-4).
tcpdump set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 414 not upgraded.
ubuntu@ubuntu:~$ sudo tcpdump
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:25:22.391255 IP ubuntu.44634 > 84.170.224.35.bc.googleusercontent.com.http:
Flags [S], seq 1582536090, win 64240, options [mss 1460,sackOK,TS val 120677945
7 ecr 0,nop,wscale 7], length 0
13:25:22.439283 IP ubuntu.41426 > 192.168.55.182.domain: 5446+ PTR? 84.170.224.
35.in-addr.arpa. (44)
13:25:22.548042 IP 192.168.55.182.domain > ubuntu.41426: 5446 1/0/0 PTR 84.170.
224.35.bc.googleusercontent.com. (96)
13:25:22.548850 IP ubuntu.59596 > 192.168.55.182.domain: 39376+ PTR? 15.2.0.10.
in-addr.arpa. (40)
13:25:22.553124 IP 192.168.55.182.domain > ubuntu.59596: 39376 NXDomain 0/0/0 (40)
13:25:22.554247 IP ubuntu.38452 > 192.168.55.182.domain: 63591+ PTR? 182.55.168
.192.in-addr.arpa. (45)
13:25:22.766164 IP 192.168.55.182.domain > ubuntu.38452: 63591 NXDomain 0/1/0 (122)
13:25:22.917706 IP 84.170.224.35.bc.googleusercontent.com.http > ubuntu.44634:
Flags [S.], seq 9792001, ack 1582536091, win 65535, options [mss 1460], length 0
13:25:22.917755 IP ubuntu.44634 > 84.170.224.35.bc.googleusercontent.com.http:
```

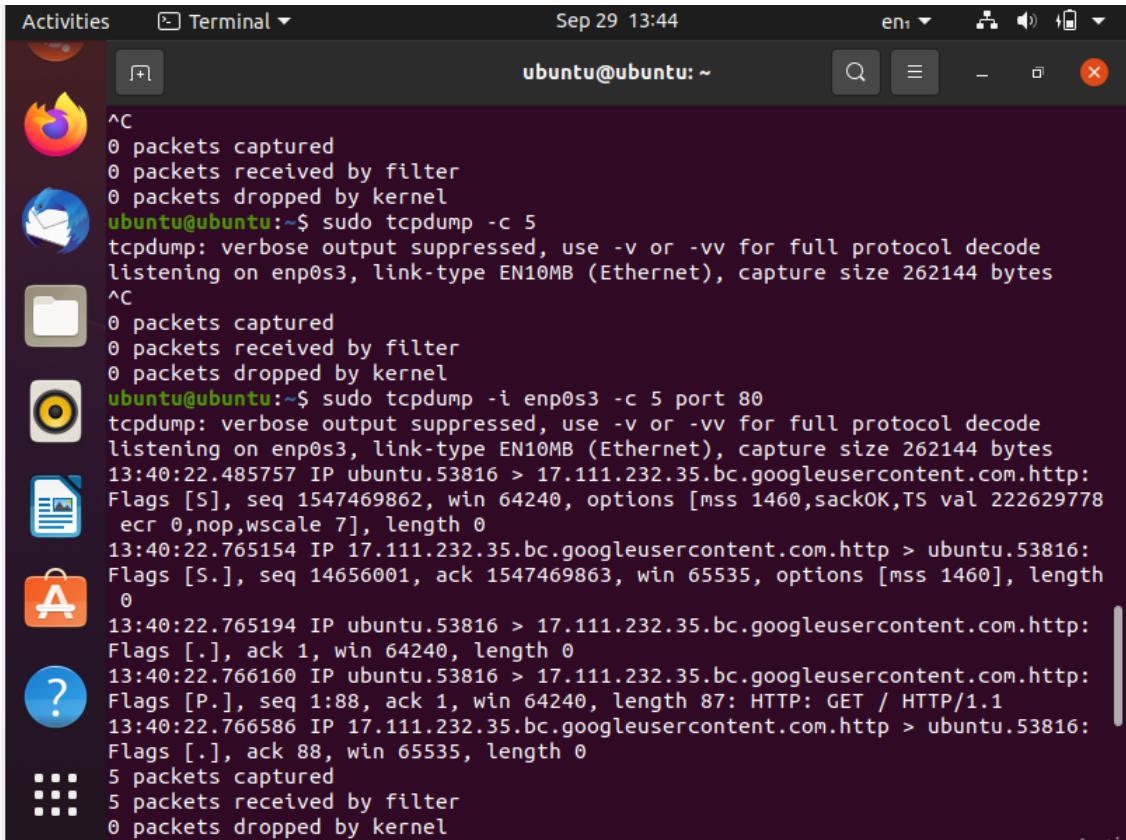
- tcpdump -D
- tcpdump-i enp0s3
- sudo tcpdump -c 5



A screenshot of a Ubuntu desktop environment. In the center is a terminal window titled "Terminal". The terminal shows the following command history:

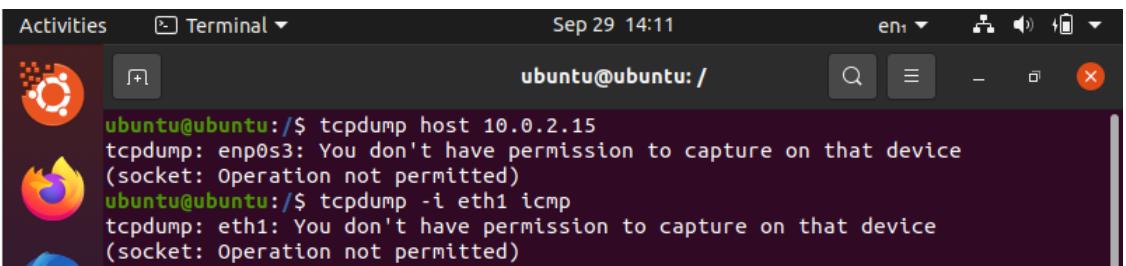
```
Activities Terminal Sep 29 13:43 en1: en1: en1: en1:  
ubuntu@ubuntu:~$ tcpdump -D  
41 packets received by filter  
0 packets dropped by kernel  
ubuntu@ubuntu:~$ tcpdump -D  
1.enp0s3 [Up, Running]  
2.lo [Up, Running, Loopback]  
3.any (Pseudo-device that captures on all interfaces) [Up, Running]  
4.bluetooth-monitor (Bluetooth Linux Monitor) [none]  
5.nflog (Linux netfilter log (NFLOG) interface) [none]  
6.nfqueue (Linux netfilter queue (NFQUEUE) interface) [none]  
ubuntu@ubuntu:~$ tcpdump -i enp0s3  
tcpdump: enp0s3: You don't have permission to capture on that device  
(socket: Operation not permitted)  
ubuntu@ubuntu:~$ sudo tcpdump -c 5  
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode  
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes  
^C  
0 packets captured  
0 packets received by filter  
0 packets dropped by kernel  
ubuntu@ubuntu:~$ sudo tcpdump -c 5  
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode  
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes  
^C  
0 packets captured  
0 packets received by filter  
0 packets dropped by kernel  
ubuntu@ubuntu:~$ sudo tcpdump -i enp0s3 -c 5 port 80  
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode  
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
```

- Sudo tcpdump -i enp0s3 -c 5 port 80



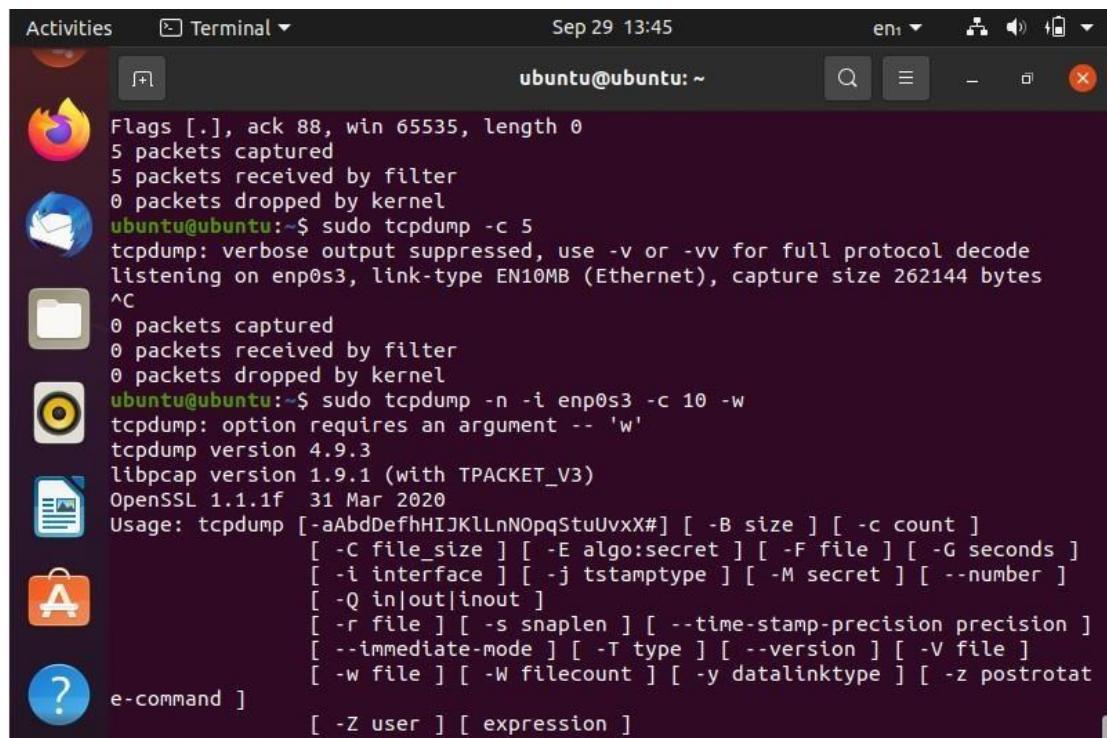
```
Activities Terminal Sep 29 13:44 en1
ubuntu@ubuntu: ~
^C
0 packets captured
0 packets received by filter
0 packets dropped by kernel
ubuntu@ubuntu:~$ sudo tcpdump -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
^C
0 packets captured
0 packets received by filter
0 packets dropped by kernel
ubuntu@ubuntu:~$ sudo tcpdump -i enp0s3 -c 5 port 80
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
13:40:22.485757 IP ubuntu.53816 > 17.111.232.35.bc.googleusercontent.com.http:
Flags [S], seq 1547469862, win 64240, options [mss 1460,sackOK,TS val 222629778
ecr 0,nop,wscale 7], length 0
13:40:22.765154 IP 17.111.232.35.bc.googleusercontent.com.http > ubuntu.53816:
Flags [S.], seq 14656001, ack 1547469863, win 65535, options [mss 1460], length
0
13:40:22.765194 IP ubuntu.53816 > 17.111.232.35.bc.googleusercontent.com.http:
Flags [.], ack 1, win 64240, length 0
13:40:22.766160 IP ubuntu.53816 > 17.111.232.35.bc.googleusercontent.com.http:
Flags [P.], seq 1:88, ack 1, win 64240, length 87: HTTP: GET / HTTP/1.1
13:40:22.766586 IP 17.111.232.35.bc.googleusercontent.com.http > ubuntu.53816:
Flags [.], ack 88, win 65535, length 0
5 packets captured
5 packets received by filter
0 packets dropped by kernel
```

- tcpdump host 10.0.2.15
- tcpdump -l eth1 icmp



```
Activities Terminal Sep 29 14:11 en1
ubuntu@ubuntu: /
ubuntu@ubuntu:/$ tcpdump host 10.0.2.15
tcpdump: enp0s3: You don't have permission to capture on that device
(socket: Operation not permitted)
ubuntu@ubuntu:/$ tcpdump -l eth1 icmp
tcpdump: eth1: You don't have permission to capture on that device
(socket: Operation not permitted)
```

- Sudo tcpdump -n -i enp0s3 -c 10 -w icmp.pcap



A screenshot of a Ubuntu desktop environment. In the top left, there's an 'Activities' button and a 'Terminal' icon. The terminal window is open, showing a command-line interface. The title bar says 'ubuntu@ubuntu: ~'. The terminal shows the following output:

```
Flags [.], ack 88, win 65535, length 0
5 packets captured
5 packets received by filter
0 packets dropped by kernel
ubuntu@ubuntu:~$ sudo tcpdump -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
^C
0 packets captured
0 packets received by filter
0 packets dropped by kernel
ubuntu@ubuntu:~$ sudo tcpdump -n -i enp0s3 -c 10 -w
tcpdump: option requires an argument -- 'w'
tcpdump version 4.9.3
libpcap version 1.9.1 (with TPACKET_V3)
OpenSSL 1.1.1f 31 Mar 2020
Usage: tcpdump [-aAbdDefhHIJKLMNOPqStuUvxX#] [ -B size ] [ -c count ]
          [ -C file_size ] [ -E algo:secret ] [ -F file ] [ -G seconds ]
          [ -i interface ] [ -j tstamptype ] [ -M secret ] [ --number ]
          [ -Q in|out|inout ]
          [ -r file ] [ -s snaplen ] [ --time-stamp-precision precision ]
          [ --immediate-mode ] [ -T type ] [ --version ] [ -V file ]
          [ -w file ] [ -W filecount ] [ -y datalinktype ] [ -z postrotat
          [ -Z user ] [ expression ]
```

6.Shell scripting

1. Write a shell script to ask your name, and college name and print it on the screen.

```
echo "enter details and view"
echo enter your name
read name
echo enter your college name
read c
clear
echo Details you entered
echo Name:$name
echo College:$c
```

OUTPUT:



```
i#!/bin/bash
echo enter your name
read sangeetha
echo amal jyothi college
echo name:$name
echo college :$amal jyothi college
```

2. Write a shell script to set a value for a variable and display it on command line interface.

```
echo "Display value of a variable"
a=50
echo $a
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 2.sh
Display value of a variable
50
```

3. Write a shell script to perform addition, subtraction, multiplication, division with two numbers that is accepted from user.

```
echo enter a number
read a
echo enter another number
read b
echo enter operation
echo "\n1.addition \n2.subtraction \n3.multiplication \n4.division"
read op
case "$op" in
"1") echo "a+b=$((a+b));;
"2") echo "a-b=$((a-b));;
"3") echo "a*b=$((a*b));;
"4") echo "a/b=$((a/b));;
esac
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 3.sh
enter a number
7
enter another number
8
enter operation
\n1.addition \n2.subtraction \n3.multiplication \n4.division
2
a-b=-1
```

4. Write a shell script to check the value of a given number and display whether the number is found or not.

```
echo enter a number
read a
if [ $a -eq 10 ];
then
echo "number found"
else
echo "not found"
fi
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 4.sh
enter a number
9
not found
```

5. Write a shell script to display current date, calendar.

```
echo "Today is $(date)"  
echo "calender:"  
cal
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 5.sh  
Today is Saturday 02 October 2021 05:53:45 PM IST  
calender:  
          October 2021  
Su Mo Tu We Th Fr Sa  
            1  2  
 3  4  5  6  7  8  9  
10 11 12 13 14 15 16  
17 18 19 20 21 22 23  
24 25 26 27 28 29 30  
31
```

6. Write a shell script to check a number is even or odd. #!/bin/bash

```
echo enter a number  
read n  
x=$(( $n % 2 ))  
if [ $x -eq 0 ];  
then  
echo "number is even"  
else  
echo "number is odd"  
fi
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 6.sh  
enter a number  
4  
number is even
```

7. Write a shell script to check a number is greater than, less than or equal to another number.

```
echo enter first number  
read a  
echo enter second number  
read b  
if [ $a -gt $b ];  
then
```

```
echo "$a is larger"
elif [ $b -gt $a ];
then
echo "$b is larger"
else
echo "both are equal"
fi
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 7.sh
enter first number
54
enter second number
34
54 is larger
```

8. Write a shell script to find the sum of first 10 numbers.

```
s=0
for ((i=0;i<=10;i++))
do
s=`expr $s + $i`
done
echo "sum of first 10 numbers=$s"
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 8.sh
sum of first 10 numbers=55
```

9. Write a shell script to find the sum, the average and the product of the four integers entered.

```
echo please enter your first number
read a
echo please enter your second number
read b
echo please enter your third number
read c
echo please enter your fourth number
read d
sum=$((a + b + c + d))
prod=$((a * b * c * d))
avg=$(echo $sum/4 | bc -l)
```

```
echo "the sum is:$sum
echo "the average is:$avg
echo "the product is:$prod
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 9.sh
please enter your first number
1
please enter your second number
2
please enter your third number
3
please enter your fourth number
4
the sum is:10
the average is:2.50000000000000000000000000000000
the product is:24
```

10. Write a shell script to find the smallest of three numbers.

```
echo enter first number
read a
echo enter second number
read b
echo enter third number
read c
if [ $a -lt $b ];
then
if [ $a -lt $c ];
then
echo "$a is smallest"
fi
elif [ $b -lt $c ];
then
echo "$b is smallest"
else
echo "$c is smallest";
fi
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 10.sh
enter first number
5
enter second number
2
enter third number
6
2 is smallest
```

11. Write a shell program to find factorial of given number.

```
echo enter a number
read n
f=1
for ((i=2;i<=n;i++))
do
f=$((f*i))
done
echo "factorial is $f"
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 11.sh
enter a number
5
factorial is 120
```

12. Write a shell program to check a number is palindrome or not.

```
echo enter a number
read n
rev=$(echo $n | rev)
if [ $n -eq $rev ];
then
echo "number is palindrome"
else
echo "number is not palindrome"
fi
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 12.sh
enter a number
1221
number is palindrome
```

13. Write a shell script to find the average of the numbers entered in command line.

```
echo enter size
read n
i=1
s=0
echo "enter numbers"
while [ $i -le $n ]
do
read num
s=$((s+num))
i=$((i+1))
done
avg=$(echo $s/$n | bc -l)
echo "average is $avg"
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 13.sh
enter size
5
enter numbers
6
7
8
9
4
average is 6.800000000000000000000000
```

14. Write a shell program to find the sum of all the digits in a number.

```
echo enter a number
read n
s=0
while [ $n -gt 0 ]
do
mod=$((n%10))
s=$((s+mod))
n=$((n/10))
done
echo "sum of digit is $s"
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 14.sh
enter a number
678
sum of digit is 21
```

15. Write a shell Script to check whether given year is leap year or not.

```
echo enter year
read y
a=$((y%4))
b=$((y%100))
c=$((y%400))
if [ $a -eq 0 -a $b -ne 0 -o $c -eq 0 ];
then
echo "$y is leap year"
else
echo "$y is leap year"
fi
```

OUTPUT:

```
user@user-VirtualBox:~$ bash 15.sh
enter year
1994
1994 is leap year
```

7. Docker installation on Windows 10

Step-I

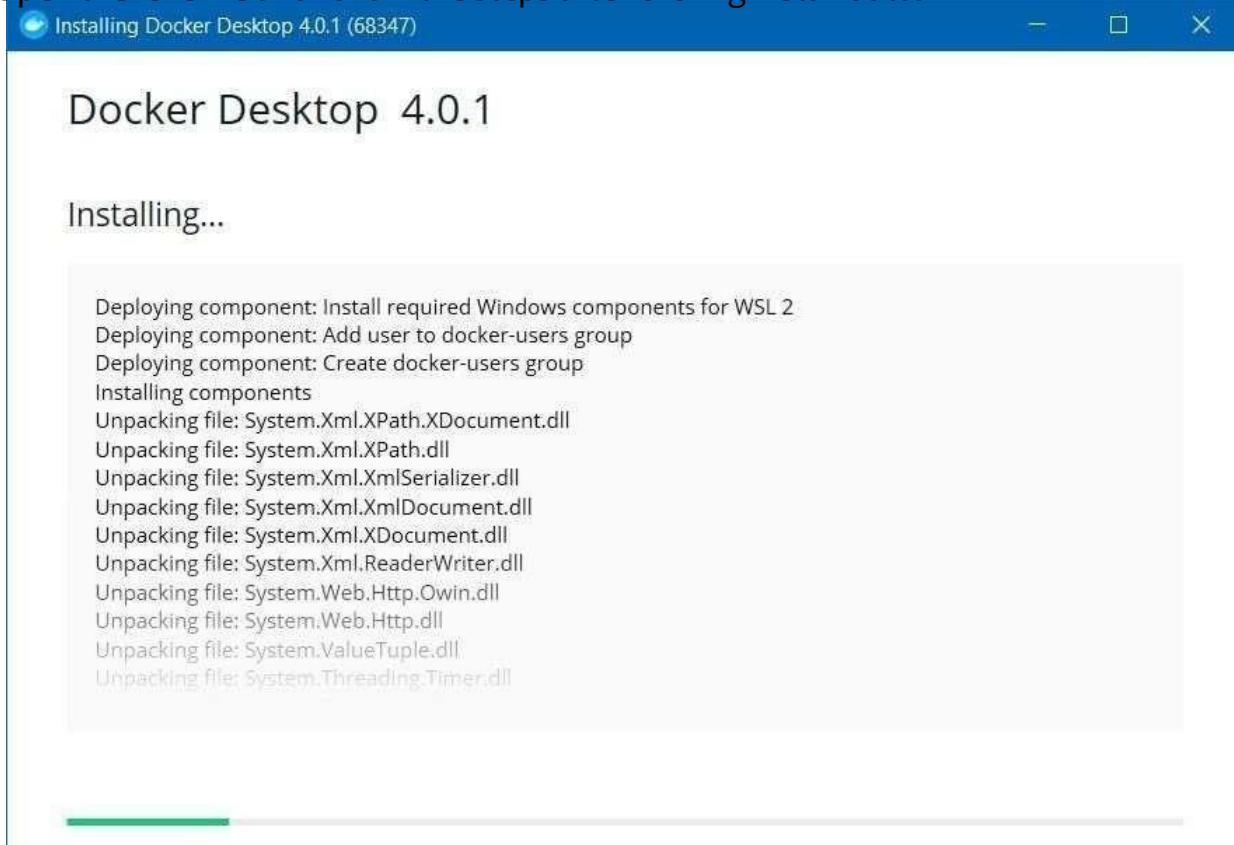
Download Docker desktop Installer for Windows from

<https://desktop.docker.com/win/main/amd64/Docker%20Desktop%20Installer.exe>



Step-II

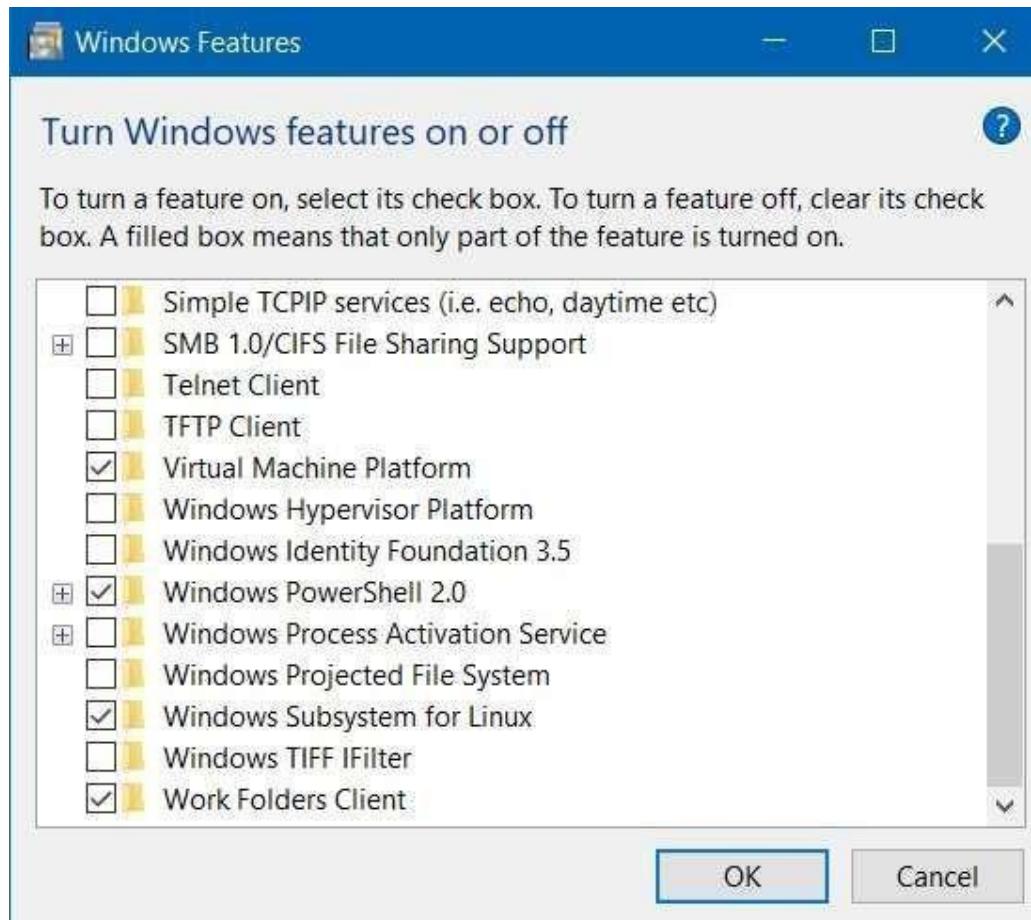
Open the .exe file and follow the steps after clicking install button.



Step-III

Once installed go to programs and features and click turn on windows features on or off

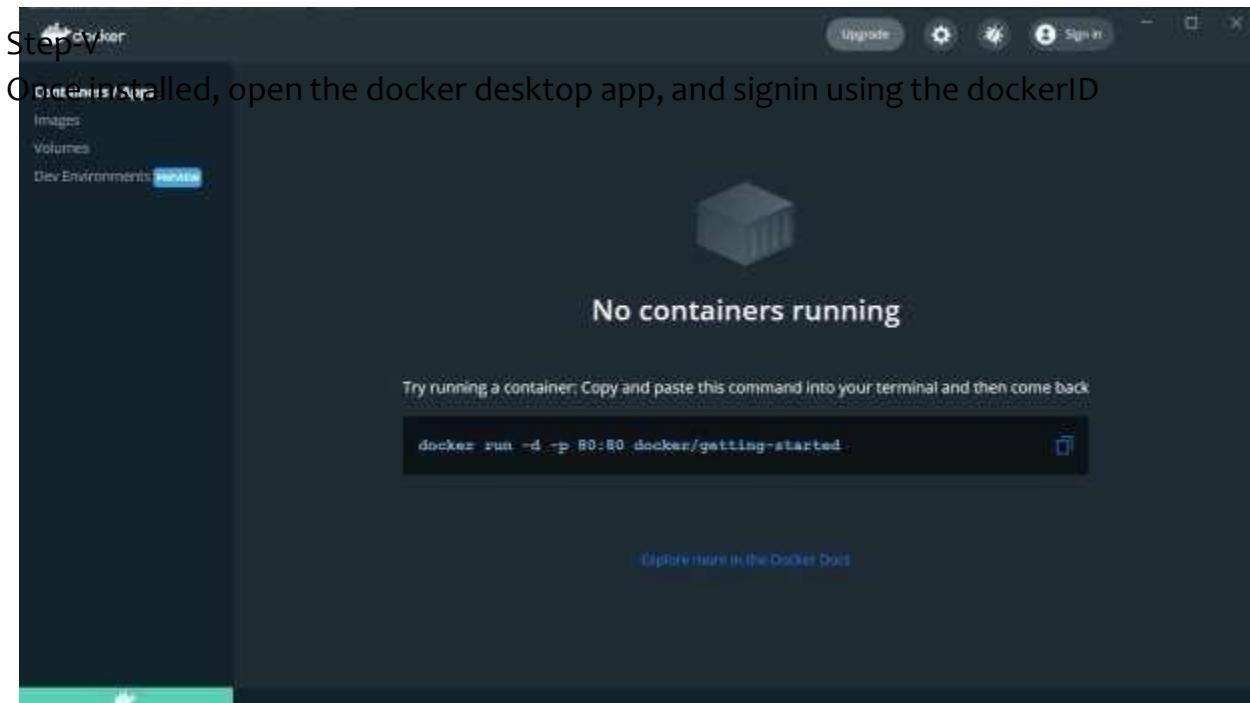
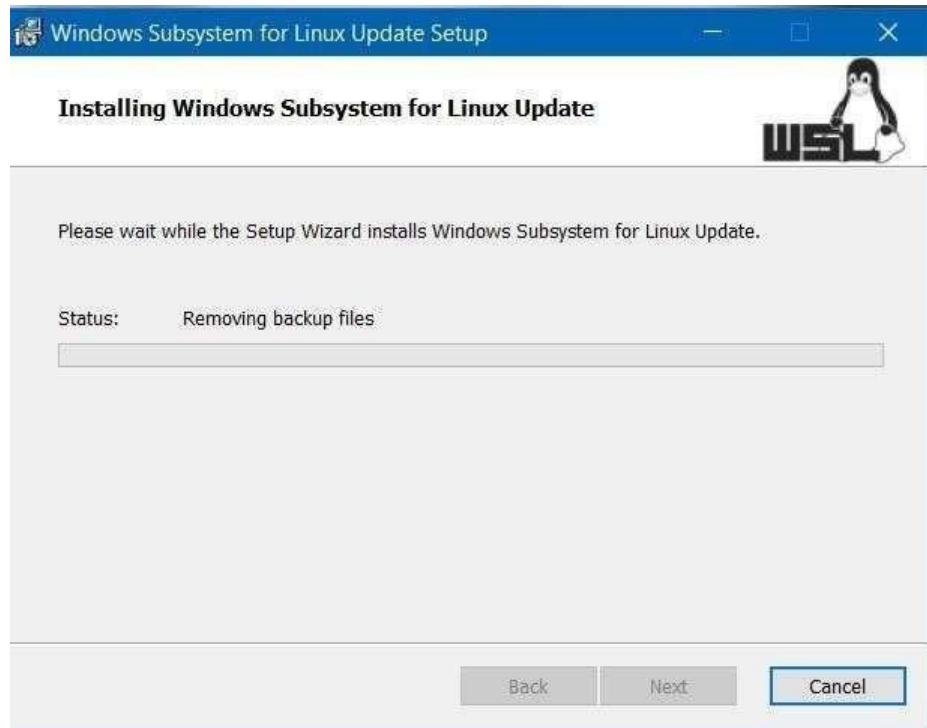
Scroll to the bottom and select windows subsystem for Linux



Step-IV

If any WSL 2 error occurs download windows subsystem for linux update package and install the .exe file, after the installation restart the windows device.

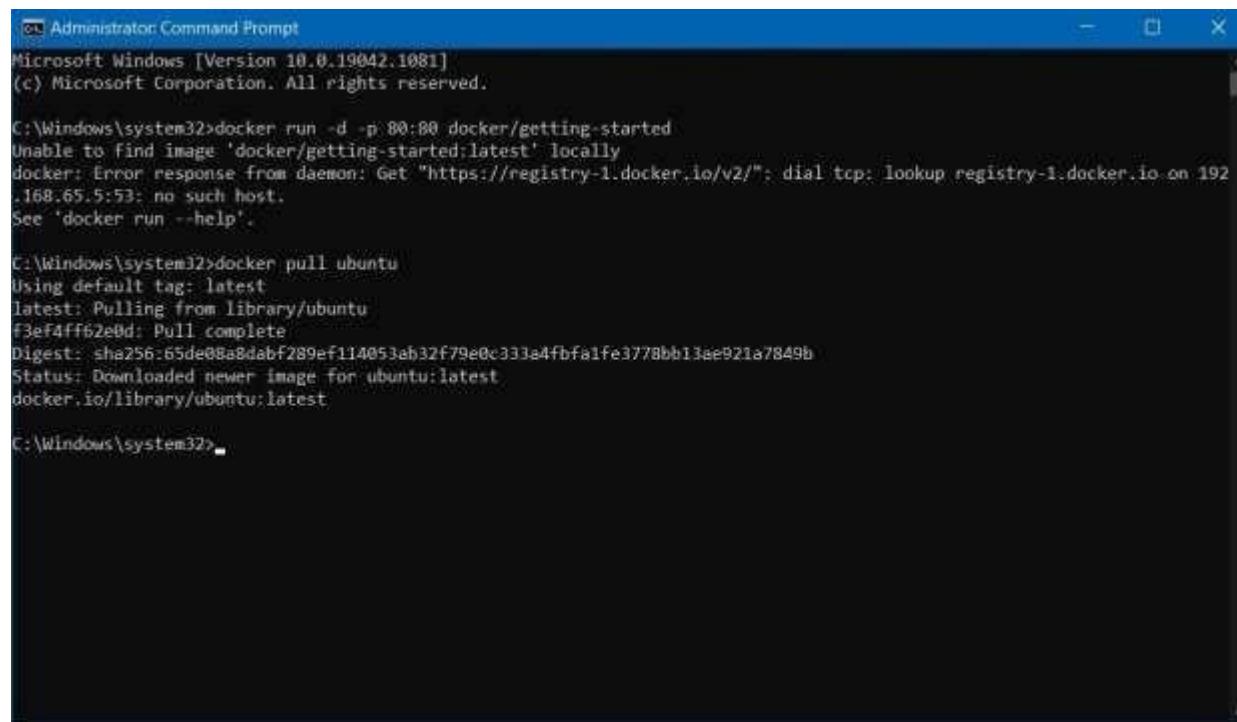
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Step-VI

Now pull any image from docker hub using the docker pull command in the command prompt (eg: docker pull ubuntu)

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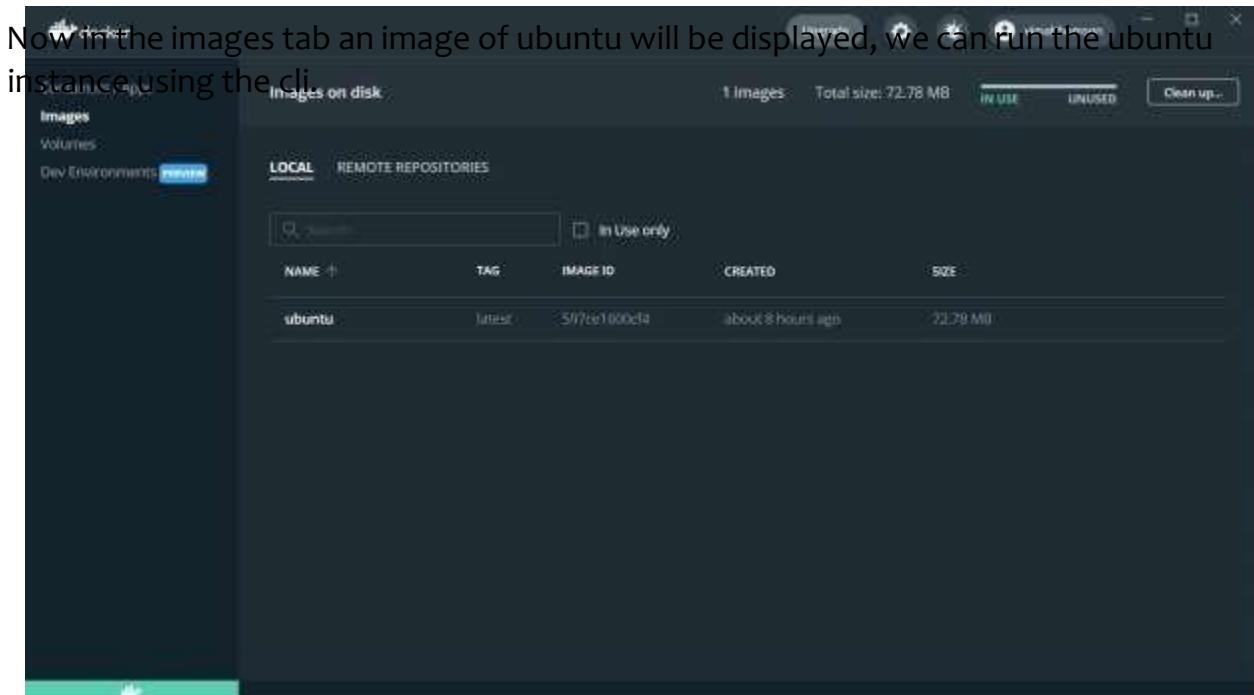


Administrator: Command Prompt
Microsoft Windows [Version 10.0.19042.1081]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\system32>docker run -d -p 80:80 docker/getting-started
Unable to find image 'docker/getting-started:latest' locally
docker: Error response from daemon: Get "https://registry-1.docker.io/v2/": dial tcp: lookup registry-1.docker.io on 192.168.65.53: no such host.
See 'docker run --help'.

C:\Windows\system32>docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
F3ef4ff62e0d: Pull complete
Digest: sha256:65de08a8dabf289ef114053eb32f79e0c333a4fbfa1fe3778bb13ae921a7849b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

C:\Windows\system32>



8.Wireshark installation

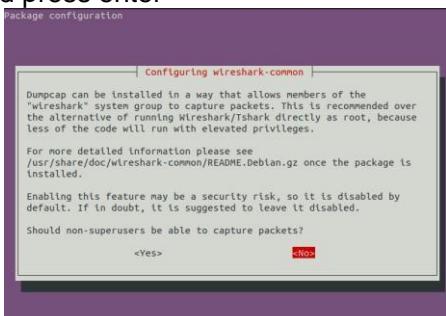
1. Command: sudo apt-get install wireshark

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo apt-get install wireshark
[sudo] password for sangeetha:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5
  libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins
  libqt5multimedagsttools libqt5multimediawidgets5 libqt5networks
  libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l2db1
  libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13
  libwiretap10 libwsutil11 libxcb-xinerama libxcb-xinput0
  qt5-gtk-platformtheme qtrtranslati0n5-l10n wireshark-common wireshark-qt
Suggested packages:
  qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geopipupdate
  geoip-database geoip-database-extra libjs-leaflet
  libjs-leaflet.markercluster wireshark-doc
The following NEW packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5
  libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins
  libqt5multimedagsttools libqt5multimediawidgets5 libqt5networks
  libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l2db1
  libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13
  libwiretap10 libwsutil11 libxcb-xinerama libxcb-xinput0
  qt5-gtk-platformtheme qtrtranslati0n5-l10n wireshark wireshark-common
  wireshark-qt
0 upgraded, 30 newly installed, 0 to remove and 334 not upgraded.
Need to get 32.8 MB of archives.
After this operation, 163 MB of additional disk space will be used.
```

2. Command: sudo dpkg-reconfigure wireshark-common

```
sangeetha@sangeetha-VirtualBox:~/Desktop$ sudo dpkg-reconfigure wireshark-commo
n
sangeetha@sangeetha-VirtualBox:~/Desktop$
```

3. Command: Select Yes and press enter



4. open wireshark from the applist

