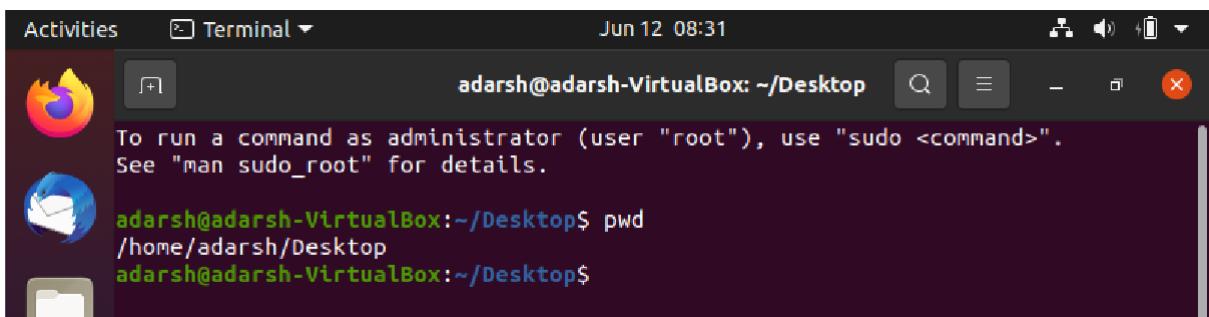


## LINUX COMMANDS

### pwd(print working directory)

print name of current/working directory

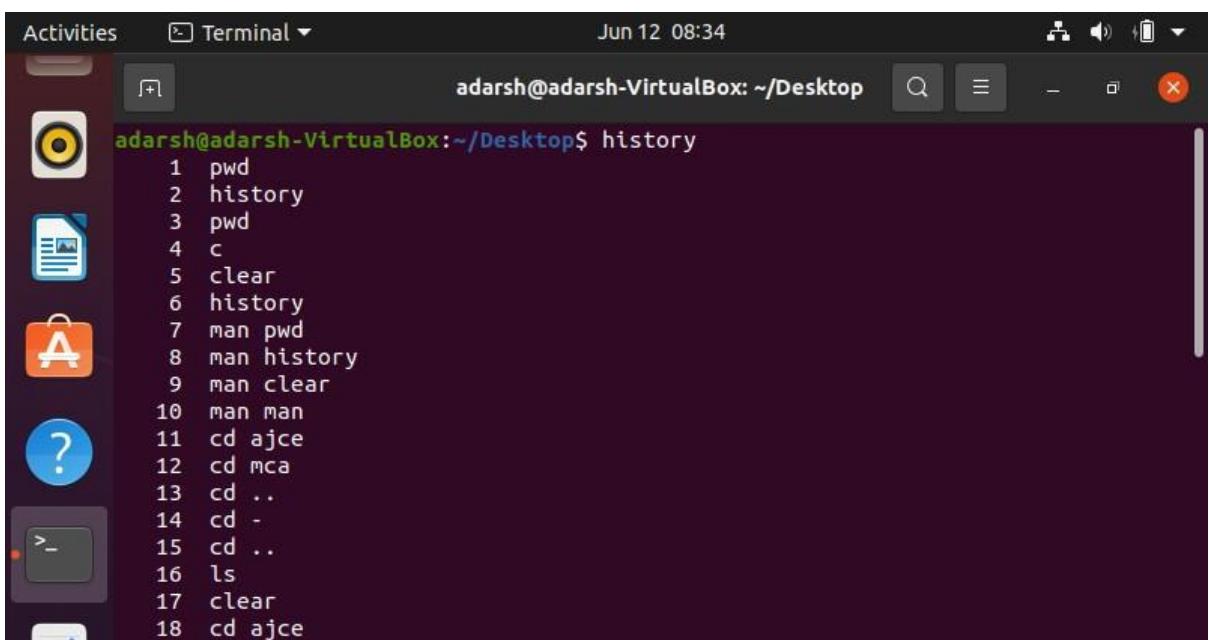


A screenshot of a Linux desktop environment showing a terminal window. The terminal window is titled "Terminal" and has the status bar showing "Jun 12 08:31". The command "pwd" is run, and the output is "/home/adarsh/Desktop".

```
Activities Terminal Jun 12 08:31
adarsh@adarsh-VirtualBox: ~/Desktop
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
adarsh@adarsh-VirtualBox:~/Desktop$ pwd
/home/adarsh/Desktop
adarsh@adarsh-VirtualBox:~/Desktop$
```

### history

Many programs read input from the user a line at a time. The GNU History library is able to keep track of those lines, associate arbitrary data with each line, and utilize information from previous lines in composing new ones.

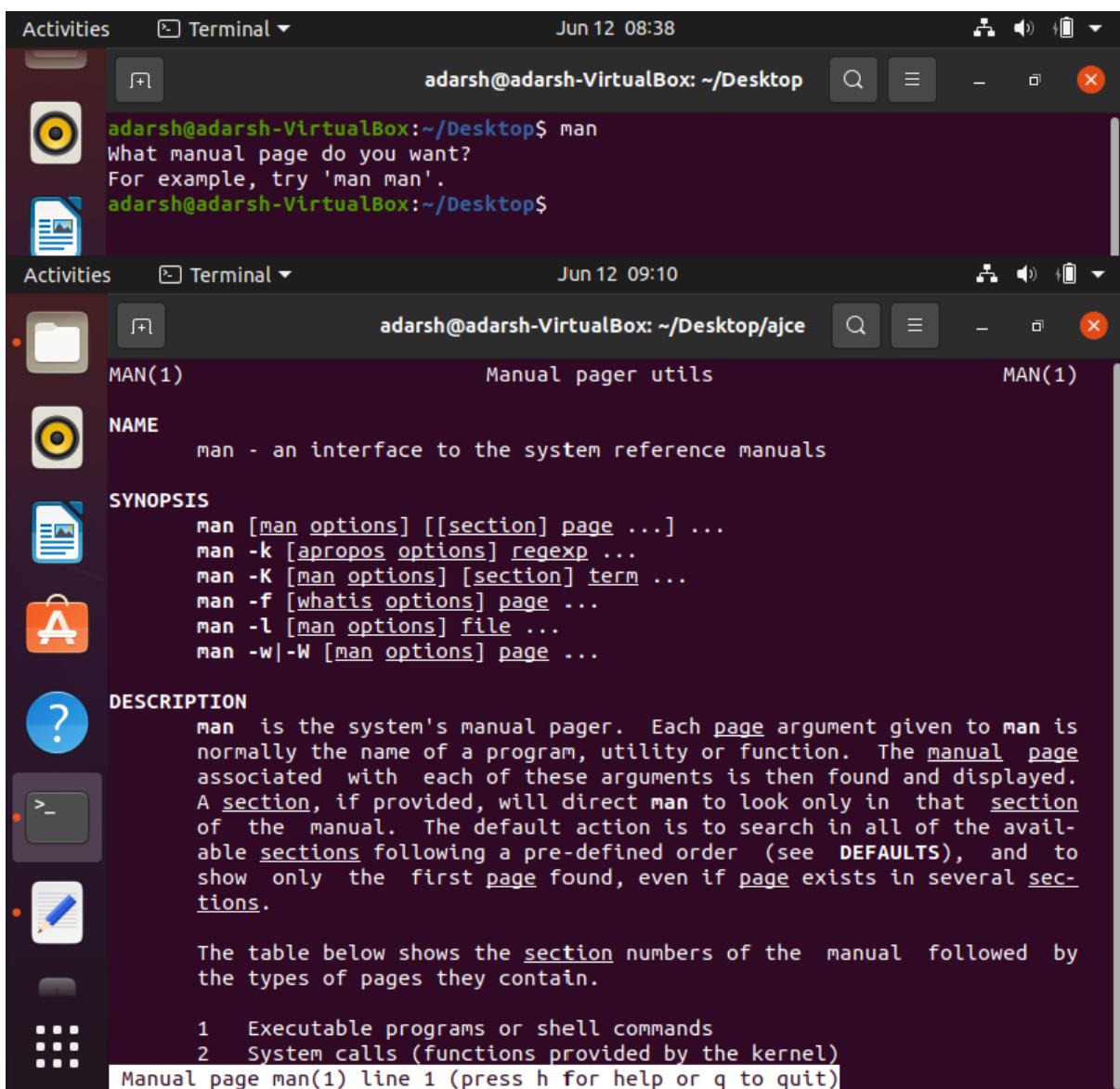


A screenshot of a Linux desktop environment showing a terminal window. The terminal window is titled "Terminal" and has the status bar showing "Jun 12 08:34". The command "history" is run, and the output shows a list of 18 previous commands entered in the terminal.

```
Activities Terminal Jun 12 08:34
adarsh@adarsh-VirtualBox: ~/Desktop
adarsh@adarsh-VirtualBox:~/Desktop$ history
1  pwd
2  history
3  pwd
4  c
5  clear
6  history
7  man pwd
8  man history
9  man clear
10 man man
11 cd ajce
12 cd mca
13 cd ..
14 cd -
15 cd ..
16 ls
17 clear
18 cd ajce
```

## Man

man is the system's manual pager. Each page argument given to man is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct man to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see **DEFAULTS**), and to show only the first page found, even if page exists in several sections.



Activities Terminal Jun 12 08:38 adarsh@adarsh-VirtualBox: ~/Desktop\$ man What manual page do you want? For example, try 'man man'. adarsh@adarsh-VirtualBox:~/Desktop\$

Activities Terminal Jun 12 09:10 adarsh@adarsh-VirtualBox: ~/Desktop/ajce Jun 12 09:10 adarsh@adarsh-VirtualBox: ~/Desktop/ajce

**MAN(1)** Manual pager utils **MAN(1)**

**NAME**  
man - an interface to the system reference manuals

**SYNOPSIS**

```
man [man options] [[section] page ...] ...
man -k [apropos options] regexp ...
man -K [man options] [section] term ...
man -f [whatis options] page ...
man -l [man options] file ...
man -w|-W [man options] page ...
```

**DESCRIPTION**

**man** is the system's manual pager. Each page argument given to **man** is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct **man** to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see **DEFAULTS**), and to show only the first page found, even if page exists in several sections.

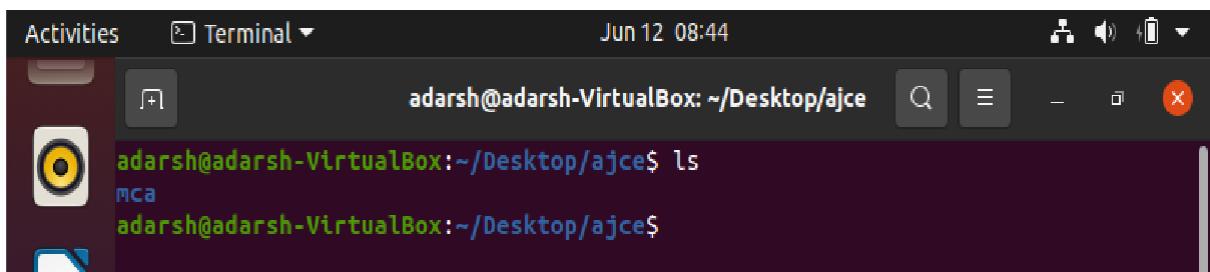
The table below shows the section numbers of the manual followed by the types of pages they contain.

1	Executable programs or shell commands
2	System calls (functions provided by the kernel)

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

## ls

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



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal". The date and time are "Jun 12 08:44". The user is at the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce\$". The user types "ls" and presses Enter. The terminal displays two files: "mca" and "mca". The terminal window has a dark background with light-colored text and standard window controls.

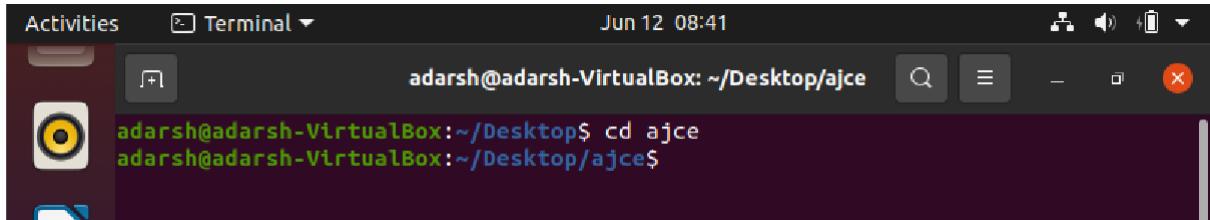
```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ ls
mca
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```

## cd

cd command is used to change directory

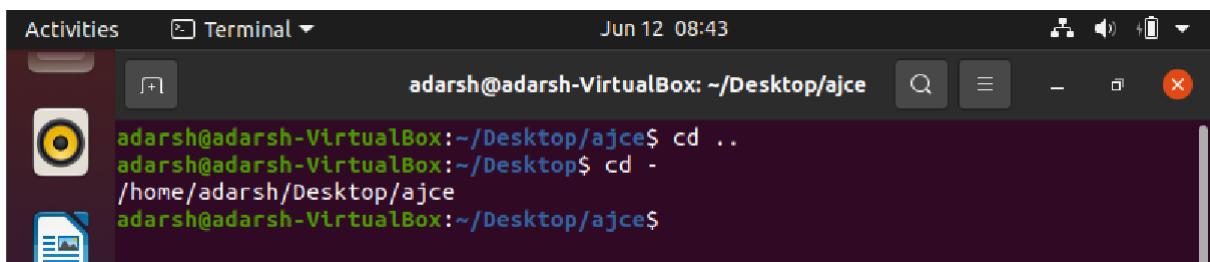
cd .. is used to go back to the directory

cd - is used to go forward to the directory.



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal". The date and time are "Jun 12 08:41". The user is at the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce\$". The user types "cd ajce" and presses Enter. The terminal shows the user has moved to the "ajce" directory. The terminal window has a dark background with light-colored text and standard window controls.

```
adarsh@adarsh-VirtualBox:~/Desktop$ cd ajce
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```

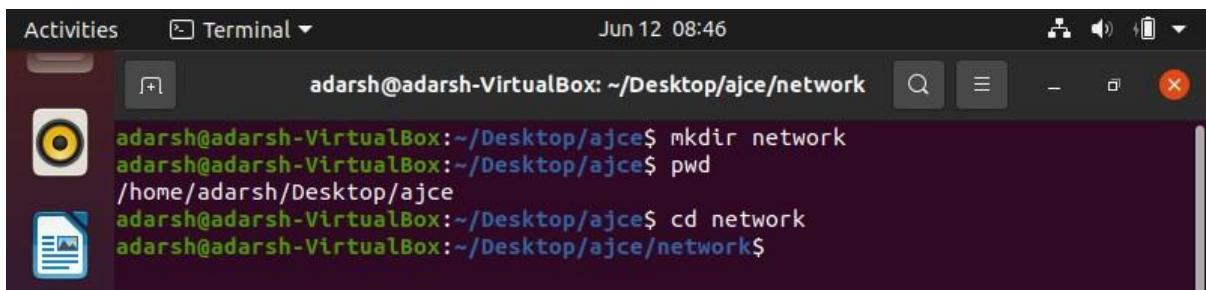


A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal". The date and time are "Jun 12 08:43". The user is at the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce\$". The user types "cd .." and presses Enter. The terminal shows the user has moved up one directory level. Then the user types "cd -" and presses Enter. The terminal shows the user has moved back to the previous directory ("ajce"). The terminal window has a dark background with light-colored text and standard window controls.

```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cd ..
adarsh@adarsh-VirtualBox:~/Desktop$ cd -
/home/adarsh/Desktop/ajce
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```

## mkdir

Create the DIRECTORY(ies), if they do not already exist.

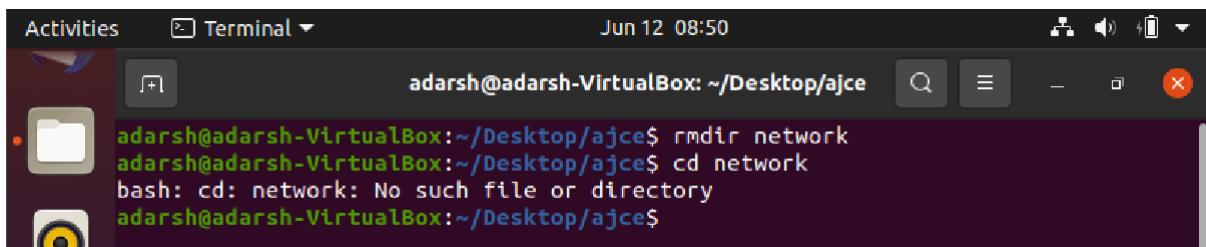


A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal" and the date and time are "Jun 12 08:46". The user is at the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce/network". The user runs the command "mkdir network". The terminal shows the command, its output ("network" directory created), the user's current directory ("~/Desktop/ajce"), and the user switching to the "network" directory. The terminal has a dark background with light-colored text and standard Linux icons in the title bar.

```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ mkdir network
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ pwd
/home/adarsh/Desktop/ajce
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cd network
adarsh@adarsh-VirtualBox:~/Desktop/ajce/network$
```

## rmdir

Remove the DIRECTORY(ies), if they are empty.

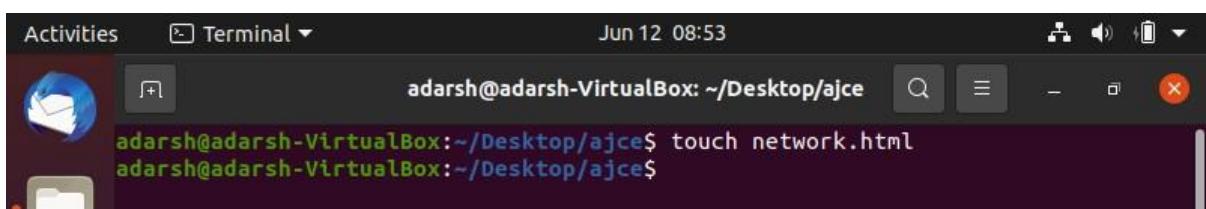


A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal" and the date and time are "Jun 12 08:50". The user is at the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce". The user runs the command "rmdir network". The terminal shows the command, its output ("network" directory removed), the user's current directory ("~/Desktop/ajce"), and the user switching to the "network" directory. The terminal has a dark background with light-colored text and standard Linux icons in the title bar.

```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ rmdir network
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cd network
bash: cd: network: No such file or directory
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```

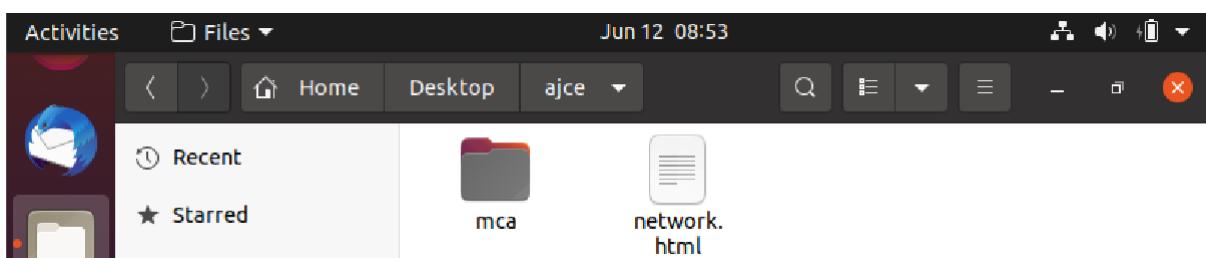
## touch

Update the access and modification times of each FILE to the current time.



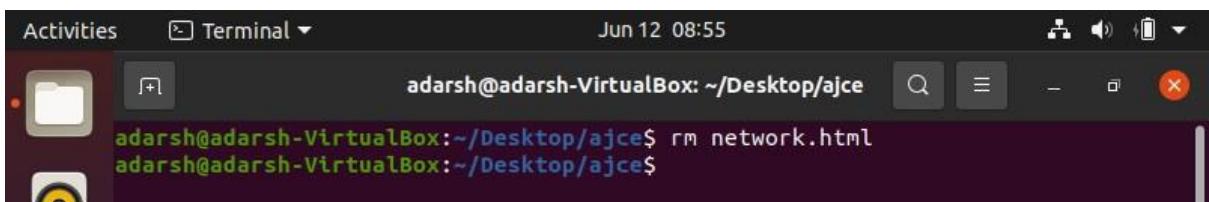
A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal" and the date and time are "Jun 12 08:53". The user is at the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce". The user runs the command "touch network.html". The terminal shows the command and its output ("network.html" file updated). The terminal has a dark background with light-colored text and standard Linux icons in the title bar.

```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ touch network.html
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```

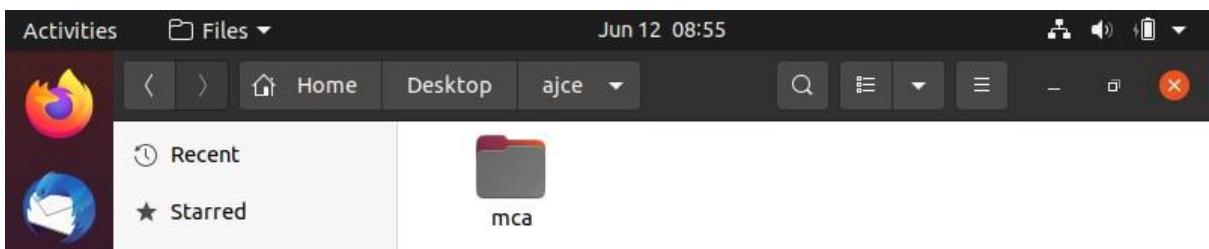


## rm

This manual page documents the GNU version of rm. rm removes each specified file. By default, it does not remove directories.

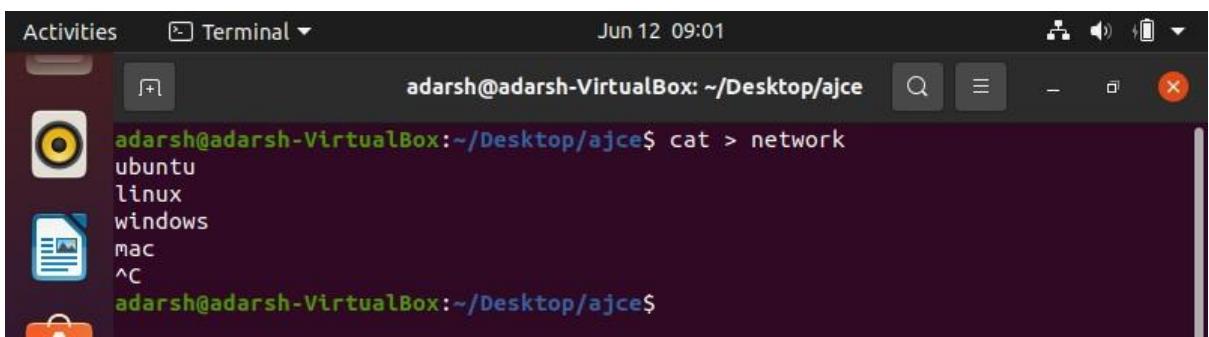


A screenshot of a terminal window titled "Terminal". The window shows a command-line interface with the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce\$". The user has run the command "rm network.html", which is displayed in green text. The terminal window has a dark background and includes standard Linux desktop icons in the top bar.

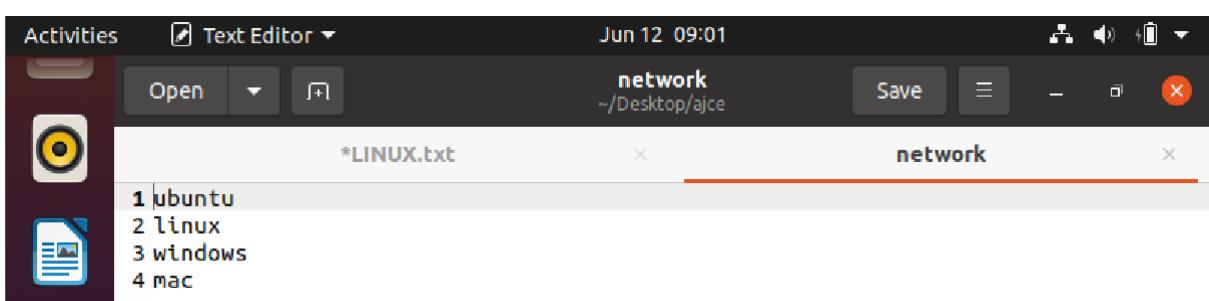


## cat

cat - concatenate files and print on the standard output

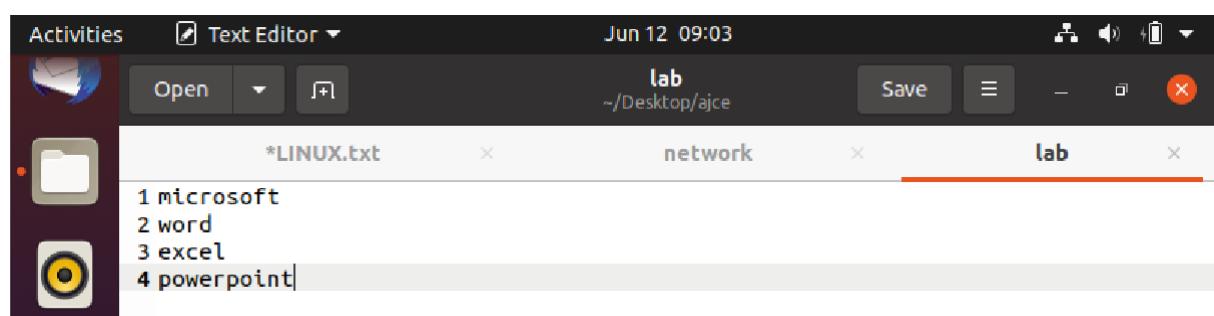


A screenshot of a terminal window titled "Terminal". The window shows a command-line interface with the prompt "adarsh@adarsh-VirtualBox: ~/Desktop/ajce\$". The user has run the command "cat > network", followed by the text "ubuntu", "linux", "windows", "mac", and then ^C to cancel the command. The terminal window has a dark background and includes standard Linux desktop icons in the top bar.



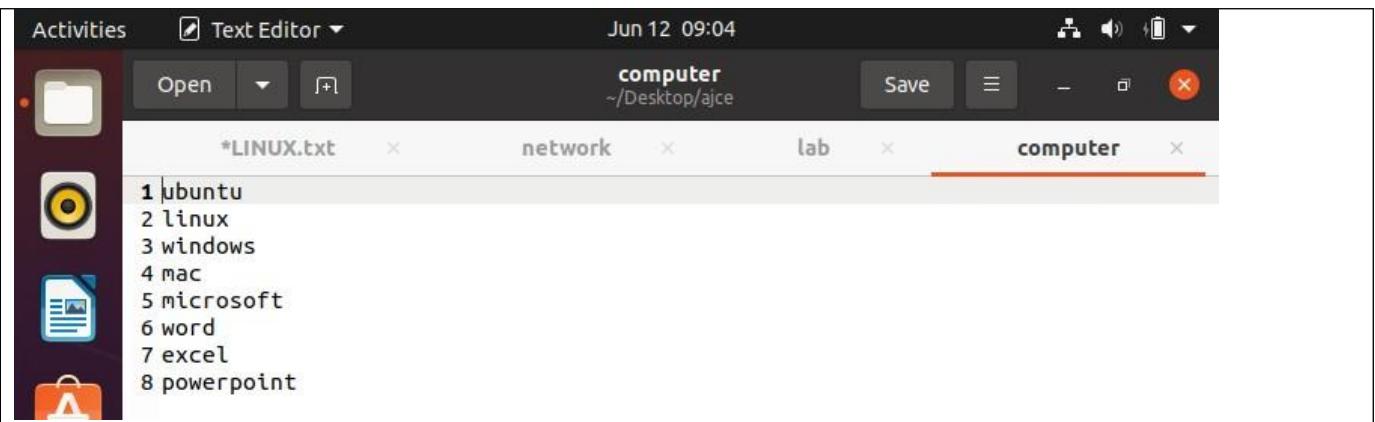
Activities Terminal Jun 12 09:03

```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cat > network
ubuntu
linux
windows
mac
^C
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cat > lab
microsoft
word
excel
powerpoint
^C
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```



Activities Terminal Jun 12 09:04

```
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cat > network
ubuntu
linux
windows
mac
^C
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cat > lab
microsoft
word
excel
powerpoint
^C
adarsh@adarsh-VirtualBox:~/Desktop/ajce$ cat network lab>computer
adarsh@adarsh-VirtualBox:~/Desktop/ajce$
```



Activities Terminal Jun 12 09:06

adarsh@adarsh-VirtualBox:~/Desktop/ajce\$ cat > network

ubuntu  
linux  
windows  
mac  
^C

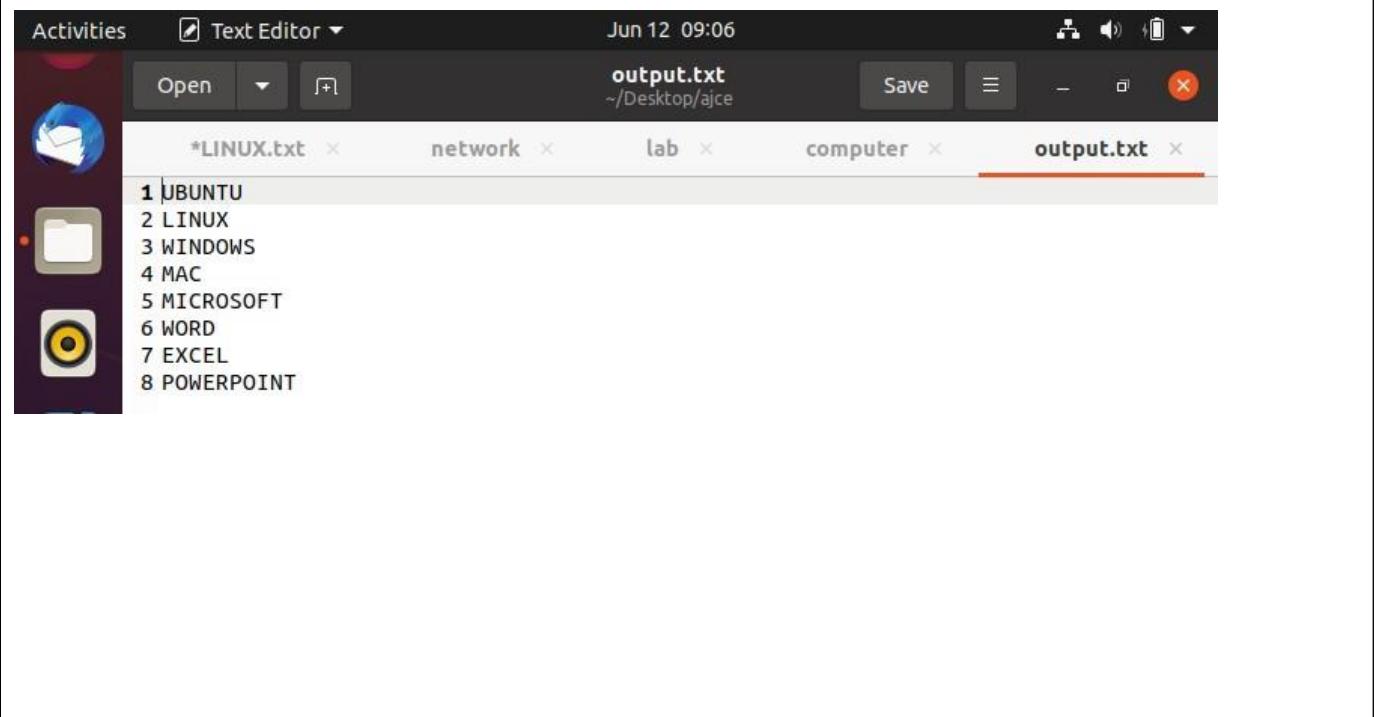
adarsh@adarsh-VirtualBox:~/Desktop/ajce\$ cat > lab

microsoft  
word  
excel  
powerpoint  
^C

adarsh@adarsh-VirtualBox:~/Desktop/ajce\$ cat network lab>computer

adarsh@adarsh-VirtualBox:~/Desktop/ajce\$ cat computer | tr a-z A-Z>output.txt

adarsh@adarsh-VirtualBox:~/Desktop/ajce\$



# **ASSIGNMENT-2**

**Subject :** Networking & System Administration Lab

**Submitted To :**

Assistant Professor Rini Kurian

**Submitted by:**

Adarsh S

S2RMCA A Batch  
Roll No: 03

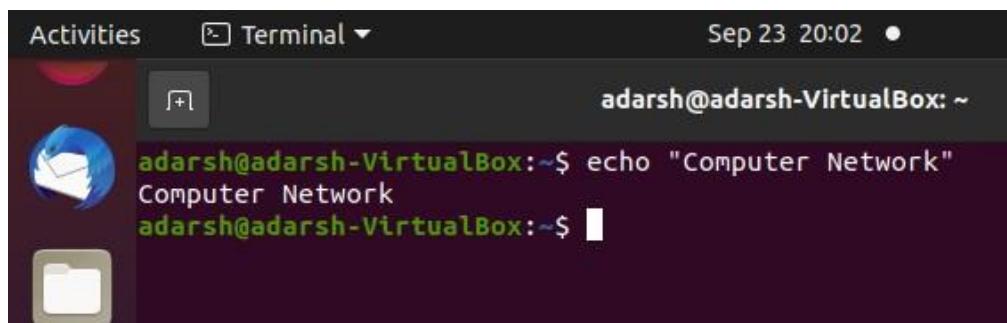
# **NETWORKING & SYSTEM ADMINISTRATION LAB ASSIGNMENT (LINUX COMMANDS)**

Basic Linux Commands Explain Linux Commands with Examples

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

## **echo**

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..

A screenshot of a Linux desktop environment. At the top, there's a dark header bar with the text "Activities", "Terminal", and the date "Sep 23 20:02". Below the header is a dock with icons for a file browser, a terminal, and other applications. The main area shows a terminal window titled "adarsh@adarsh-VirtualBox: ~". Inside the terminal, the command "echo "Computer Network"" is entered and executed, displaying the output "Computer Network".

```
adarsh@adarsh-VirtualBox:~$ echo "Computer Network"
Computer Network
adarsh@adarsh-VirtualBox:~$
```

## **head**

The head command, as the name implies, print the top N number of data of the given input. By default, it prints the first 10 lines of the specified files. If more than one file name is provided then data from each file is preceded by its file name.

Activities Terminal Sep 23 20:09

```
adarsh@adarsh-VirtualBox:~$ cat state.txt
Andra Pradesh
kerala
Assam
Gujarath
Rajasthan
Jammu and Kashmir
Sikkim
Himachal Pradesh
adarsh@adarsh-VirtualBox:~$ head -n 5 state.txt
Andra Pradesh
kerala
Assam
Gujarath
Rajasthan
adarsh@adarsh-VirtualBox:~$ head -c 6 state.txt
Andra adarsh@adarsh-VirtualBox:~$ head state.txt
Andra Pradesh
kerala
Assam
Gujarath
Rajasthan
Jammu and Kashmir
Sikkim
Himachal Pradesh
adarsh@adarsh-VirtualBox:~$
```

## Tail

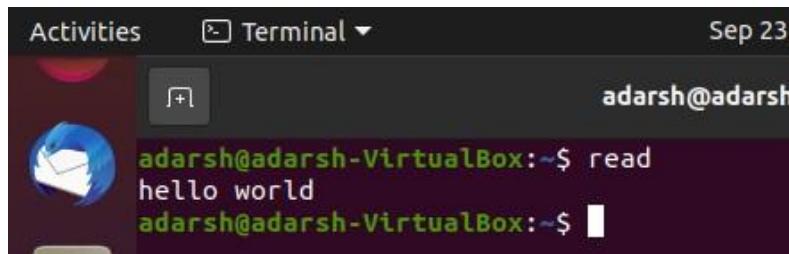
The tail command, as the name implies, print the last N number of data of the given input. By default it prints the last 10 lines of the specified files. If more than one file name is provided then data from each file is preceded by its file name.

Activities Terminal Sep 23 20:12

```
adarsh@adarsh-VirtualBox:~$ cat state.txt
Andra Pradesh
kerala
Assam
Gujarath
Rajasthan
Jammu and Kashmir
Sikkim
Himachal Pradesh
adarsh@adarsh-VirtualBox:~$ tail -n 3 state.txt
Jammu and Kashmir
Sikkim
Himachal Pradesh
adarsh@adarsh-VirtualBox:~$ tail -c 6 state.txt
adesh
adarsh@adarsh-VirtualBox:~$
```

## read

**read command** in Linux system is used to read from a file descriptor. Basically, this command read up the total number of bytes from the specified file descriptor into the buffer. If the number or count is zero then this command may detect the errors. But on success, it returns the number of bytes read. Zero indicates the end of the file. If some errors found then it returns -1.

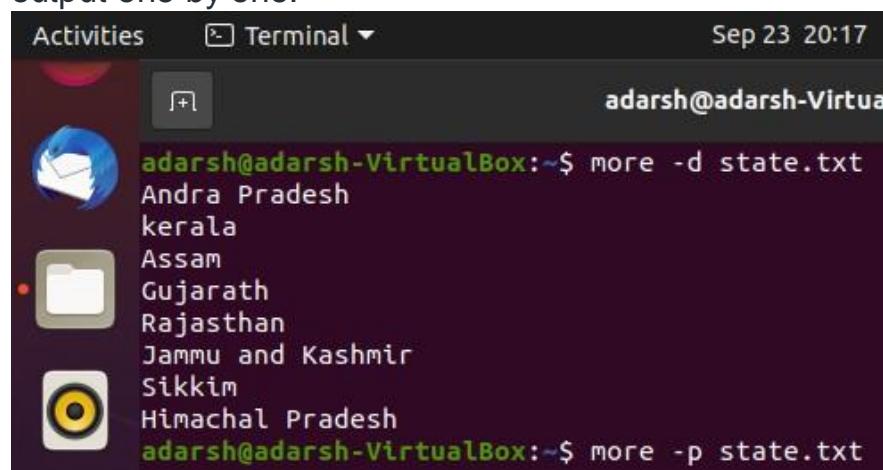


A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal". The date "Sep 23" is visible at the top right. The terminal prompt is "adarsh@adarsh". The user types "read hello world" and presses Enter. The output shows "hello world" followed by a new line. The terminal prompt "adarsh@adarsh-VirtualBox:" is shown again.

```
adarsh@adarsh-VirtualBox:~$ read
hello world
adarsh@adarsh-VirtualBox:~$
```

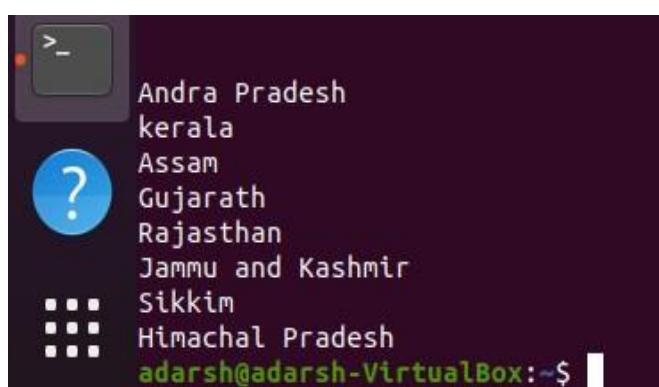
## More

**more** command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large (For example log files). The more command also allows the user do scroll up and down through the page. The syntax along with options and command is as follows. Another application of more is to use it with some other command after a [pipe](#). When the output is large, we can use more command to see output one by one.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal". The date "Sep 23 20:17" is visible at the top right. The terminal prompt is "adarsh@adarsh-VirtualBox". The user types "more -d state.txt" and presses Enter. The terminal displays a list of Indian states: Andra Pradesh, kerala, Assam, Gujarat, Rajasthan, Jammu and Kashmir, Sikkim, and Himachal Pradesh. The terminal prompt "adarsh@adarsh-VirtualBox:" is shown again.

```
adarsh@adarsh-VirtualBox:~$ more -d state.txt
Andra Pradesh
kerala
Assam
Gujarath
Rajasthan
Jammu and Kashmir
Sikkim
Himachal Pradesh
adarsh@adarsh-VirtualBox:~$
```



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal". The terminal prompt is "adarsh@adarsh-VirtualBox". The user types "more -p state.txt" and presses Enter. The terminal displays the same list of Indian states as the previous command. The terminal prompt "adarsh@adarsh-VirtualBox:" is shown again.

```
adarsh@adarsh-VirtualBox:~$ more -p state.txt
Andra Pradesh
kerala
Assam
Gujarath
Rajasthan
Jammu and Kashmir
Sikkim
Himachal Pradesh
adarsh@adarsh-VirtualBox:~$
```

## less

Less command is linux utility which can be used to read contents of text file one page(one screen) per time. It has faster access because if file is large, it don't access complete file, but access it page by page.

For example, if it's a large file and you are reading it using any text editor, then the complete file will be loaded to main memory, but less command don't load entire file, but load it part by part, which makes it faster.



## cut

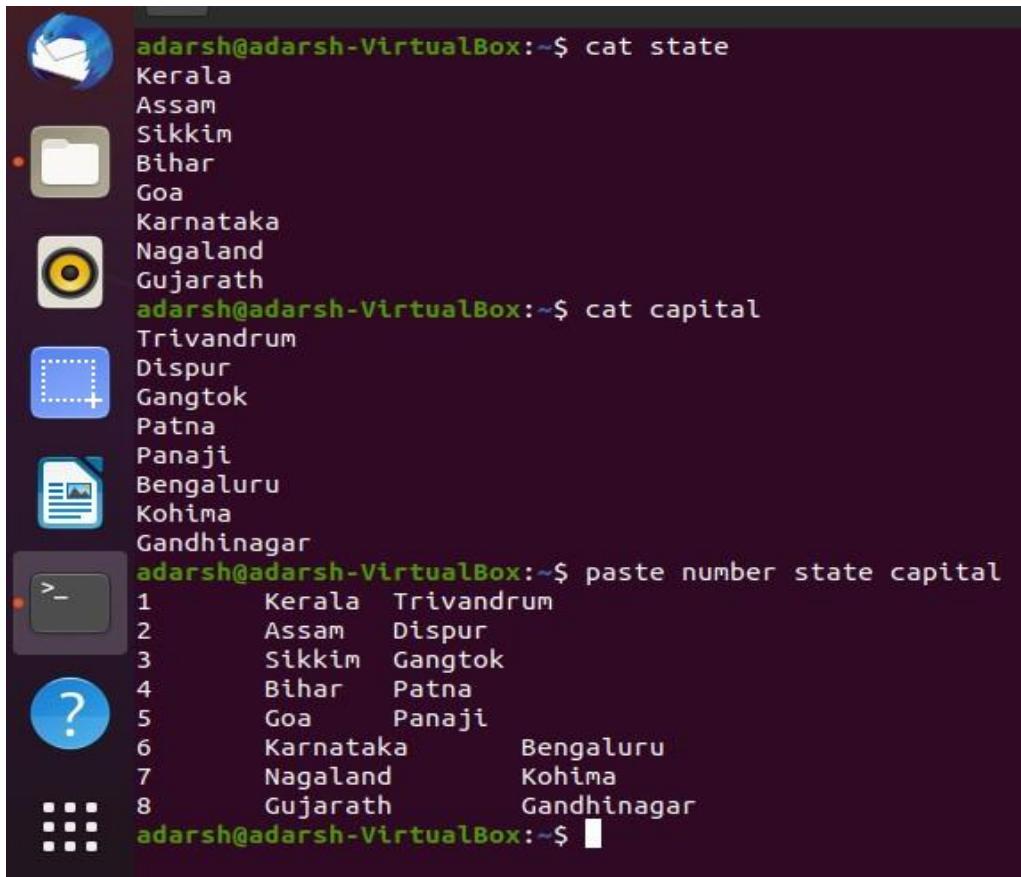
The cut command in UNIX is a command for cutting out the sections from each line of files and writing the result to standard output. It can be used to cut parts of a line by **byteposition, character and field**.

Basically the cut command slices a line and extracts the text. It is necessary to specify option with command otherwise it gives error. If more than one file name is provided then data from each file is **not precedes** by its file name

A screenshot of a Linux desktop environment showing the terminal window. The terminal window displays the output of the 'cat' command followed by the 'cut' command. The 'cat' command shows the content of 'state.txt' which lists Indian states. The first 'cut' command, 'cut -b 1,2,3 state.txt', outputs the first three characters of each state name: And, ker, Ass, Guj, Raj, Jam, Sik, and Him. The second 'cut' command, 'cut -b 1,-3,5,-7 state.txt', outputs specific characters from each state name based on byte positions: Andra P, kerala, Assam, Gujarat, Rajasth, Jammu a, Sikkim, and Himacha. The terminal window is titled 'Terminal' and is part of the 'Activities' overview screen. The desktop background is dark.

## paste

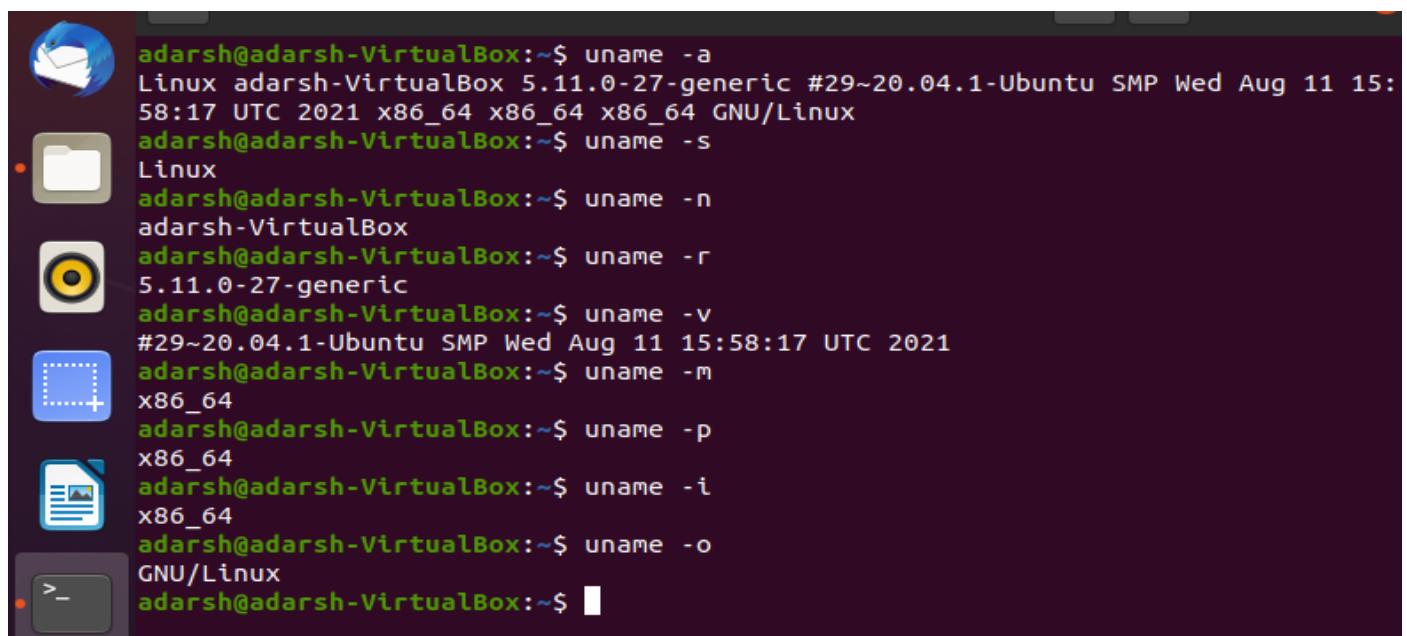
Paste command is one of the useful commands in Unix or Linux operating system. It is used to join files horizontally (parallel merging) by outputting lines consisting of lines from each file specified, separated by **tab** as delimiter, to the standard output. When no file is specified, or put dash ("–") instead of file name, paste reads from standard input and gives output as it is until a interrupt command [**Ctrl-c**] is given.



```
adarsh@adarsh-VirtualBox:~$ cat state
Kerala
Assam
Sikkim
Bihar
Goa
Karnataka
Nagaland
Gujarath
adarsh@adarsh-VirtualBox:~$ cat capital
Trivandrum
Dispur
Gangtok
Patna
Panaji
Bengaluru
Kohima
Gandhinagar
adarsh@adarsh-VirtualBox:~$ paste number state capital
1      Kerala   Trivandrum
2      Assam    Dispur
3      Sikkim   Gangtok
4      Bihar    Patna
5      Goa     Panaji
6      Karnataka Bengaluru
7      Nagaland Kohima
8      Gujarat  Gandhinagar
adarsh@adarsh-VirtualBox:~$
```

## uname

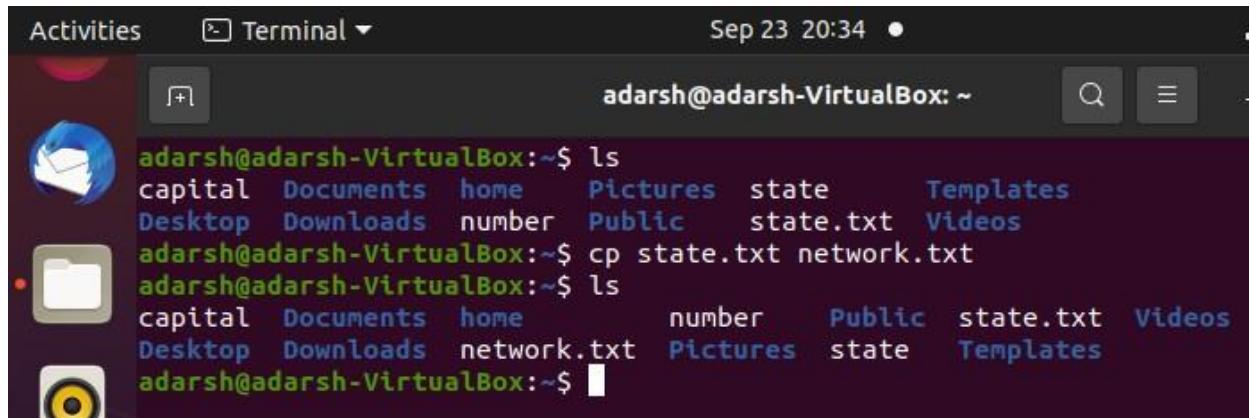
The command ‘uname’ displays the information about the system.



```
adarsh@adarsh-VirtualBox:~$ uname -a
Linux adarsh-VirtualBox 5.11.0-27-generic #29~20.04.1-Ubuntu SMP Wed Aug 11 15:
58:17 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
adarsh@adarsh-VirtualBox:~$ uname -s
Linux
adarsh@adarsh-VirtualBox:~$ uname -n
adarsh-VirtualBox
adarsh@adarsh-VirtualBox:~$ uname -r
5.11.0-27-generic
adarsh@adarsh-VirtualBox:~$ uname -v
#29~20.04.1-Ubuntu SMP Wed Aug 11 15:58:17 UTC 2021
adarsh@adarsh-VirtualBox:~$ uname -m
x86_64
adarsh@adarsh-VirtualBox:~$ uname -p
x86_64
adarsh@adarsh-VirtualBox:~$ uname -i
x86_64
adarsh@adarsh-VirtualBox:~$ uname -o
GNU/Linux
adarsh@adarsh-VirtualBox:~$
```

## Cp

**cp** stands for **copy**. This command is used to copy files or group of files or directory. It creates an exact image of a file on a disk with different file name. **cp** command require at least two filenames in its arguments



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title bar says "Terminal". The terminal window shows the following command-line session:

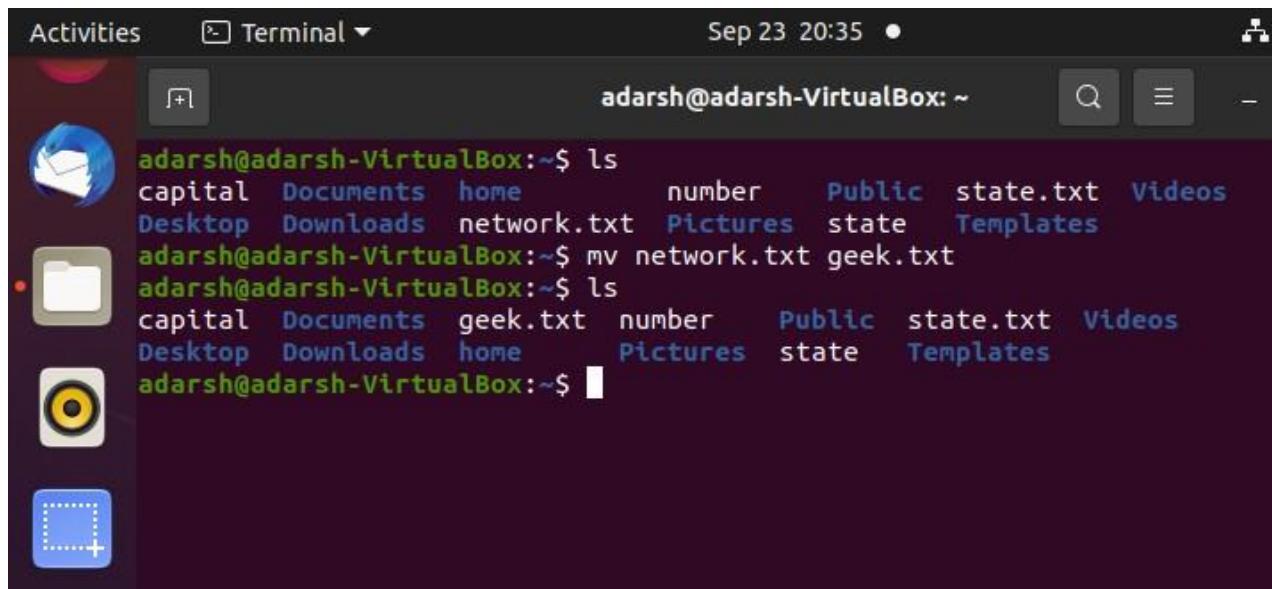
```
adarsh@adarsh-VirtualBox:~$ ls
capital Documents home Pictures state Templates
Desktop Downloads number Public state.txt Videos
adarsh@adarsh-VirtualBox:~$ cp state.txt network.txt
adarsh@adarsh-VirtualBox:~$ ls
capital Documents home number Public state.txt Videos
Desktop Downloads network.txt Pictures state Templates
adarsh@adarsh-VirtualBox:~$
```

## Mv

**mv** stands for **move**. **mv** is used to move one or more files or directories from one place to another in a file system like UNIX. It has two distinct functions:

- (i) It renames a file or folder.
- (ii) It moves a group of files to a different directory.

No additional space is consumed on a disk during renaming. This command normally **works silently** means no prompt for confirmation.

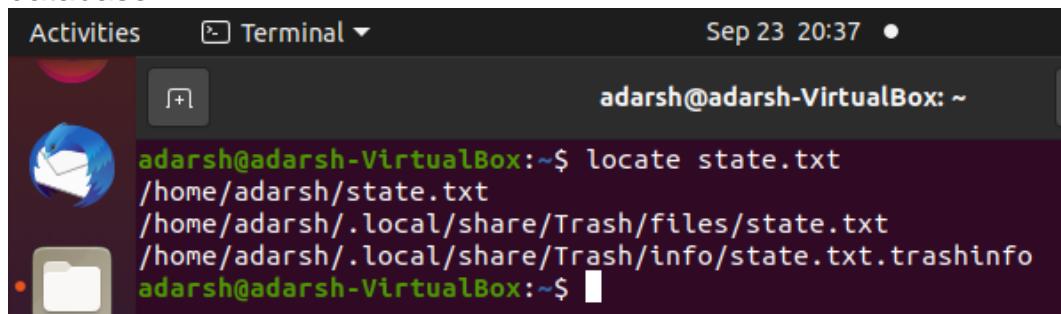


A screenshot of a Linux desktop environment showing a terminal window. The terminal window title bar says "Terminal". The terminal window shows the following command-line session:

```
adarsh@adarsh-VirtualBox:~$ ls
capital Documents home number Public state.txt Videos
Desktop Downloads network.txt Pictures state Templates
adarsh@adarsh-VirtualBox:~$ mv network.txt geek.txt
adarsh@adarsh-VirtualBox:~$ ls
capital Documents geek.txt number Public state.txt Videos
Desktop Downloads home Pictures state Templates
adarsh@adarsh-VirtualBox:~$
```

## Locate

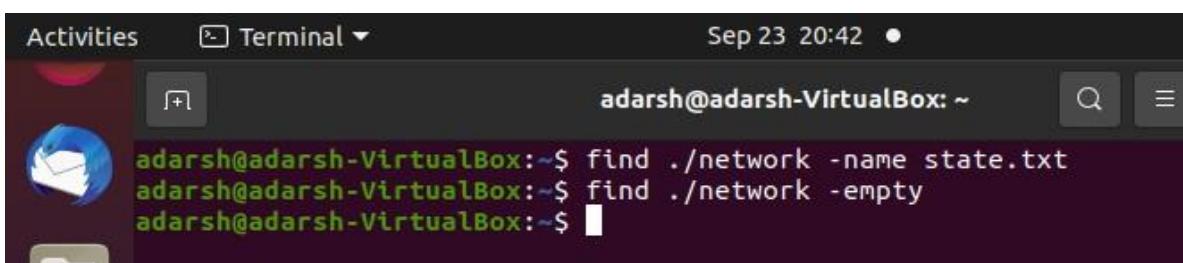
*locate* command in Linux is used to find the files by name. There are two most widely used file searching utilities accessible to users called *find* and *locate*. The *locate* utility works better and faster than *find* command counterpart because instead of searching the file system when a file search is initiated, it would look through a database. This database contains bits and parts of files and their corresponding paths on your system. By default, *locate* command does not check whether the files found in the database still exist and it never reports files created after the most recent update of the relevant database.



```
Activities Terminal Sep 23 20:37
adarsh@adarsh-VirtualBox:~$ locate state.txt
/home/adarsh/state.txt
/home/adarsh/.local/share/Trash/files/state.txt
/home/adarsh/.local/share/Trash/info/state.txt.trashinfo
adarsh@adarsh-VirtualBox:~$
```

## Find

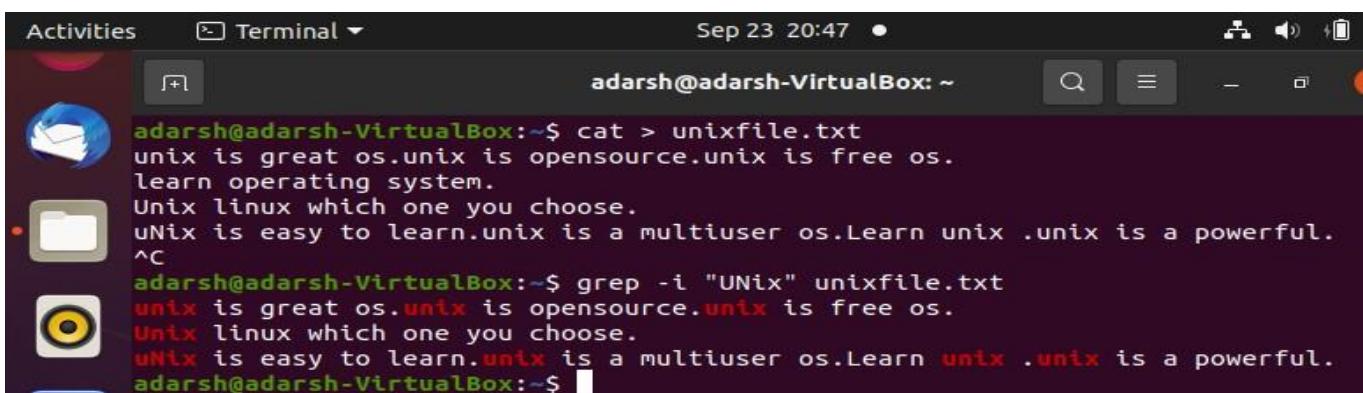
The **find** command in UNIX is a command line utility for walking a file hierarchy. It can be used to find files and directories and perform subsequent operations on them. It supports searching by file, folder, name, creation date, modification date, owner and permissions. By using the ‘-exec’ other UNIX commands can be executed on files or folders found.



```
Activities Terminal Sep 23 20:42
adarsh@adarsh-VirtualBox:~$ find ./network -name state.txt
adarsh@adarsh-VirtualBox:~$ find ./network -empty
adarsh@adarsh-VirtualBox:~$
```

## Grep

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. The pattern that is searched in the file is referred to as the regular expression (grep stands for globally search for regular expression and print out).



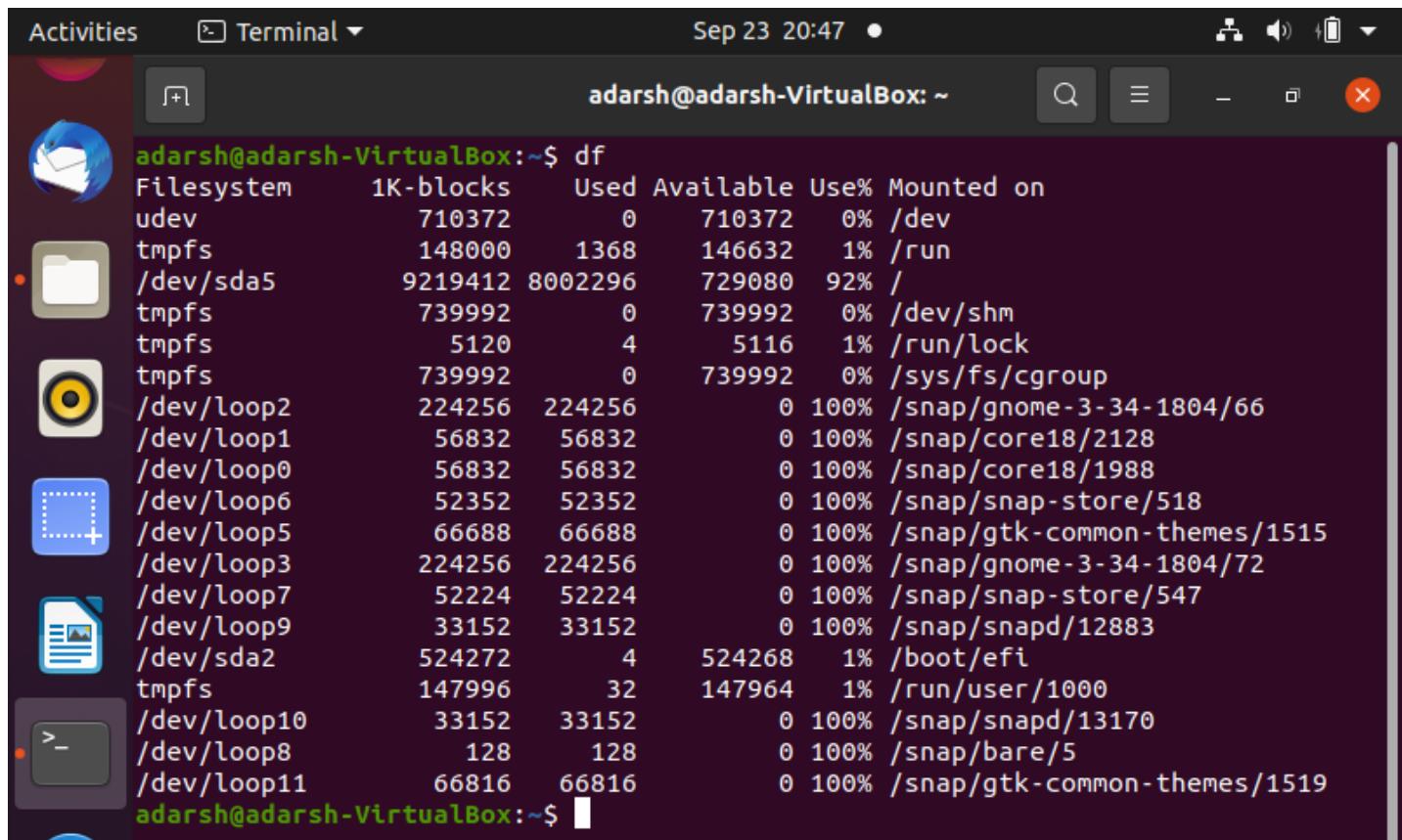
```
Activities Terminal Sep 23 20:47
adarsh@adarsh-VirtualBox:~$ cat > unixfile.txt
unix is great os.unix is opensource.unix is free os.
learn operating system.
Unix linux which one you choose.
UNIX is easy to learn_unix is a multiuser os.Learn unix .unix is a powerful.
^C
adarsh@adarsh-VirtualBox:~$ grep -i "UNix" unixfile.txt
unix is great os.unix is opensource.unix is free os.
Unix linux which one you choose.
UNIX is easy to learn_unix is a multiuser os.Learn unix .unix is a powerful.
adarsh@adarsh-VirtualBox:~$
```

## df

The **df** command (short for disk free), is used to display information related to file systems about total space and available space.

### Syntax :

**df [OPTION]... [FILE]...**



```
adarsh@adarsh-VirtualBox:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              710372      0   710372   0% /dev
tmpfs             148000   1368   146632   1% /run
/dev/sda5        9219412 8002296  729080  92% /
tmpfs             739992      0   739992   0% /dev/shm
tmpfs              5120       4    5116   1% /run/lock
tmpfs             739992      0   739992   0% /sys/fs/cgroup
/dev/loop2         224256  224256      0 100% /snap/gnome-3-34-1804/66
/dev/loop1         56832   56832      0 100% /snap/core18/2128
/dev/loop0         56832   56832      0 100% /snap/core18/1988
/dev/loop6         52352   52352      0 100% /snap/snap-store/518
/dev/loop5         66688   66688      0 100% /snap/gtk-common-themes/1515
/dev/loop3         224256  224256      0 100% /snap/gnome-3-34-1804/72
/dev/loop7         52224   52224      0 100% /snap/snap-store/547
/dev/loop9         33152   33152      0 100% /snap/snapd/12883
/dev/sda2          524272     4   524268   1% /boot/efi
tmpfs             147996    32   147964   1% /run/user/1000
/dev/loop10        33152   33152      0 100% /snap/snapd/13170
/dev/loop8           128    128      0 100% /snap/bare/5
/dev/loop11        66816   66816      0 100% /snap/gtk-common-themes/1519
adarsh@adarsh-VirtualBox:~$
```

## Du

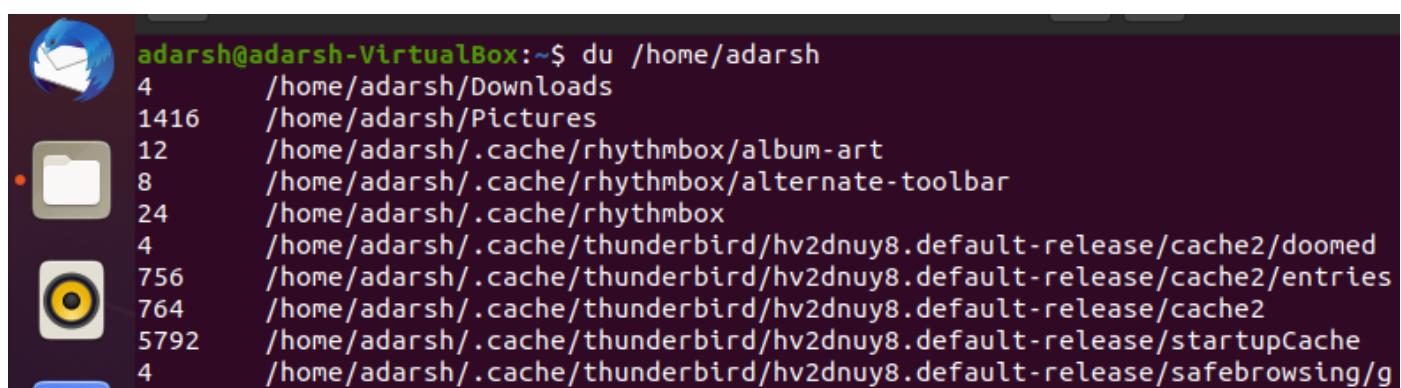
**du** command, short for disk usage, is used to estimate file space usage.

The **du** command can be used to track the files and directories which are consuming excessive amount of space on hard disk drive.

### Syntax :

**du [OPTION]... [FILE]...**

**du [OPTION]... --files0-from=F**



```
adarsh@adarsh-VirtualBox:~$ du /home/adarsh
4      /home/adarsh/Downloads
1416   /home/adarsh/Pictures
12     /home/adarsh/.cache/rhythmbox/album-art
8      /home/adarsh/.cache/rhythmbox/alternate-toolbar
24     /home/adarsh/.cache/rhythmbox
4      /home/adarsh/.cache/thunderbird/hv2dnuy8.default-release/cache2/doomed
756    /home/adarsh/.cache/thunderbird/hv2dnuy8.default-release/cache2/entries
764    /home/adarsh/.cache/thunderbird/hv2dnuy8.default-release/cache2
5792   /home/adarsh/.cache/thunderbird/hv2dnuy8.default-release/startupCache
4      /home/adarsh/.cache/thunderbird/hv2dnuy8.default-release/safebrowsing/g
```

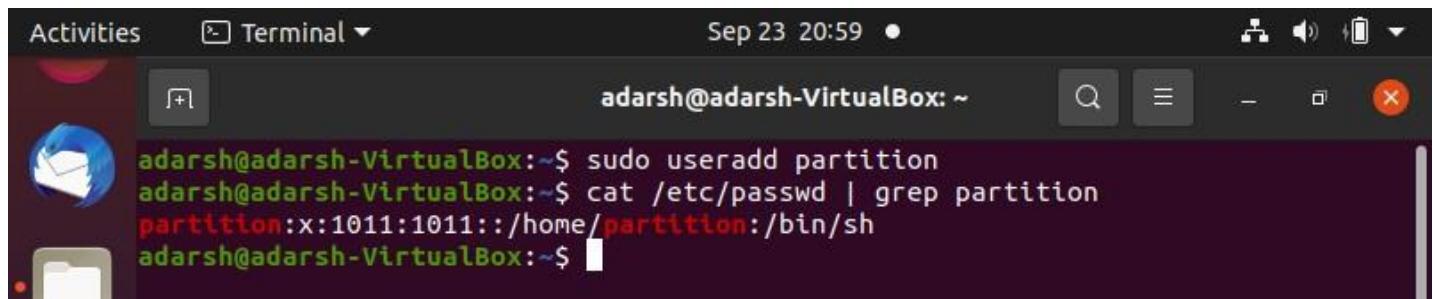
## Useradd

**useradd** is a command in Linux that is used to add user accounts to your system. It is just a symbolic link to adduser command in Linux and the difference between both of them is that useradd is a native binary compiled with system whereas adduser is a Perl script which uses useradd binary in the background. It make changes to the following files:

- /etc/passwd
- /etc/shadow
- /etc/group
- /etc/gshadow
- creates a directory for new user in /home

### Syntax:

```
useradd [options] name_of_the_user
```



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal". The date and time at the top right are "Sep 23 20:59". The terminal window shows the following command and its output:

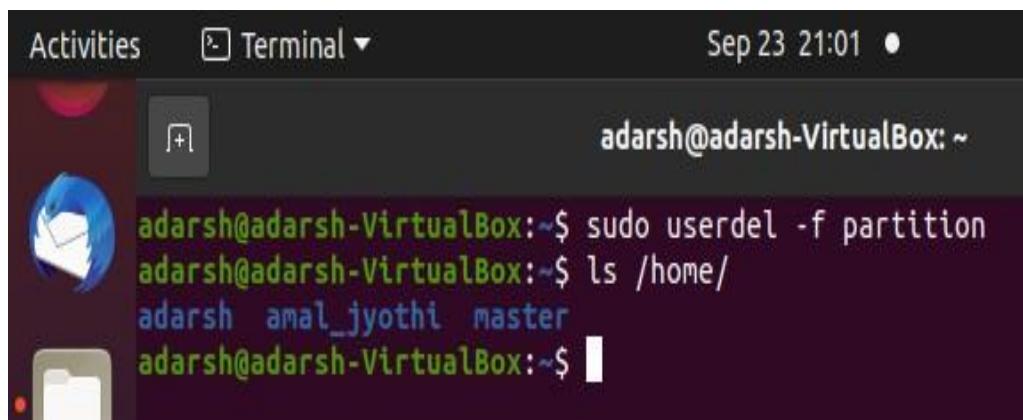
```
adarsh@adarsh-VirtualBox:~$ sudo useradd partition
adarsh@adarsh-VirtualBox:~$ cat /etc/passwd | grep partition
partition:x:1011:1011::/home/partition:/bin/sh
adarsh@adarsh-VirtualBox:~$
```

## Userdel

**userdel** command in Linux system is used to delete a user account and related files. This command basically modifies the system account files, deleting all the entries which refer to the username LOGIN. It is a low-level utility for removing the users.

### Syntax:

```
userdel [options] LOGIN
```



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal". The date and time at the top right are "Sep 23 21:01". The terminal window shows the following command and its output:

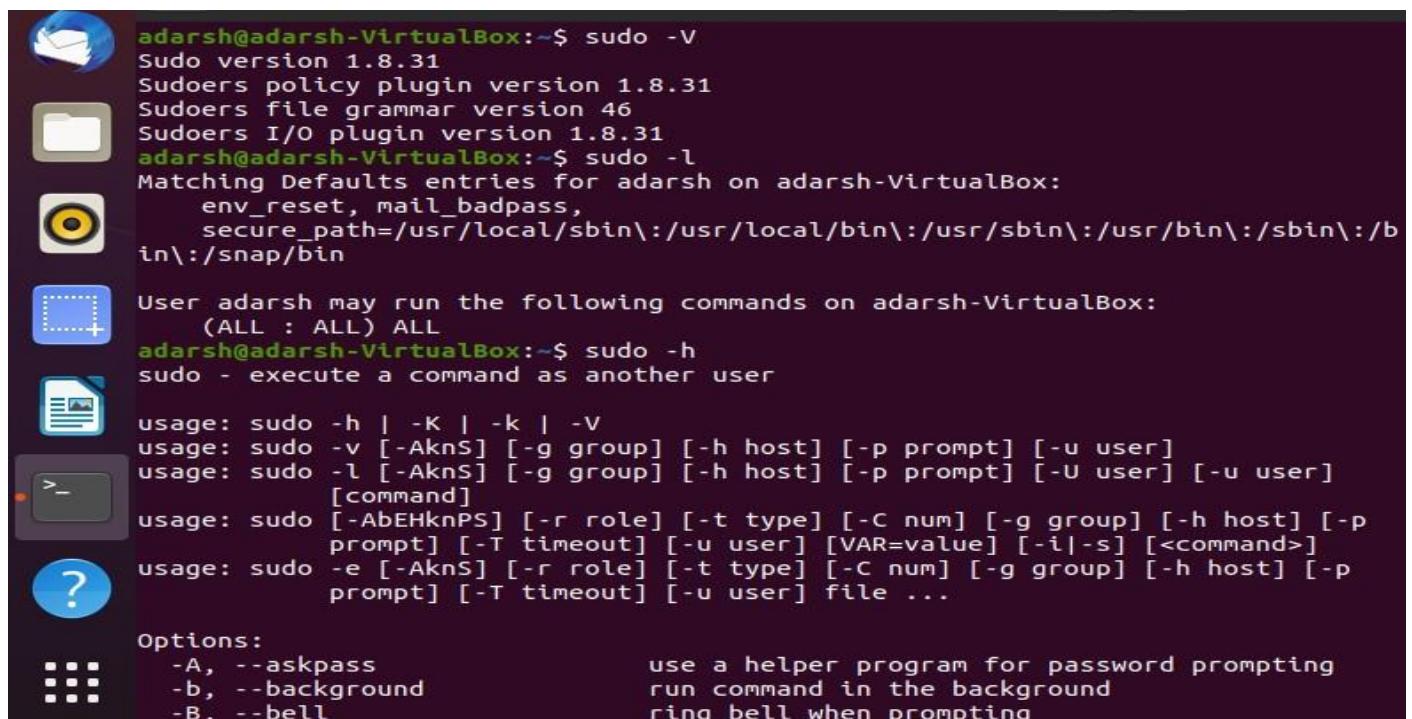
```
adarsh@adarsh-VirtualBox:~$ sudo userdel -f partition
adarsh@adarsh-VirtualBox:~$ ls /home/
adarsh amal_jyothi master
adarsh@adarsh-VirtualBox:~$
```

# Sudo

sudo (**Super User DO**) command in Linux is generally used as a prefix of some command that only superuser are allowed to run. If you prefix “**sudo**” with any command, it will run that command with elevated privileges or in other words allow a user with proper permissions to execute a command as another user, such as the superuser. This is the equivalent of “run as administrator” option in Windows. The option of sudo lets us have multiple administrators.

These users who can use the **sudo** command need to have an entry in the **sudoers** file located at “**/etc/sudoers**”. Remember that to edit or view the sudoers file you have to use sudo command. To edit the sudoers file it is recommended to use “**visudo**” command.

By default, sudo requires that users authenticate themselves with a password which is the user’s password, not the root password itself.



```
adarsh@adarsh-VirtualBox:~$ sudo -V
Sudo version 1.8.31
Sudoers policy plugin version 1.8.31
Sudoers file grammar version 46
Sudoers I/O plugin version 1.8.31
adarsh@adarsh-VirtualBox:~$ sudo -l
Matching Defaults entries for adarsh on adarsh-VirtualBox:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User adarsh may run the following commands on adarsh-VirtualBox:
    (ALL : ALL) ALL
adarsh@adarsh-VirtualBox:~$ sudo -h
sudo - execute a command as another user

usage: sudo -h | -K | -k | -v
usage: sudo -v [-AknS] [-g group] [-h host] [-p prompt] [-u user]
usage: sudo -l [-AknS] [-g group] [-h host] [-p prompt] [-U user] [-u user]
           [command]
usage: sudo [-AbEHknPS] [-r role] [-t type] [-C num] [-g group] [-h host] [-p
           prompt] [-T timeout] [-u user] [VAR=value] [-i|-s] [<command>]
usage: sudo -e [-AknS] [-r role] [-t type] [-C num] [-g group] [-h host] [-p
           prompt] [-T timeout] [-u user] file ...

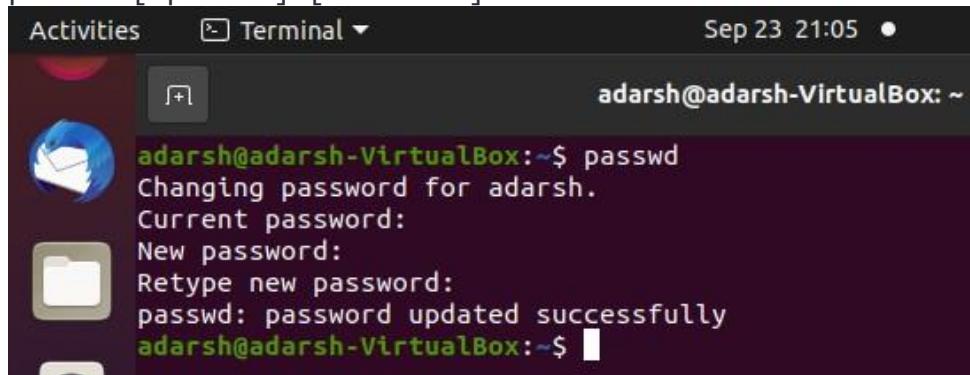
Options:
  -A, --askpass          use a helper program for password prompting
  -b, --background       run command in the background
  -B, --bell              ring bell when prompting
```

# Passwd

**passwd** command in Linux is used to change the user account passwords. The root user reserves the privilege to change the password for any user on the system, while a normal user can only change the account password for his or her own account.

## Syntax:

```
passwd [options] [username]
```



```
Activities Terminal Sep 23 21:05 •
adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ passwd
Changing password for adarsh.
Current password:
New password:
Retype new password:
passwd: password updated successfully
adarsh@adarsh-VirtualBox:~$
```



**SUBMITTED BY:**

**ADARSH S**

**CLASS :MCA S2 A**

**ROLL NO : 03**

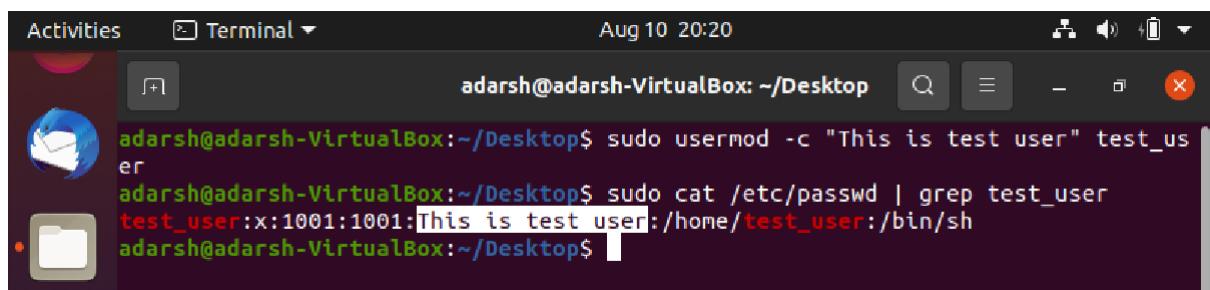
## **ASSIGNMENT 3:BASIC LINUX COMMANDS**

### **20MCA136 - Networking & System Administration Lab**

#### **1.usermod**

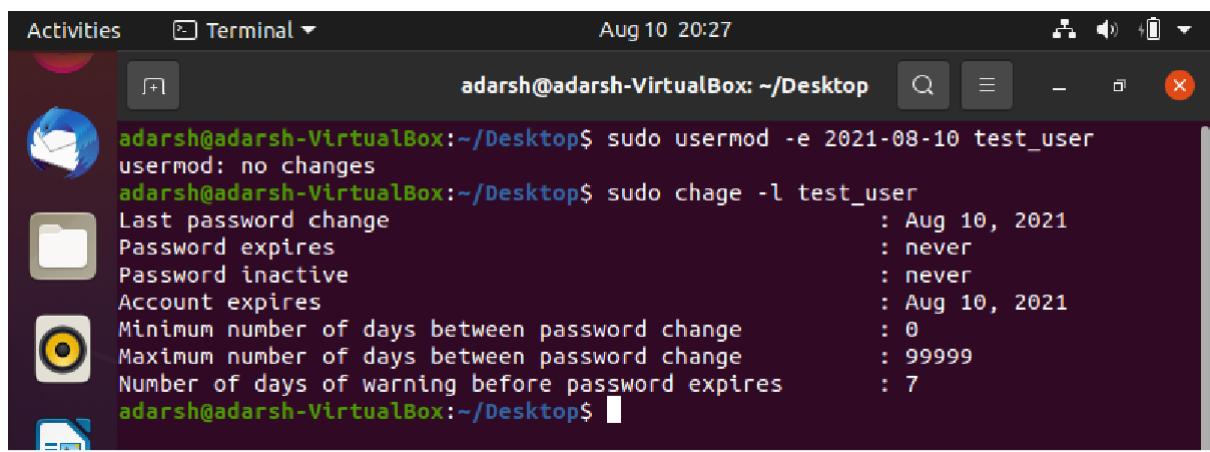
usermod command or modify user is a command in Linux that is used to change the properties of a user in Linux through the command line. After creating a user we have to sometimes change their attributes like password or login directory etc. so in order to do that we use the Usermod command.

#### **1. To add a comment for a user**



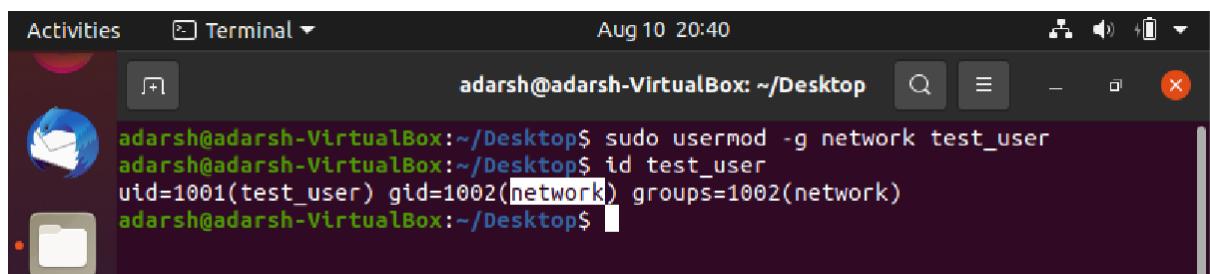
```
Activities Terminal Aug 10 20:20
adarsh@adarsh-VirtualBox: ~/Desktop
adarsh@adarsh-VirtualBox:~/Desktop$ sudo usermod -c "This is test user" test_user
adarsh@adarsh-VirtualBox:~/Desktop$ sudo cat /etc/passwd | grep test_user
test_user:x:1001:1001:This is test user:/home/test_user:/bin/sh
adarsh@adarsh-VirtualBox:~/Desktop$
```

#### **3. To change the expiry date of a user**



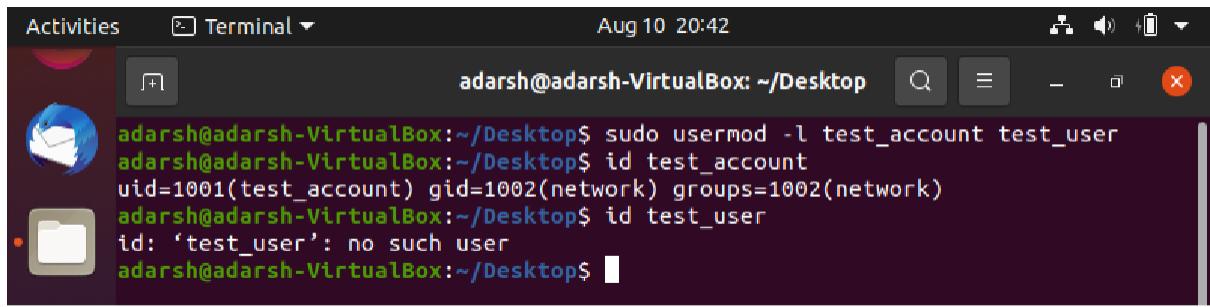
```
Activities Terminal Aug 10 20:27
adarsh@adarsh-VirtualBox: ~/Desktop
adarsh@adarsh-VirtualBox:~/Desktop$ sudo usermod -e 2021-08-10 test_user
usermod: no changes
adarsh@adarsh-VirtualBox:~/Desktop$ sudo chage -l test_user
Last password change : Aug 10, 2021
Password expires      : never
Password inactive     : never
Account expires       : Aug 10, 2021
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires: 7
adarsh@adarsh-VirtualBox:~/Desktop$
```

#### **4. To change the group of a user**



```
Activities Terminal Aug 10 20:40
adarsh@adarsh-VirtualBox: ~/Desktop
adarsh@adarsh-VirtualBox:~/Desktop$ sudo usermod -g network test_user
adarsh@adarsh-VirtualBox:~/Desktop$ id test_user
uid=1001(test_user) gid=1002(network) groups=1002(network)
adarsh@adarsh-VirtualBox:~/Desktop$
```

## 5. To change user login name



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal" and the date and time are "Aug 10 20:42". The user is "adarsh@adarsh-VirtualBox" and the current directory is "~/Desktop". The terminal shows the following command and its output:

```
adarsh@adarsh-VirtualBox:~/Desktop$ sudo usermod -l test_account test_user
adarsh@adarsh-VirtualBox:~/Desktop$ id test_account
uid=1001(test_account) gid=1002(network) groups=1002(network)
adarsh@adarsh-VirtualBox:~/Desktop$ id test_user
id: 'test_user': no such user
adarsh@adarsh-VirtualBox:~/Desktop$
```

## 2. groupadd

**addgroup** command in Linux is used to add a new group to your current Linux machine. This command allows you to modify the configurations of the group which is to be created. It is similar to the [groupadd](#) command in Linux. The addgroup command is much interactive as compared to groupadd command.



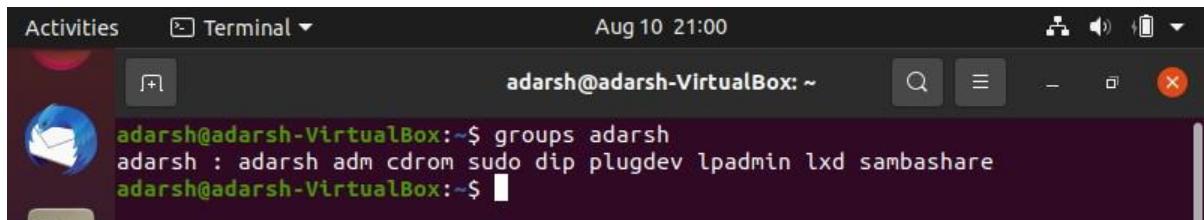
A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "Terminal" and the date and time are "Aug 10 20:57". The user is "adarsh@adarsh-VirtualBox" and the current directory is "~". The terminal shows the following command and its output:

```
adarsh@adarsh-VirtualBox:~$ sudo groupadd linux
adarsh@adarsh-VirtualBox:~$ sudo tail /etc/group
pulse-access:x:129:
gdm:x:130:
lxd:x:131:adarsh
adarsh:x:1000:
sambashare:x:132:adarsh
systemd-coredump:x:999:
test_user:x:1001:
network:x:1002:
net_user:x:1003:
linux:x:x:1004:
adarsh@adarsh-VirtualBox:~$
```

## 3. groups

- Groups command prints the names of the primary and any supplementary groups for each given username, or the current process if no names are given.
- If more than one name is given, the name of each user is printed before the list of that user's groups and the username is separated from the group list by a colon.

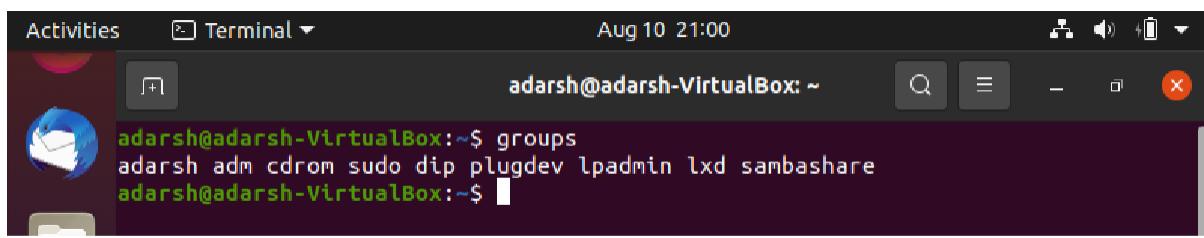
## 1. Provided with a user name



A screenshot of a Linux desktop environment showing a terminal window. The terminal title bar says "adarsh@adarsh-VirtualBox ~". The terminal window displays the command "groups adarsh" followed by the output "adarsh : adarsh adm cdrom sudo dip plugdev lpadmin lxd sambashare". The desktop interface includes a dock with icons for Home, Dash, Activities, and Terminal.

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

## 2. No username is passed then this will display group membership for the current user

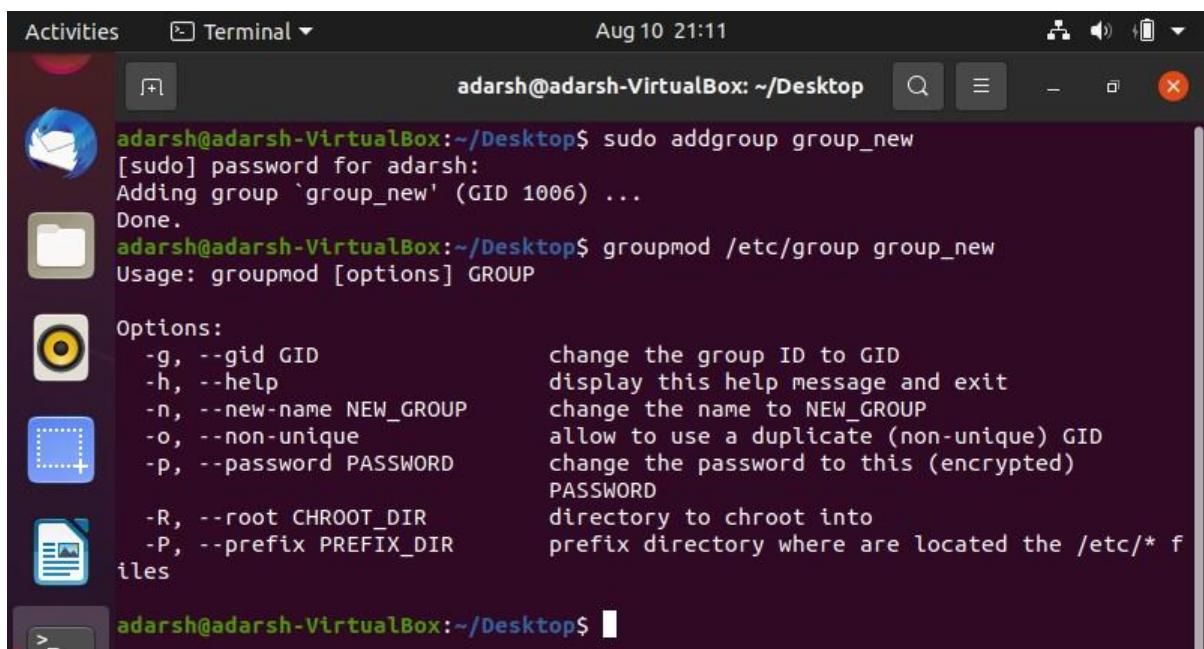


A screenshot of a Linux desktop environment showing a terminal window. The terminal title bar says "adarsh@adarsh-VirtualBox ~". The terminal window displays the command "groups" followed by the output "adarsh : adarsh adm cdrom sudo dip plugdev lpadmin lxd sambashare". The desktop interface includes a dock with icons for Home, Dash, Activities, and Terminal.

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

## 4. groupmod

**groupmod** command in Linux is used to modify or change the existing group on Linux system. It can be handled by superuser or root user. Basically, it modifies a group definition on the system by modifying the right entry in the database of the group.



A screenshot of a Linux desktop environment showing a terminal window. The terminal title bar says "adarsh@adarsh-VirtualBox ~/Desktop". The terminal window displays the command "sudo addgroup group\_new" followed by the output "[sudo] password for adarsh: Adding group `group\_new' (GID 1006) ... Done." Then, the command "groupmod /etc/group group\_new" is run, followed by its usage information: "Usage: groupmod [options] GROUP". Below this, a table of options and their descriptions is shown:

-g, --gid GID	change the group ID to GID
-h, --help	display this help message and exit
-n, --new-name NEW_GROUP	change the name to NEW_GROUP
-o, --non-unique	allow to use a duplicate (non-unique) GID
-p, --password PASSWORD	change the password to this (encrypted) PASSWORD
-R, --root CHROOT_DIR	directory to chroot into
-P, --prefix PREFIX_DIR	prefix directory where are located the /etc/* files

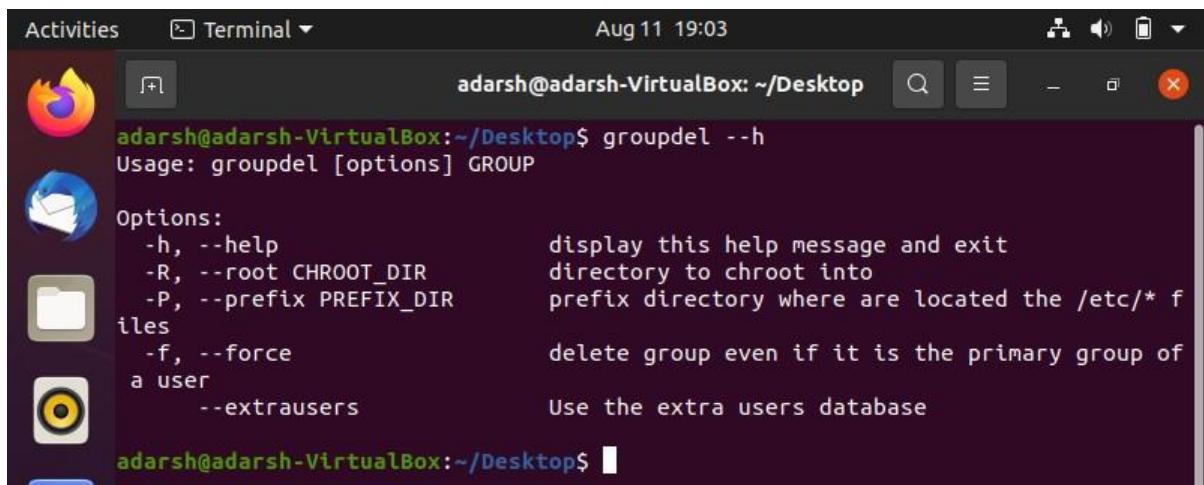
```
adarsh@adarsh-VirtualBox:~/Desktop$ sudo addgroup group_new
[sudo] password for adarsh:
Adding group `group_new' (GID 1006) ...
Done.
adarsh@adarsh-VirtualBox:~/Desktop$ groupmod /etc/group group_new
Usage: groupmod [options] GROUP

Options:
  -g, --gid GID           change the group ID to GID
  -h, --help              display this help message and exit
  -n, --new-name NEW_GROUP   change the name to NEW_GROUP
  -o, --non-unique        allow to use a duplicate (non-unique) GID
  -p, --password PASSWORD    change the password to this (encrypted)
                              PASSWORD
  -R, --root CHROOT_DIR      directory to chroot into
  -P, --prefix PREFIX_DIR    prefix directory where are located the /etc/* files

adarsh@adarsh-VirtualBox:~/Desktop$
```

## 5. groupdel

groupdel command is used to delete a existing group. It will delete all entry that refers to the group, modifies the system account files, and it is handled by superuser or root user.



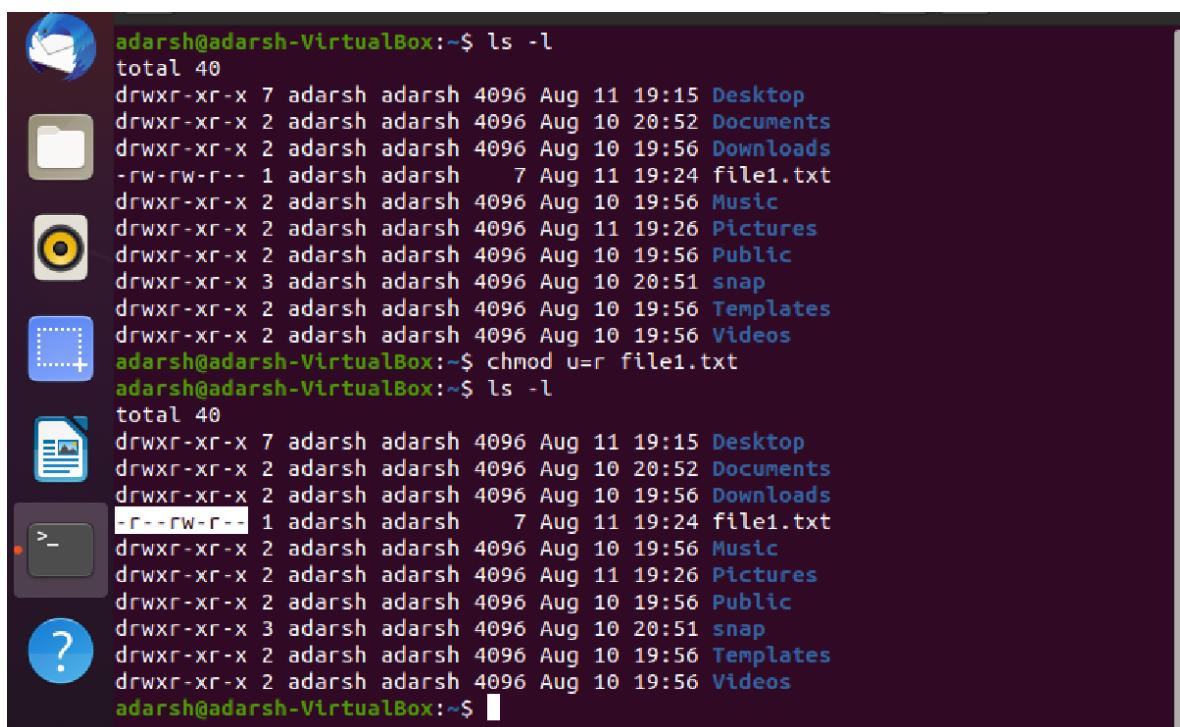
A screenshot of a Linux desktop environment showing a terminal window. The terminal window is titled "Terminal" and has the command "adarsh@adarsh-VirtualBox: ~/Desktop\$ groupdel --h" entered. The output shows the usage of the groupdel command and its options:

```
adarsh@adarsh-VirtualBox:~/Desktop$ groupdel --h
Usage: groupdel [options] GROUP
Options:
  -h, --help          display this help message and exit
  -R, --root CHROOT_DIR
  -P, --prefix PREFIX_DIR
  files              prefix directory where are located the /etc/* f
  -f, --force         delete group even if it is the primary group of
  a user
  --extrausers        Use the extra users database
adarsh@adarsh-VirtualBox:~/Desktop$
```

## 6. chmod

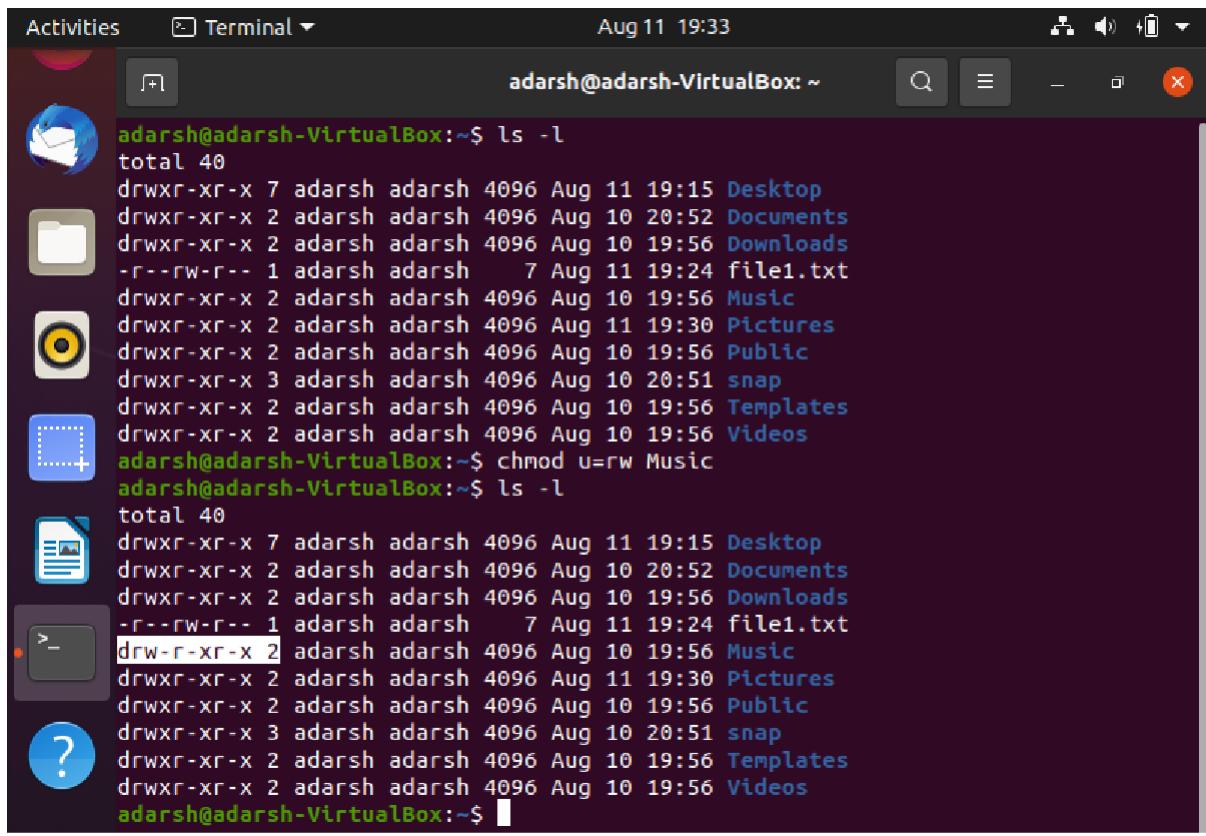
The **chmod** command is used to change the access mode of a file.

The name is an abbreviation of **change mode**.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window has several icons on its left side, including a file, a folder, a terminal, and a question mark. The command "ls -l" is run twice, showing a list of files and their permissions. Then, the command "chmod u=r file1.txt" is run to change the permissions of "file1.txt". Finally, "ls -l" is run again to show the updated permissions.

```
adarsh@adarsh-VirtualBox:~$ ls -l
total 40
drwxr-xr-x 7 adarsh adarsh 4096 Aug 11 19:15 Desktop
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-rw-rw-r-- 1 adarsh adarsh 7 Aug 11 19:24 file1.txt
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Music
drwxr-xr-x 2 adarsh adarsh 4096 Aug 11 19:26 Pictures
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Public
drwxr-xr-x 3 adarsh adarsh 4096 Aug 10 20:51 snap
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Templates
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Videos
adarsh@adarsh-VirtualBox:~$ chmod u=r file1.txt
adarsh@adarsh-VirtualBox:~$ ls -l
total 40
drwxr-xr-x 7 adarsh adarsh 4096 Aug 11 19:15 Desktop
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-r--r--r-- 1 adarsh adarsh 7 Aug 11 19:24 file1.txt
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Music
drwxr-xr-x 2 adarsh adarsh 4096 Aug 11 19:26 Pictures
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Public
drwxr-xr-x 3 adarsh adarsh 4096 Aug 10 20:51 snap
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Templates
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Videos
adarsh@adarsh-VirtualBox:~$
```



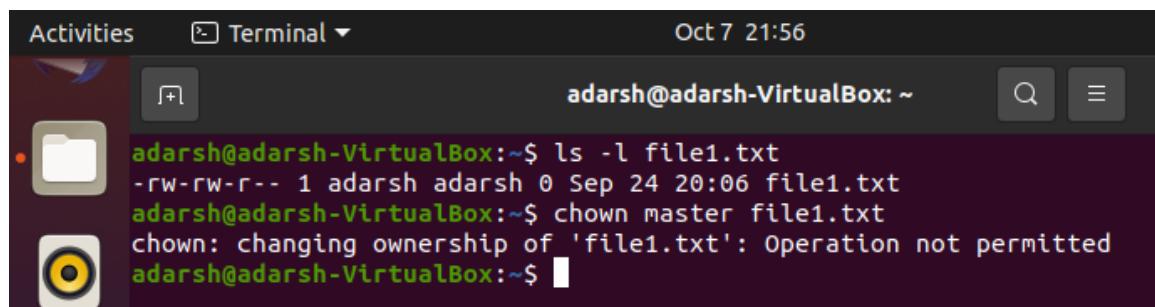
A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window is titled "adarsh@adarsh-VirtualBox ~". The user has run several commands in the terminal:

```
adarsh@adarsh-VirtualBox:~$ ls -l
total 40
drwxr-xr-x 7 adarsh adarsh 4096 Aug 11 19:15 Desktop
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-r--rw-r-- 1 adarsh adarsh 7 Aug 11 19:24 file1.txt
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Music
drwxr-xr-x 2 adarsh adarsh 4096 Aug 11 19:30 Pictures
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Public
drwxr-xr-x 3 adarsh adarsh 4096 Aug 10 20:51 snap
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Templates
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Videos
adarsh@adarsh-VirtualBox:~$ chmod u=rw Music
adarsh@adarsh-VirtualBox:~$ ls -l
total 40
drwxr-xr-x 7 adarsh adarsh 4096 Aug 11 19:15 Desktop
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-r--rw-r-- 1 adarsh adarsh 7 Aug 11 19:24 file1.txt
drw-r-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Music
drwxr-xr-x 2 adarsh adarsh 4096 Aug 11 19:30 Pictures
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Public
drwxr-xr-x 3 adarsh adarsh 4096 Aug 10 20:51 snap
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Templates
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Videos
adarsh@adarsh-VirtualBox:~$
```

## 7. chown

Different users in the operating system have ownership and permission to ensure that the files are secure and put restrictions on who can modify the contents of the files. In Linux there are different users who use the system:

- Each user has some properties associated with them, such as a user ID and a home directory. We can add users into a group to make the process of managing users easier.
- A group can have zero or more users. A specified user can be associated with a “default group”. It can also be a member of other groups on the system as well.



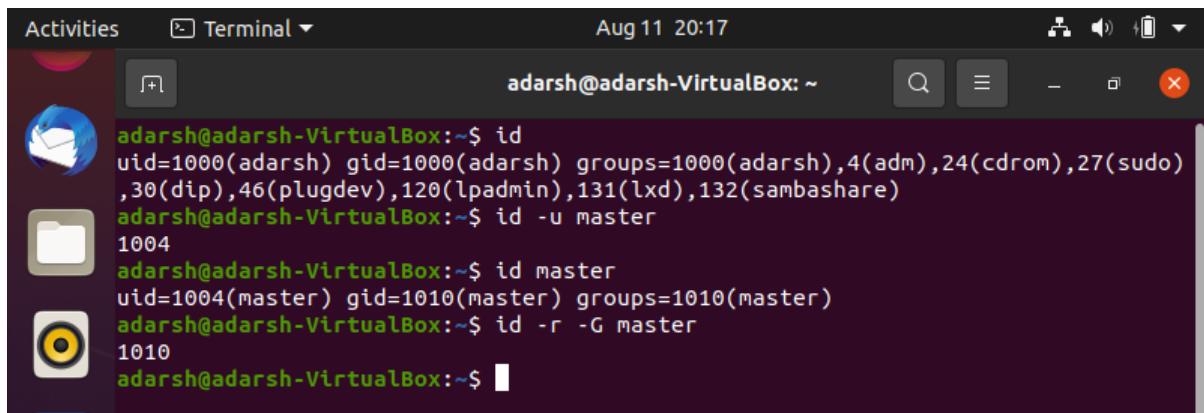
A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window is titled "adarsh@adarsh-VirtualBox ~". The user has run the following commands:

```
adarsh@adarsh-VirtualBox:~$ ls -l file1.txt
-rw-rw-r-- 1 adarsh adarsh 0 Sep 24 20:06 file1.txt
adarsh@adarsh-VirtualBox:~$ chown master file1.txt
chown: changing ownership of 'file1.txt': Operation not permitted
adarsh@adarsh-VirtualBox:~$
```

## 8.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 or any other user in the server. This command is useful to find out the following information as listed below:

- User name and real user id.
- Find out the specific Users UID.
- Show the UID and all groups associated with a user.
- List out all the groups a user belongs to.
- Display security context of the current user.



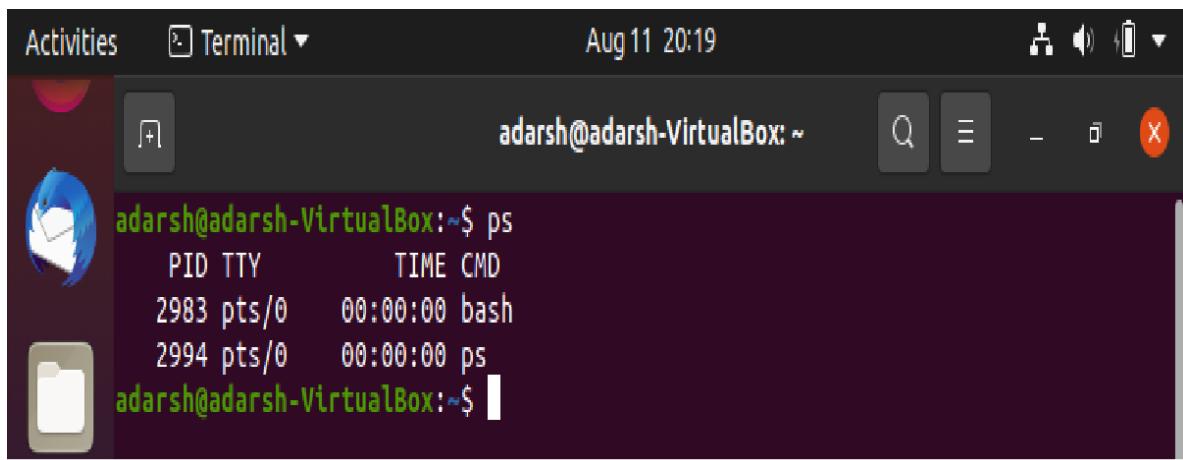
A screenshot of a terminal window titled "Terminal". The window shows the command "id" being run three times. The first two runs show the user "adarsh" with a UID of 1000 and a GID of 1000, belonging to multiple groups including adm, cdrom, sudo, dip, plugdev, lpadmin, lxd, and sambashare. The third run shows the user "master" with a UID of 1004 and a GID of 1010, also belonging to the master group. The terminal window has a dark background with light-colored text and icons.

```
adarsh@adarsh-VirtualBox:~$ id
uid=1000(adarsh) gid=1000(adarsh) groups=1000(adarsh),4(adm),24(cdrom),27(sudo)
,30(dip),46(plugdev),120(lpadmin),131(lxd),132(sambashare)
adarsh@adarsh-VirtualBox:~$ id -u master
1004
adarsh@adarsh-VirtualBox:~$ id master
uid=1004(master) gid=1010(master) groups=1010(master)
adarsh@adarsh-VirtualBox:~$ id -r -G master
1010
adarsh@adarsh-VirtualBox:~$
```

## 9.ps

ps command is used to list the currently running processes and their PIDs along with some other information depends on different options. It reads the process information from the virtual files in /proc file-system. /proc contains virtual files, this is the reason it's referred as a virtual file system.

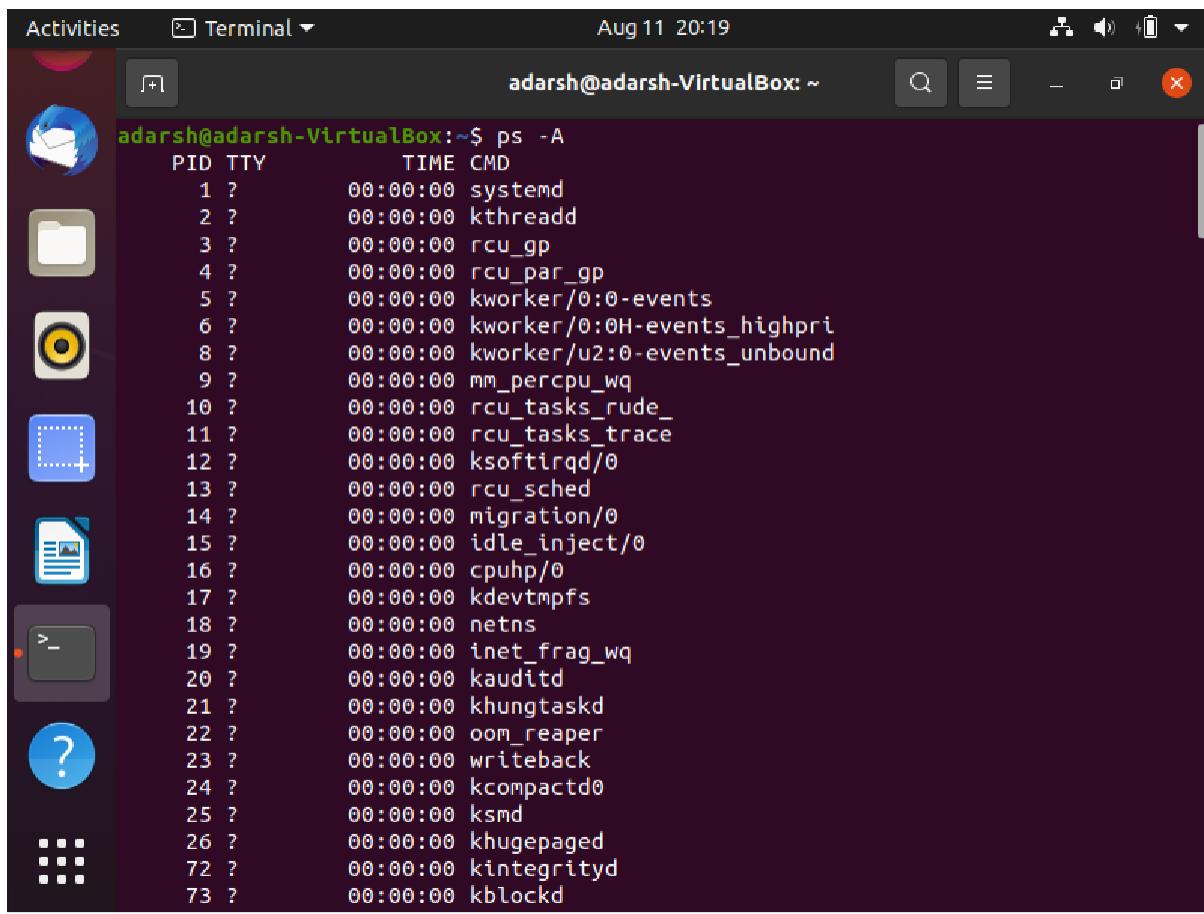
### 1. Shows the processes for the current shell



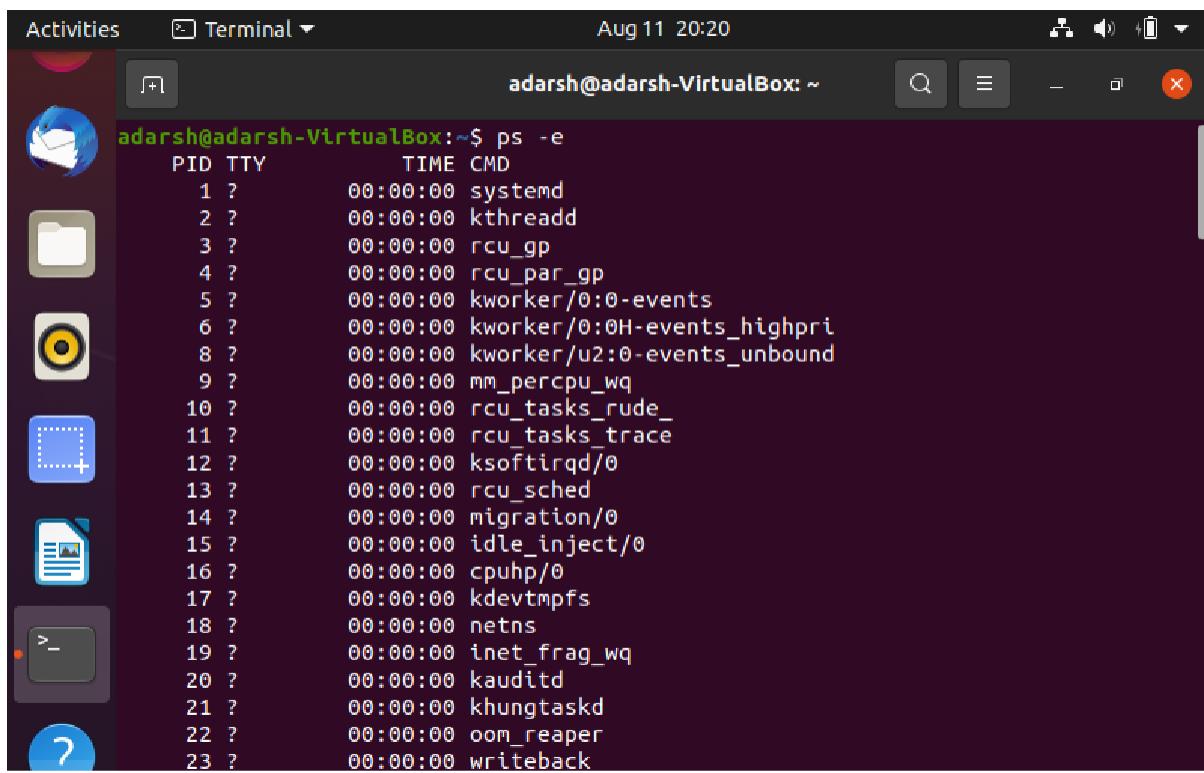
A screenshot of a terminal window titled "Terminal". The window shows the command "ps" being run. It displays two processes: one with PID 2983 running in TTY pts/0 for 00:00:00, which is the bash shell, and another with PID 2994 running in TTY pts/0 for 00:00:00, which is the ps command itself. The terminal window has a dark background with light-colored text and icons.

```
adarsh@adarsh-VirtualBox:~$ ps
PID TTY      TIME CMD
2983 pts/0    00:00:00 bash
2994 pts/0    00:00:00 ps
adarsh@adarsh-VirtualBox:~$
```

2. View all the running processes use either of the following option with ps

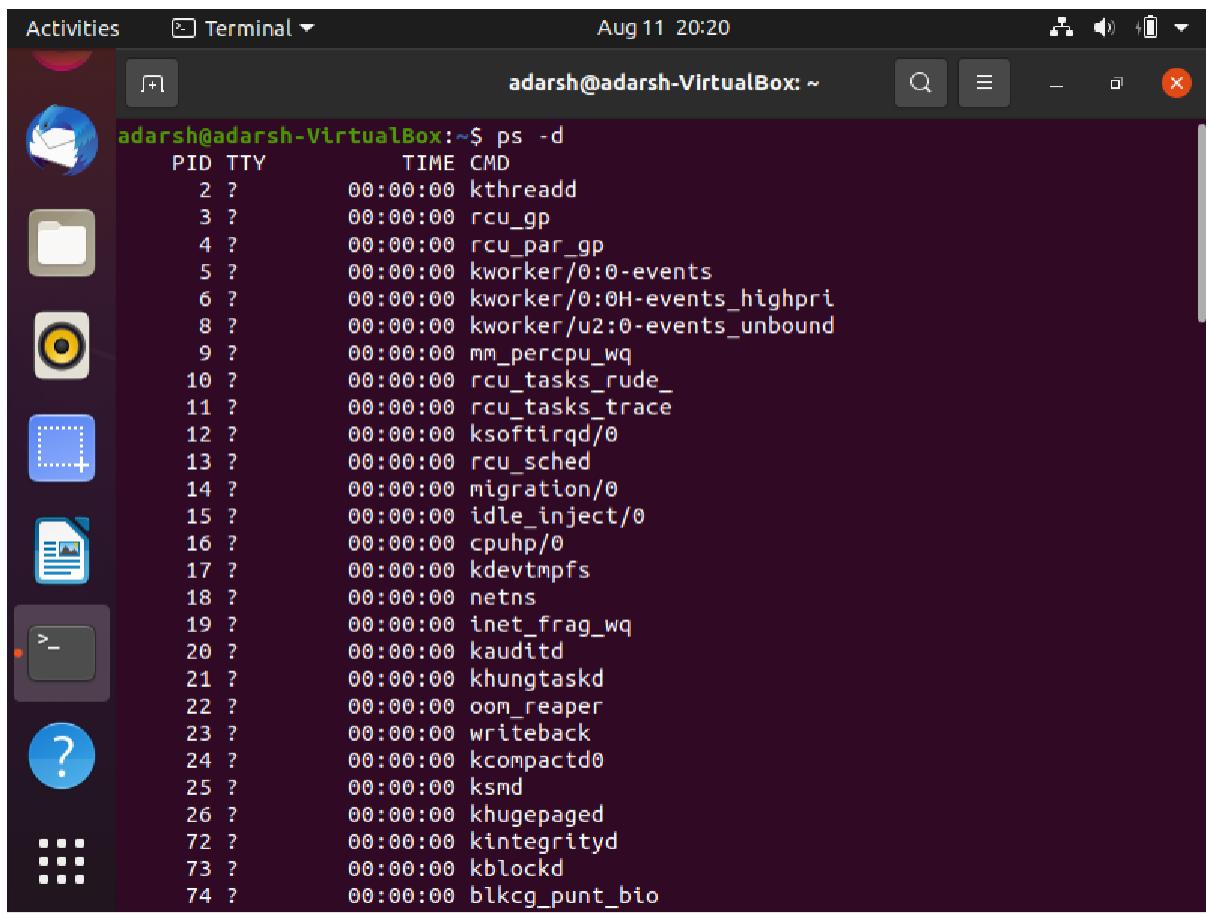


```
adarsh@adarsh-VirtualBox:~$ ps -A
PID TTY      TIME CMD
 1 ?    00:00:00 systemd
 2 ?    00:00:00 kthreadd
 3 ?    00:00:00 rcu_gp
 4 ?    00:00:00 rcu_par_gp
 5 ?    00:00:00 kworker/0:0-events
 6 ?    00:00:00 kworker/0:0H-events_highpri
 8 ?    00:00:00 kworker/u2:0-events_unbound
 9 ?    00:00:00 mm_percpu_wq
10 ?   00:00:00 rcu_tasks_rude_
11 ?   00:00:00 rcu_tasks_trace
12 ?   00:00:00 ksoftirqd/0
13 ?   00:00:00 rcu_sched
14 ?   00:00:00 migration/0
15 ?   00:00:00 idle_inject/0
16 ?   00:00:00 cpuhp/0
17 ?   00:00:00 kdevtmpfs
18 ?   00:00:00 netns
19 ?   00:00:00 inet_frag_wq
20 ?   00:00:00 kaudit
21 ?   00:00:00 khungtaskd
22 ?   00:00:00 oom_reaper
23 ?   00:00:00 writeback
24 ?   00:00:00 kcompactd0
25 ?   00:00:00 ksmd
26 ?   00:00:00 khugepaged
72 ?   00:00:00 kintegrityd
73 ?   00:00:00 kblockd
```



```
adarsh@adarsh-VirtualBox:~$ ps -e
PID TTY      TIME CMD
 1 ?    00:00:00 systemd
 2 ?    00:00:00 kthreadd
 3 ?    00:00:00 rcu_gp
 4 ?    00:00:00 rcu_par_gp
 5 ?    00:00:00 kworker/0:0-events
 6 ?    00:00:00 kworker/0:0H-events_highpri
 8 ?    00:00:00 kworker/u2:0-events_unbound
 9 ?    00:00:00 mm_percpu_wq
10 ?   00:00:00 rcu_tasks_rude_
11 ?   00:00:00 rcu_tasks_trace
12 ?   00:00:00 ksoftirqd/0
13 ?   00:00:00 rcu_sched
14 ?   00:00:00 migration/0
15 ?   00:00:00 idle_inject/0
16 ?   00:00:00 cpuhp/0
17 ?   00:00:00 kdevtmpfs
18 ?   00:00:00 netns
19 ?   00:00:00 inet_frag_wq
20 ?   00:00:00 kaudit
21 ?   00:00:00 khungtaskd
22 ?   00:00:00 oom_reaper
23 ?   00:00:00 writeback
```

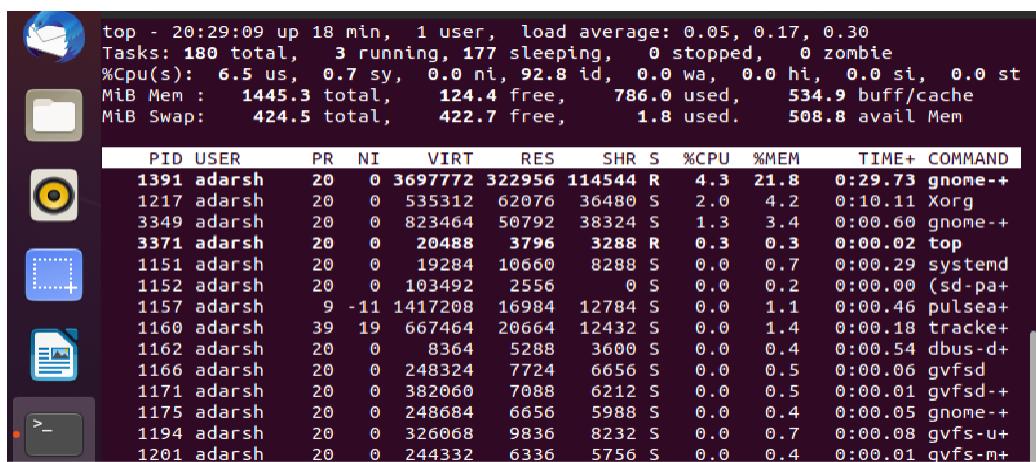
### 3. View all the processes except session leaders :



```
adarsh@adarsh-VirtualBox:~$ ps -d
PID TTY      TIME CMD
 2 ?        00:00:00 kthreadd
 3 ?        00:00:00 rcu_gp
 4 ?        00:00:00 rcu_par_gp
 5 ?        00:00:00 kworker/0:0-events
 6 ?        00:00:00 kworker/0:0H-events_highpri
 8 ?        00:00:00 kworker/u2:0-events_unbound
 9 ?        00:00:00 mm_percpu_wq
10 ?       00:00:00 rcu_tasks_rude_
11 ?       00:00:00 rcu_tasks_trace
12 ?       00:00:00 ksoftirqd/0
13 ?       00:00:00 rcu_sched
14 ?       00:00:00 migration/0
15 ?       00:00:00 idle_inject/0
16 ?       00:00:00 cpuhp/0
17 ?       00:00:00 kdevtmpfs
18 ?       00:00:00 netns
19 ?       00:00:00 inet_frag_wq
20 ?       00:00:00 kaudit
21 ?       00:00:00 khungtaskd
22 ?       00:00:00 oom_reaper
23 ?       00:00:00 writeback
24 ?       00:00:00 kcompactd0
25 ?       00:00:00 ksm
26 ?       00:00:00 khugepaged
72 ?       00:00:00 kintegrityd
73 ?       00:00:00 kblockd
74 ?       00:00:00 blkcg_punt_bio
```

### 10.top

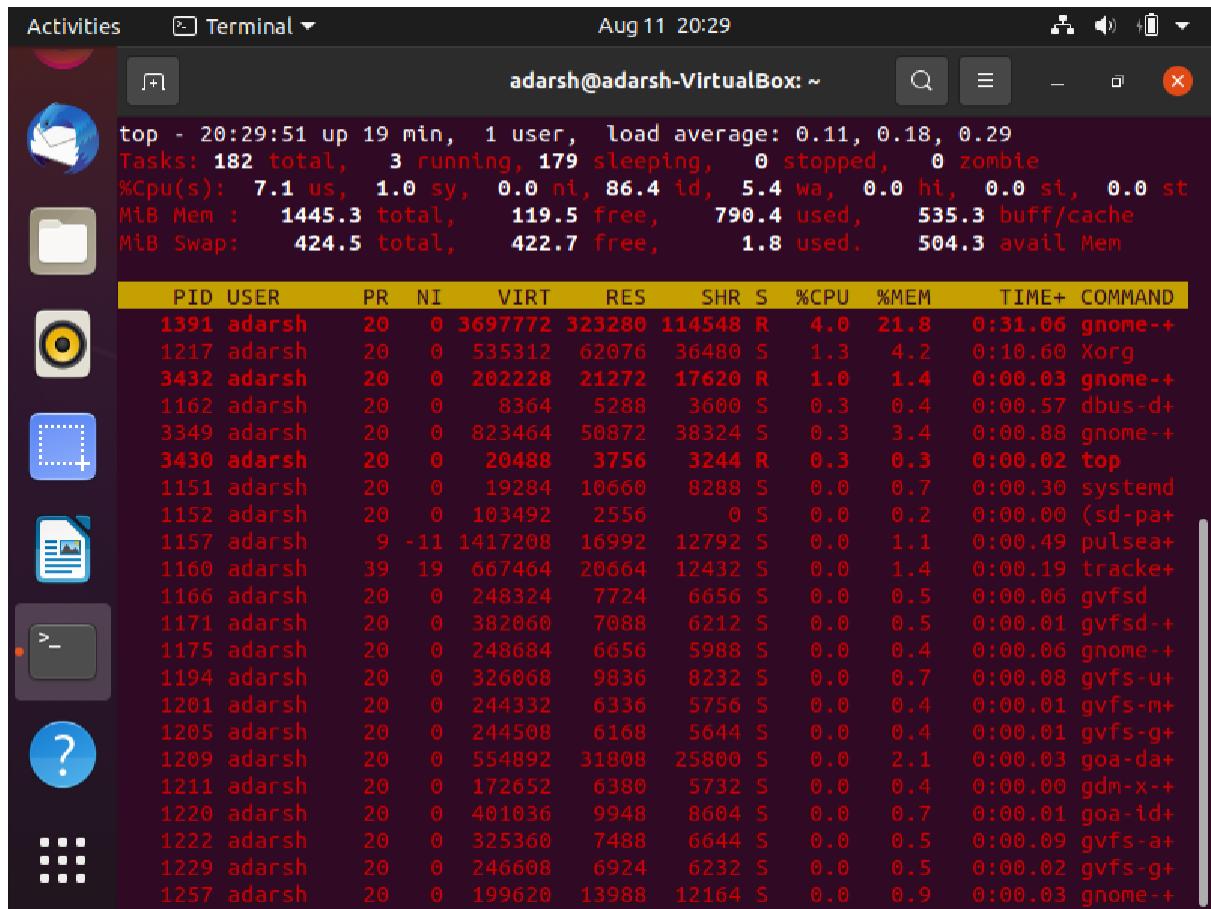
**top** command is used to show the Linux processes. It provides a dynamic real-time view of the running system. Usually, this command shows the summary information of the system and the list of processes or threads which are currently managed by the Linux Kernel.



```
top - 20:29:09 up 18 min,  1 user,  load average: 0.05, 0.17, 0.30
Tasks: 180 total,   3 running, 177 sleeping,   0 stopped,   0 zombie
%Cpu(s):  6.5 us,  0.7 sy,  0.0 ni, 92.8 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem : 1445.3 total,   124.4 free,   786.0 used,   534.9 buff/cache
MiB Swap:  424.5 total,    422.7 free,      1.8 used,   508.8 avail Mem

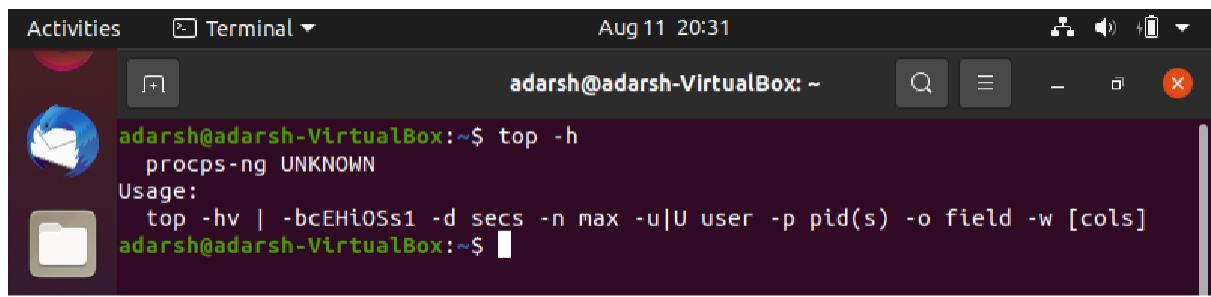
 PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM TIME+ COMMAND
1391 adarsh    20   0 3697772 322956 114544 R  4.3 21.8  0:29.73 gnome-+
1217 adarsh    20   0 535312 62076 30480 S  2.0  4.2  0:10.11 Xorg
3349 adarsh    20   0 823464 50792 38324 S  1.3  3.4  0:00.60 gnome-+
3371 adarsh    20   0 20488  3796  3288 R  0.3  0.3  0:00.02 top
1151 adarsh    20   0 19284 10660  8288 S  0.0  0.7  0:00.29 systemd
1152 adarsh    20   0 103492 2556    0 S  0.0  0.2  0:00.00 (sd-pa+)
1157 adarsh    9 -11 1417208 16984 12784 S  0.0  1.1  0:00.46 pulsea+
1160 adarsh   39  19 667464 20664 12432 S  0.0  1.4  0:00.18 tracke+
1162 adarsh    20   0  8364  5288  3600 S  0.0  0.4  0:00.54 dbus-d+
1166 adarsh    20   0 248324  7724  6656 S  0.0  0.5  0:00.06 gvfsd
1171 adarsh    20   0 382060  7088  6212 S  0.0  0.5  0:00.01 gvfsd-+
1175 adarsh    20   0 248684  6656  5988 S  0.0  0.4  0:00.05 gnome-+
1194 adarsh    20   0 326068  9836  8232 S  0.0  0.7  0:00.08 gvfs-u+
1201 adarsh    20   0 244332  6336  5756 S  0.0  0.4  0:00.01 gvts-m+
```

## 1. Display Specific User Process

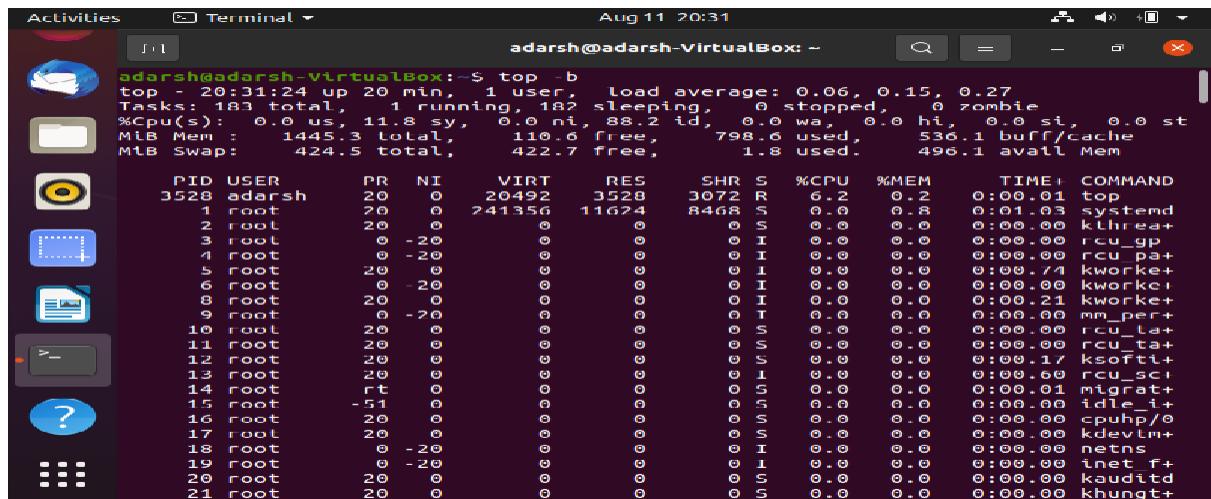


```
Activities Terminal Aug 11 20:29 adarsh@adarsh-VirtualBox: ~
top - 20:29:51 up 19 min, 1 user, load average: 0.11, 0.18, 0.29
Tasks: 182 total, 3 running, 179 sleeping, 0 stopped, 0 zombie
%Cpu(s): 7.1 us, 1.0 sy, 0.0 ni, 86.4 id, 5.4 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 1445.3 total, 119.5 free, 790.4 used, 535.3 buff/cache
Swap: 424.5 total, 422.7 free, 1.8 used. 504.3 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
1391 adarsh 20 0 3697772 323280 114548 R 4.0 21.8 0:31.06 gnome+-+
1217 adarsh 20 0 535312 62076 36480 S 1.3 4.2 0:10.60 Xorg
3432 adarsh 20 0 202228 21272 17620 R 1.0 1.4 0:00.03 gnome+-+
1162 adarsh 20 0 8364 5288 3600 S 0.3 0.4 0:00.57 dbus-d+
3349 adarsh 20 0 823464 50872 38324 S 0.3 3.4 0:00.88 gnome+-+
3430 adarsh 20 0 20488 3756 3244 R 0.3 0.3 0:00.02 top
1151 adarsh 20 0 19284 10660 8288 S 0.0 0.7 0:00.30 systemd
1152 adarsh 20 0 103492 2556 0 S 0.0 0.2 0:00.00 (sd-pa+
1157 adarsh 9 -11 1417208 16992 12792 S 0.0 1.1 0:00.49 pulsea+
1160 adarsh 39 19 667464 20664 12432 S 0.0 1.4 0:00.19 tracke+
1166 adarsh 20 0 248324 7724 6656 S 0.0 0.5 0:00.06 gvfsd
1171 adarsh 20 0 382060 7088 6212 S 0.0 0.5 0:00.01 gvfsd-
1175 adarsh 20 0 248684 6656 5988 S 0.0 0.4 0:00.06 gnome+-+
1194 adarsh 20 0 326068 9836 8232 S 0.0 0.7 0:00.08 gvfs-u+
1201 adarsh 20 0 244332 6336 5756 S 0.0 0.4 0:00.01 gvfs-m+
1205 adarsh 20 0 244508 6168 5644 S 0.0 0.4 0:00.01 gvfs-g+
1209 adarsh 20 0 554892 31808 25800 S 0.0 2.1 0:00.03 goa-da+
1211 adarsh 20 0 172652 6380 5732 S 0.0 0.4 0:00.00 gdm-x ++
1220 adarsh 20 0 401036 9948 8604 S 0.0 0.7 0:00.01 goa-id+
1222 adarsh 20 0 325360 7488 6644 S 0.0 0.5 0:00.09 gvfs-a+
1229 adarsh 20 0 246608 6924 6232 S 0.0 0.5 0:00.02 gvfs-g+
1257 adarsh 20 0 199620 13988 12164 S 0.0 0.9 0:00.03 gnome+-+
```



```
Activities Terminal Aug 11 20:31 adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ top -h
procps-ng UNKNOWN
Usage:
  top -hv | -bcEHlOSS1 -d secs -n max -u|U user -p pid(s) -o field -w [cols]
adarsh@adarsh-VirtualBox:~$
```



```
Activities Terminal Aug 11 20:31 adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ top -b
top - 20:31:24 up 20 min, 1 user, load average: 0.06, 0.15, 0.27
Tasks: 183 total, 1 running, 182 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 11.8 sy, 0.0 ni, 88.2 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem: 1445.3 total, 110.6 free, 798.6 used, 536.1 buff/cache
Swap: 424.5 total, 422.7 free, 1.8 used. 496.1 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
3528 adarsh 20 0 20492 3528 3072 R 6.2 0.2 0:00.01 top
1 root 20 0 241356 11624 8468 S 0.0 0.8 0:01.03 systemd
2 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kthrea+
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_pa+
5 root 20 0 0 0 0 I 0.0 0.0 0:00.74 kworket+
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworkci+
8 root 20 0 0 0 0 I 0.0 0.0 0:00.21 kworket+
9 root 0 -20 0 0 0 T 0.0 0.0 0:00.00 mm_per+
10 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_la+
11 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rcu_ta+
12 root 20 0 0 0 0 S 0.0 0.0 0:00.17 ksoftti+
13 root 20 0 0 0 0 I 0.0 0.0 0:00.69 rcu_sc+
14 root rt 0 0 0 0 S 0.0 0.0 0:00.01 migrat+
15 root -51 0 0 0 0 S 0.0 0.0 0:00.00 idle_i+
16 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/o+
17 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kdevlin+
18 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 netns
19 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 inet_f+
20 root 20 0 0 0 0 S 0.0 0.0 0:00.00 kaudited
21 root 20 0 0 0 0 S 0.0 0.0 0:00.00 khungt+
```

**Submitted by :**

**ADARSH S**

**MCA S2 A**

## **ASSIGNMENT 4:BASIC LINUX COMMANDS**

### **20MCA136 - Networking & System Administration Lab**

#### **1.wc**

wc stands for **word count**. As the name implies, it is mainly 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.
- By default it displays **four-columnar output**.
- First column shows number of lines present in a file specified, second column shows number of words present in the file, third column shows number of characters present in file and fourth column itself is the file name which are given as argument.

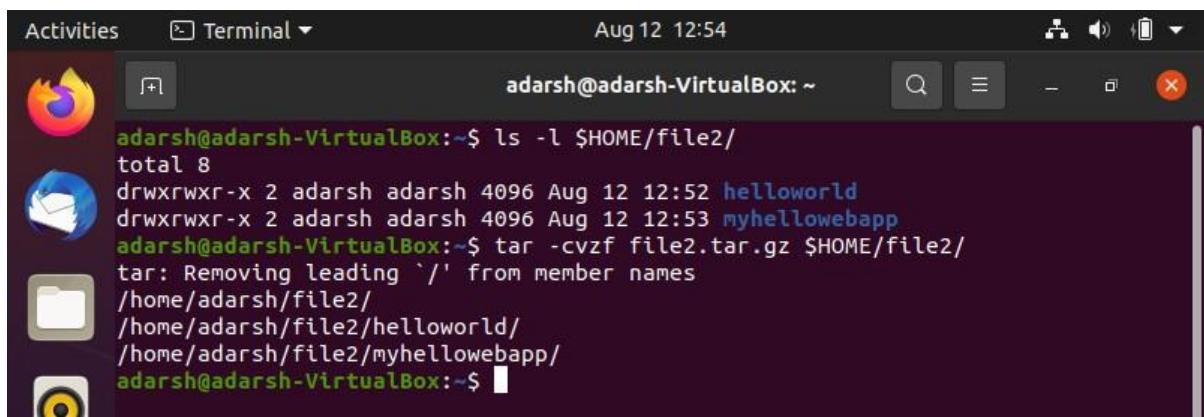
The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Terminal". The terminal content shows the following session:

```
adarsh@adarsh-VirtualBox:~$ cat > state.txt
Andra Pradesh
Kerala
Assam
Bihar
^C
adarsh@adarsh-VirtualBox:~$ cat > capital.txt
Hyderabad
Trivandram
Dispur
Patna
^C
adarsh@adarsh-VirtualBox:~$ wc state.txt
 4 5 33 state.txt
adarsh@adarsh-VirtualBox:~$ wc capital.txt
 4 4 34 capital.txt
adarsh@adarsh-VirtualBox:~$ wc state.txt capital.txt
 4 5 33 state.txt
 4 4 34 capital.txt
 8 9 67 total
adarsh@adarsh-VirtualBox:~$
```

#### **2.1 tar.gz (gzip)**

A **tar.gz** file contains several compressed files to save storage space, as well as bandwidth during the downloading process. The **.tar** file acts as a portable container for other files and is sometimes called a tarball. The **.gz** part of the extension, stands for **gzip**, a commonly-used compression utility.

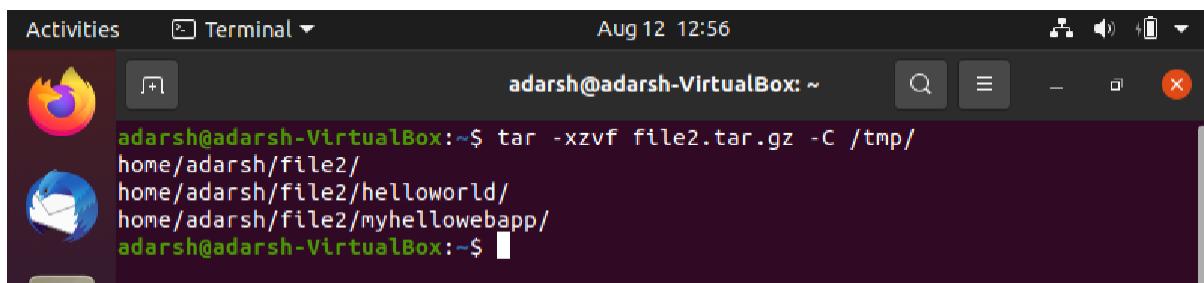
## Create



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "adarsh@adarsh-VirtualBox: ~". The terminal content shows the user running the command "ls -l \$HOME/file2/" which lists files in the directory, and then "tar -cvzf file2.tar.gz \$HOME/file2/" to create a tar archive named "file2.tar.gz".

```
adarsh@adarsh-VirtualBox:~$ ls -l $HOME/file2/
total 8
drwxrwxr-x 2 adarsh adarsh 4096 Aug 12 12:52 helloworld
drwxrwxr-x 2 adarsh adarsh 4096 Aug 12 12:53 myhelloworldapp
adarsh@adarsh-VirtualBox:~$ tar -cvzf file2.tar.gz $HOME/file2/
tar: Removing leading `/' from member names
/home/adarsh/file2/
/home/adarsh/file2/helloworld/
/home/adarsh/file2/myhelloworldapp/
adarsh@adarsh-VirtualBox:~$
```

## Extract

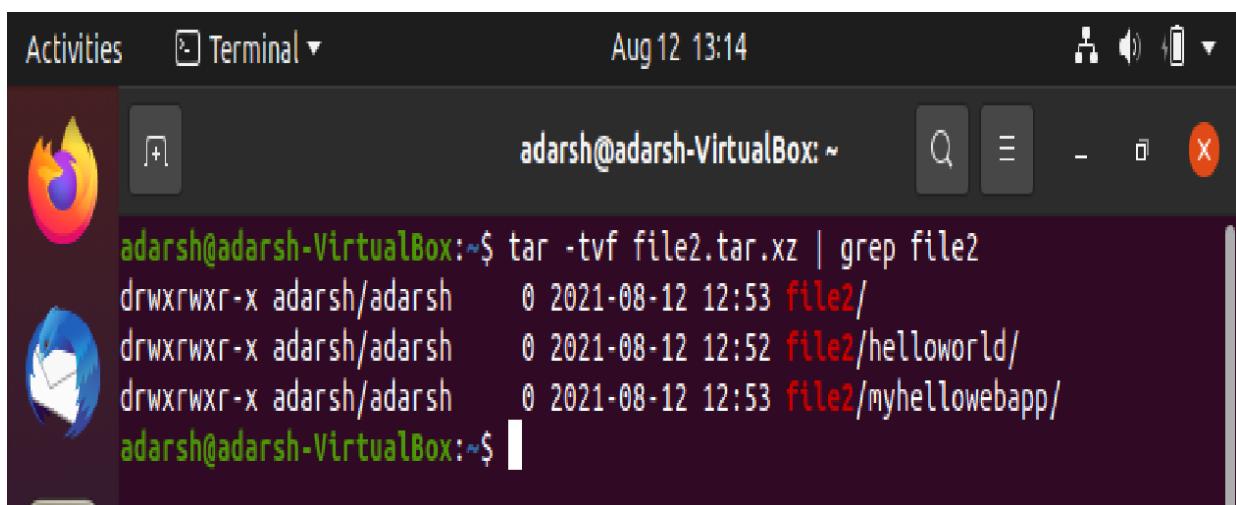


A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "adarsh@adarsh-VirtualBox: ~". The terminal content shows the user running the command "tar -xzvf file2.tar.gz -C /tmp/" to extract the contents of the tar archive "file2.tar.gz" into the directory "/tmp/".

```
adarsh@adarsh-VirtualBox:~$ tar -xzvf file2.tar.gz -C /tmp/
home/adarsh/file2/
home/adarsh/file2/helloworld/
home/adarsh/file2/myhelloworldapp/
adarsh@adarsh-VirtualBox:~$
```

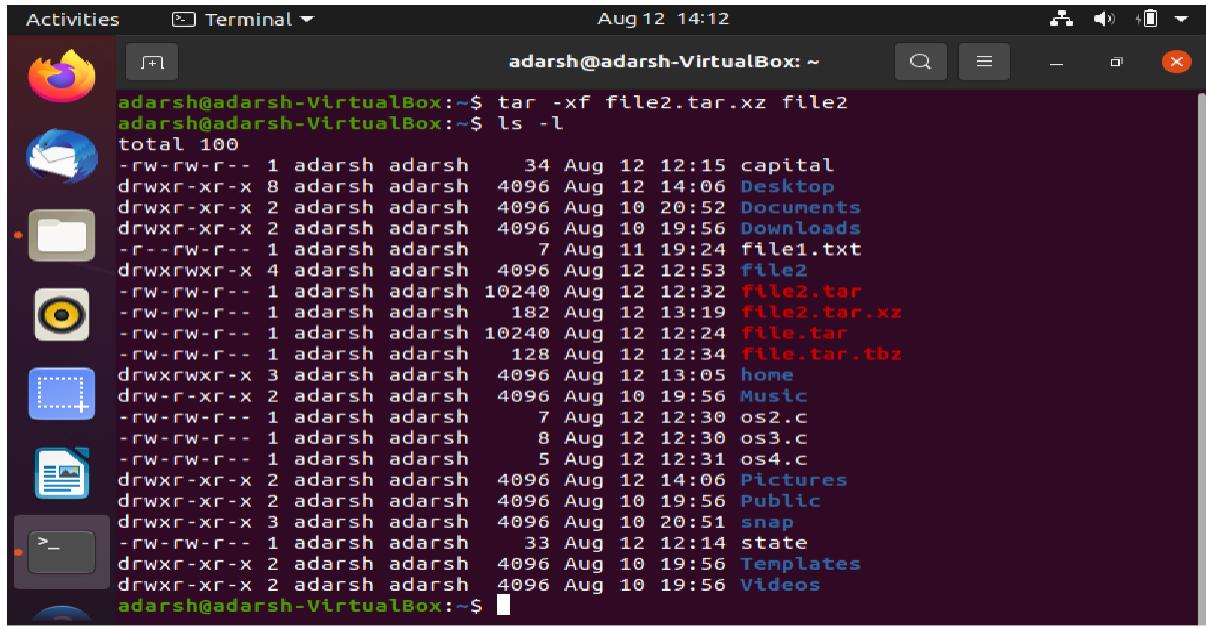
## 2.2 tar.xz (xz)

The tar command and xz command provides support for extracting and uncompressed **tar.xz** files and **.txz** archives under Linux operating systems.



A screenshot of a Linux desktop environment showing a terminal window. The terminal title is "adarsh@adarsh-VirtualBox: ~". The terminal content shows the user running the command "tar -tvf file2.tar.xz | grep file2" to list the contents of the tar.xz archive "file2.tar.xz".

```
adarsh@adarsh-VirtualBox:~$ tar -tvf file2.tar.xz | grep file2
drwxrwxr-x adarsh/adarsh    0 2021-08-12 12:53 file2/
drwxrwxr-x adarsh/adarsh    0 2021-08-12 12:52 file2/helloworld/
drwxrwxr-x adarsh/adarsh    0 2021-08-12 12:53 file2/myhelloworldapp/
adarsh@adarsh-VirtualBox:~$
```



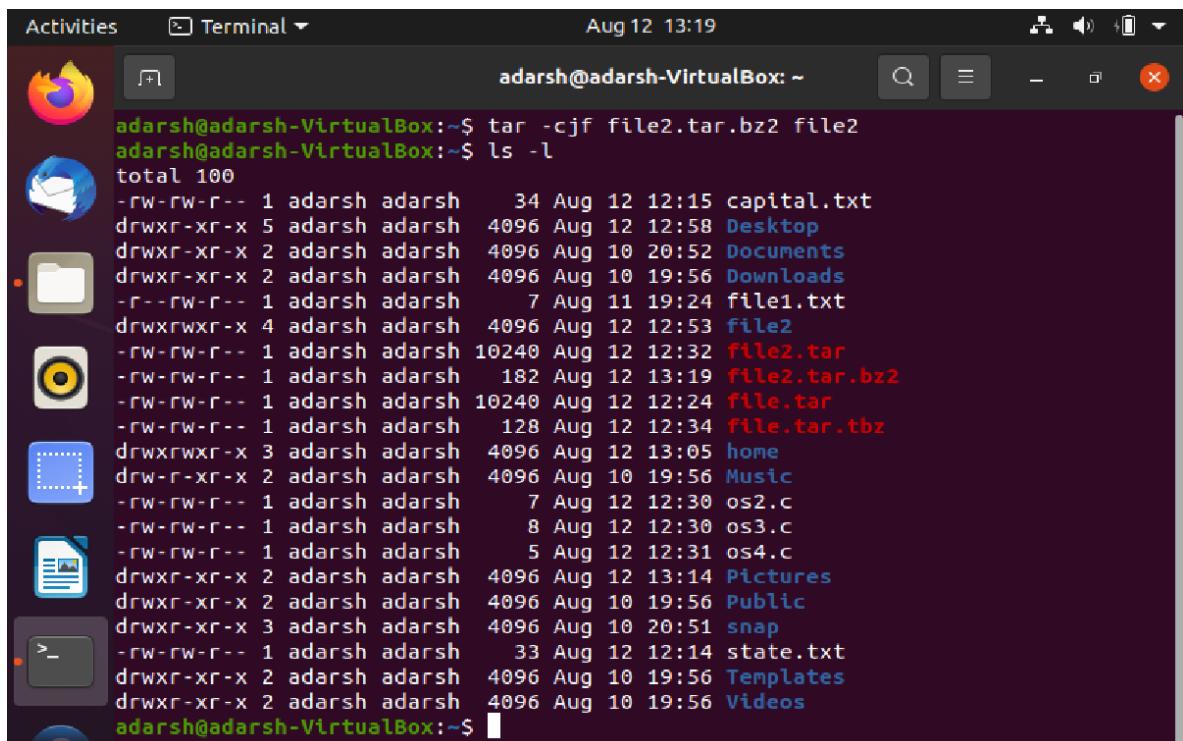
A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window titled "Terminal". The terminal window has a dark background and displays the command "tar -xf file2.tar.xz file2" followed by the output of the "ls -l" command. The output shows a directory structure with files like "capital", "Desktop", "Documents", "Downloads", "file1.txt", "file2", "file2.tar", "file2.tar.xz", "file.tar", "file.tar.tbz", "home", "Music", "os2.c", "os3.c", "os4.c", "Pictures", "Public", "snap", "state", "Templates", and "Videos". The terminal window is part of a larger desktop interface with icons for the Dash, Home, and other applications.

```
adarsh@adarsh-VirtualBox:~$ tar -xf file2.tar.xz file2
adarsh@adarsh-VirtualBox:~$ ls -l
total 100
-rw-rw-r-- 1 adarsh adarsh 34 Aug 12 12:15 capital
drwxr-xr-x 8 adarsh adarsh 4096 Aug 12 14:06 Desktop
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-rw-rw-r-- 1 adarsh adarsh 7 Aug 11 19:24 file1.txt
drwxrwxr-x 4 adarsh adarsh 4096 Aug 12 12:53 file2
-rw-rw-r-- 1 adarsh adarsh 10240 Aug 12 12:32 file2.tar
-rw-rw-r-- 1 adarsh adarsh 182 Aug 12 13:19 file2.tar.xz
-rw-rw-r-- 1 adarsh adarsh 10240 Aug 12 12:24 file.tar
-rw-rw-r-- 1 adarsh adarsh 128 Aug 12 12:34 file.tar.tbz
drwxrwxr-x 3 adarsh adarsh 4096 Aug 12 13:05 home
drw-r-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Music
-rw-rw-r-- 1 adarsh adarsh 7 Aug 12 12:30 os2.c
-rw-rw-r-- 1 adarsh adarsh 8 Aug 12 12:30 os3.c
-rw-rw-r-- 1 adarsh adarsh 5 Aug 12 12:31 os4.c
drwxr-xr-x 2 adarsh adarsh 4096 Aug 12 14:06 Pictures
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Public
drwxr-xr-x 3 adarsh adarsh 4096 Aug 10 20:51 snap
-rw-rw-r-- 1 adarsh adarsh 33 Aug 12 12:14 state
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Templates
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Videos
adarsh@adarsh-VirtualBox:~$
```

## 2.3 tar.bz2 (bzip2)

Gzip is faster, but it generally compresses a bit less, so you get a somewhat larger file. Bzip2 is slower, but it compresses a bit more, so you get a somewhat smaller file. Gzip is also more common, with some stripped-down Linux systems including gzip support by default, but not bzip2 support. In general, though, gzip and bzip2 are practically the same thing and both will work similarly.

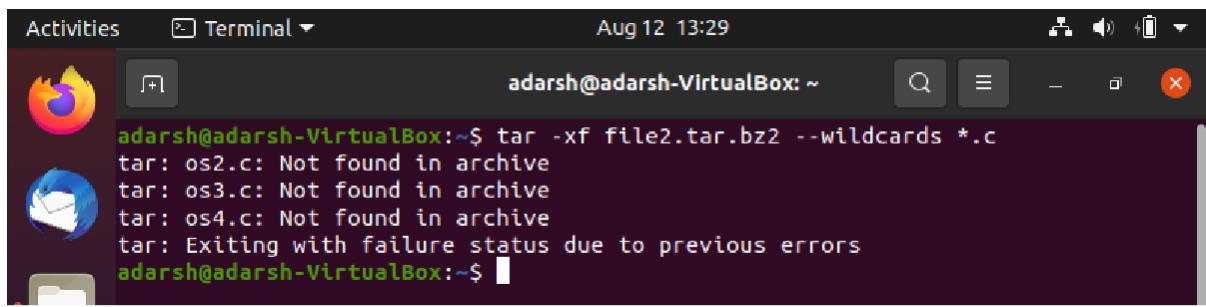
### Create



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window titled "Terminal". The terminal window has a dark background and displays the command "tar -cjf file2.tar.bz2 file2" followed by the output of the "ls -l" command. The output shows a directory structure identical to the one in the previous screenshot, with files like "capital", "Desktop", "Documents", "Downloads", "file1.txt", "file2", "file2.tar", "file2.tar.bz2", "file.tar", "file.tar.tbz", "home", "Music", "os2.c", "os3.c", "os4.c", "Pictures", "Public", "snap", "state", "Templates", and "Videos". The terminal window is part of a larger desktop interface with icons for the Dash, Home, and other applications.

```
adarsh@adarsh-VirtualBox:~$ tar -cjf file2.tar.bz2 file2
adarsh@adarsh-VirtualBox:~$ ls -l
total 100
-rw-rw-r-- 1 adarsh adarsh 34 Aug 12 12:15 capital.txt
drwxr-xr-x 5 adarsh adarsh 4096 Aug 12 12:58 Desktop
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-rw-rw-r-- 1 adarsh adarsh 7 Aug 11 19:24 file1.txt
drwxrwxr-x 4 adarsh adarsh 4096 Aug 12 12:53 file2
-rw-rw-r-- 1 adarsh adarsh 10240 Aug 12 12:32 file2.tar
-rw-rw-r-- 1 adarsh adarsh 182 Aug 12 13:19 file2.tar.bz2
-rw-rw-r-- 1 adarsh adarsh 10240 Aug 12 12:24 file.tar
-rw-rw-r-- 1 adarsh adarsh 128 Aug 12 12:34 file.tar.tbz
drwxrwxr-x 3 adarsh adarsh 4096 Aug 12 13:05 home
drw-r-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Music
-rw-rw-r-- 1 adarsh adarsh 7 Aug 12 12:30 os2.c
-rw-rw-r-- 1 adarsh adarsh 8 Aug 12 12:30 os3.c
-rw-rw-r-- 1 adarsh adarsh 5 Aug 12 12:31 os4.c
drwxr-xr-x 2 adarsh adarsh 4096 Aug 12 13:14 Pictures
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Public
drwxr-xr-x 3 adarsh adarsh 4096 Aug 10 20:51 snap
-rw-rw-r-- 1 adarsh adarsh 33 Aug 12 12:14 state.txt
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Templates
drwxr-xr-x 2 adarsh adarsh 4096 Aug 10 19:56 Videos
adarsh@adarsh-VirtualBox:~$
```

## Extract



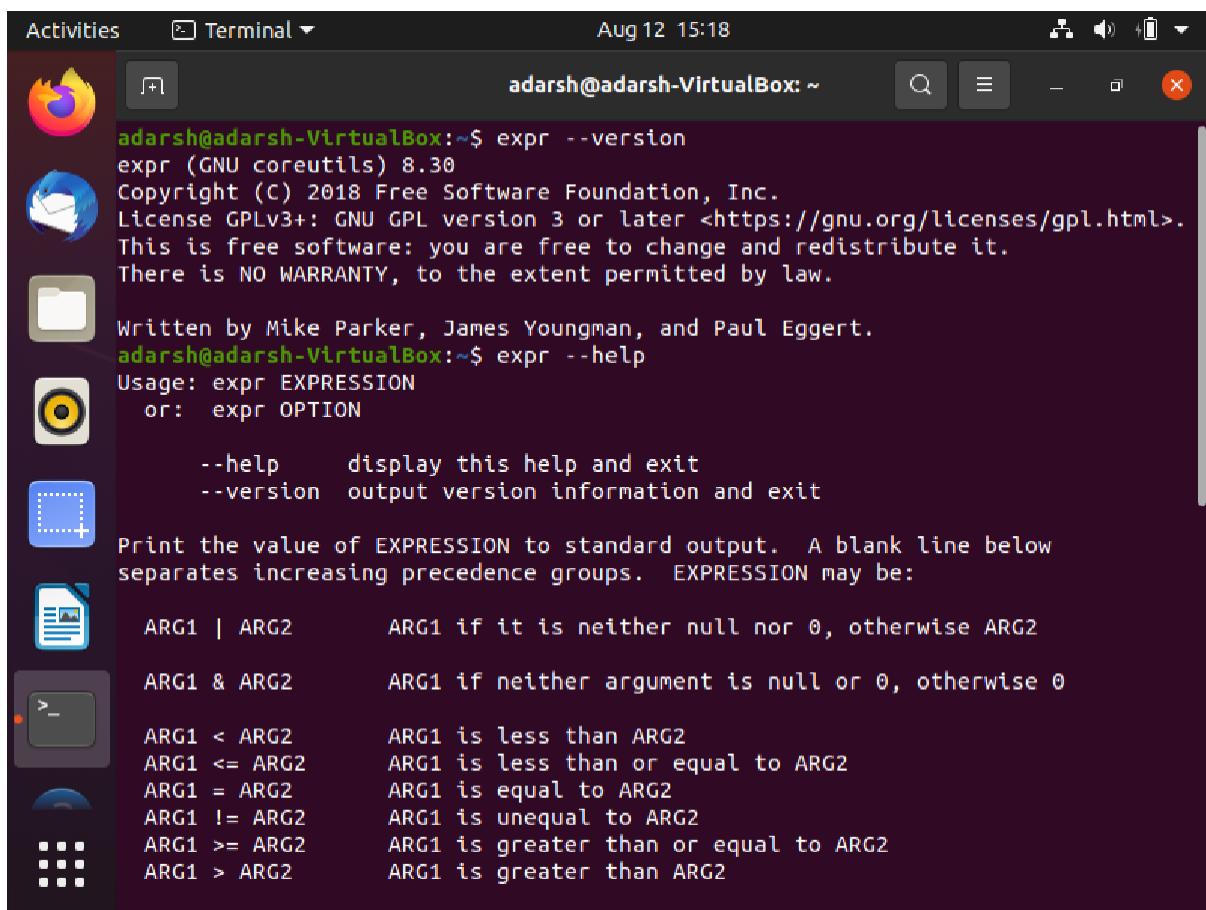
A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal" and the command line shows:

```
adarsh@adarsh-VirtualBox:~$ tar -xf file2.tar.bz2 --wildcards *.c
tar: os2.c: Not found in archive
tar: os3.c: Not found in archive
tar: os4.c: Not found in archive
tar: Exiting with failure status due to previous errors
adarsh@adarsh-VirtualBox:~$
```

## 3.expr

The **expr** command in Unix 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.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal" and the command line shows the usage information for the **expr** command:

```
adarsh@adarsh-VirtualBox:~$ expr --version
expr (GNU coreutils) 8.30
Copyright (C) 2018 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Mike Parker, James Youngman, and Paul Eggert.
adarsh@adarsh-VirtualBox:~$ expr --help
Usage: expr EXPRESSION
      or: expr OPTION

      --help      display this help and exit
      --version   output version information and exit

Print the value of EXPRESSION to standard output. A blank line below
separates increasing precedence groups. EXPRESSION may be:

      ARG1 | ARG2      ARG1 if it is neither null nor 0, otherwise ARG2
      ARG1 & ARG2      ARG1 if neither argument is null or 0, otherwise 0
      ARG1 < ARG2      ARG1 is less than ARG2
      ARG1 <= ARG2     ARG1 is less than or equal to ARG2
      ARG1 = ARG2      ARG1 is equal to ARG2
      ARG1 != ARG2     ARG1 is unequal to ARG2
      ARG1 >= ARG2     ARG1 is greater than or equal to ARG2
      ARG1 > ARG2      ARG1 is greater than ARG2
```

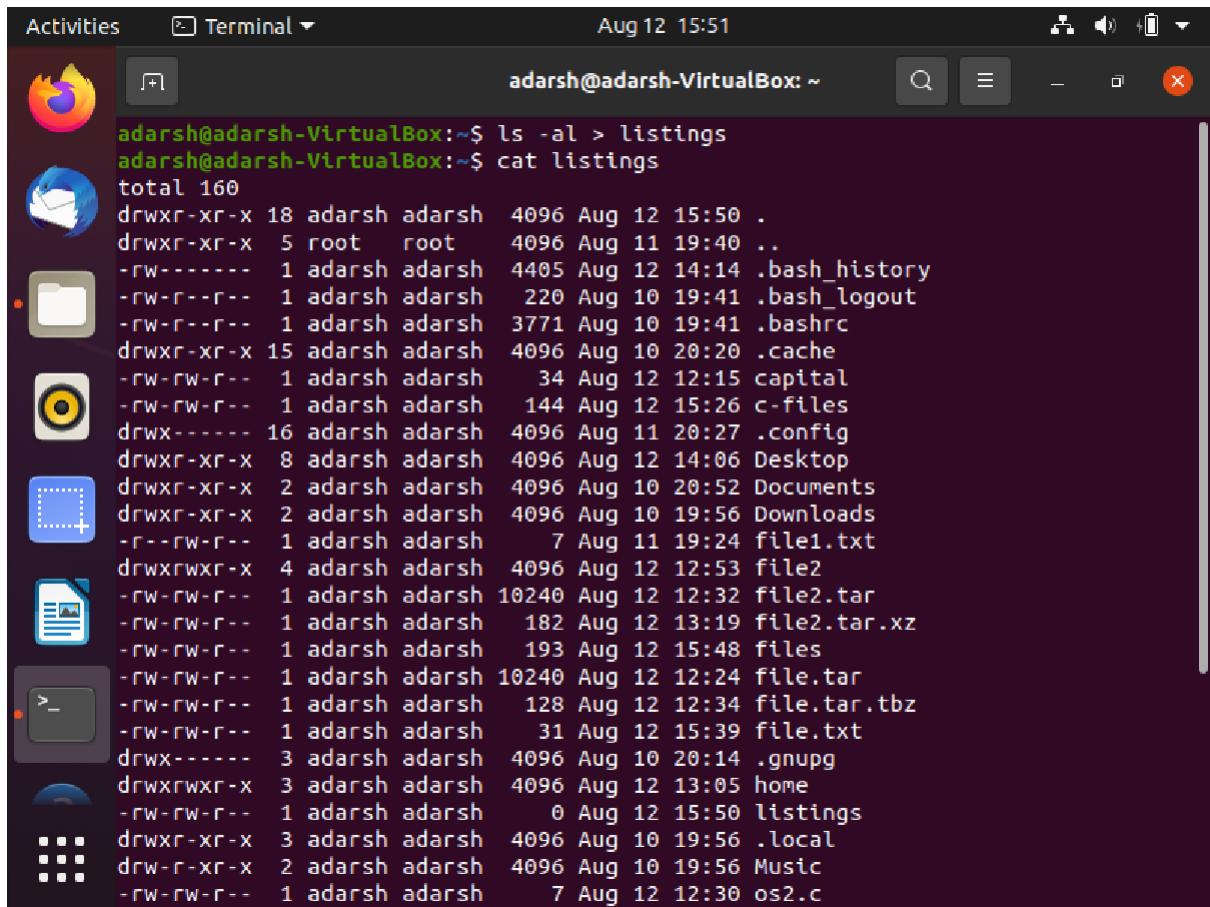


A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window title is "Terminal" and the user is "adarsh@adarsh-VirtualBox". The terminal shows the following command-line session:

```
adarsh@adarsh-VirtualBox:~$ expr 12 + 8
20
adarsh@adarsh-VirtualBox:~$ expr 12 \* 2
24
adarsh@adarsh-VirtualBox:~$ expr 20 - 10
10
adarsh@adarsh-VirtualBox:~$
```

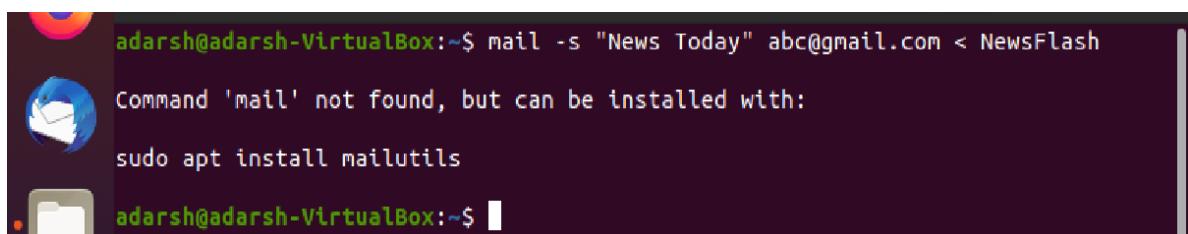
## 4.1 redirection

Redirection is a feature in Linux such that when executing a command, you can change the standard input/output devices. The basic workflow of any Linux command is that it takes an input and give an output.



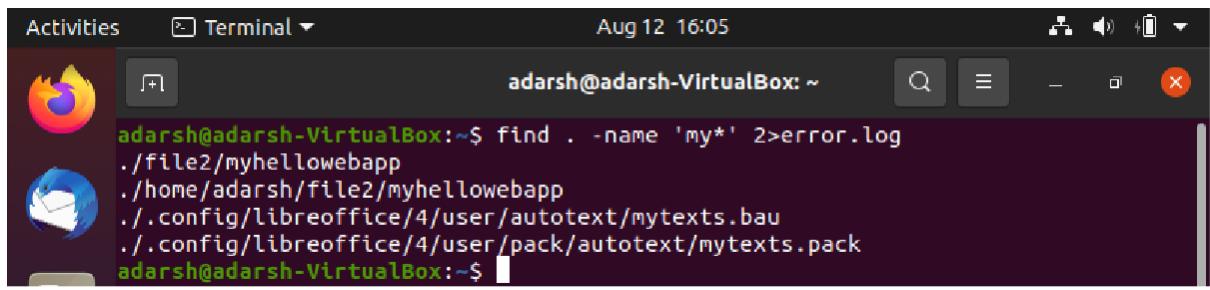
A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window title is "Terminal" and the user is "adarsh@adarsh-VirtualBox". The terminal shows the following command-line session:

```
adarsh@adarsh-VirtualBox:~$ ls -al > listings
adarsh@adarsh-VirtualBox:~$ cat listings
total 160
drwxr-xr-x 18 adarsh adarsh 4096 Aug 12 15:50 .
drwxr-xr-x  5 root   root   4096 Aug 11 19:40 ..
-rw-------  1 adarsh adarsh  4405 Aug 12 14:14 .bash_history
-rw-r--r--  1 adarsh adarsh  220 Aug 10 19:41 .bash_logout
-rw-r--r--  1 adarsh adarsh 3771 Aug 10 19:41 .bashrc
drwxr-xr-x 15 adarsh adarsh 4096 Aug 10 20:20 .cache
-rw-rw-r--  1 adarsh adarsh   34 Aug 12 12:15 capital
-rw-rw-r--  1 adarsh adarsh  144 Aug 12 15:26 c-files
drwx----- 16 adarsh adarsh 4096 Aug 11 20:27 .config
drwxr-xr-x  8 adarsh adarsh 4096 Aug 12 14:06 Desktop
drwxr-xr-x  2 adarsh adarsh 4096 Aug 10 20:52 Documents
drwxr-xr-x  2 adarsh adarsh 4096 Aug 10 19:56 Downloads
-rw-rw-r--  1 adarsh adarsh    7 Aug 11 19:24 file1.txt
drwxrwxr-x  4 adarsh adarsh 4096 Aug 12 12:53 file2
-rw-rw-r--  1 adarsh adarsh 10240 Aug 12 12:32 file2.tar
-rw-rw-r--  1 adarsh adarsh  182 Aug 12 13:19 file2.tar.xz
-rw-rw-r--  1 adarsh adarsh  193 Aug 12 15:48 files
-rw-rw-r--  1 adarsh adarsh 10240 Aug 12 12:24 file.tar
-rw-rw-r--  1 adarsh adarsh  128 Aug 12 12:34 file.tar.tbz
-rw-rw-r--  1 adarsh adarsh   31 Aug 12 15:39 file.txt
drwx----- 3 adarsh adarsh 4096 Aug 10 20:14 .gnupg
drwxrwxr-x  3 adarsh adarsh 4096 Aug 12 13:05 home
-rw-rw-r--  1 adarsh adarsh     0 Aug 12 15:50 listings
drwxr-xr-x  3 adarsh adarsh 4096 Aug 10 19:56 .local
drw-r-xr-x  2 adarsh adarsh 4096 Aug 10 19:56 Music
-rw-rw-r--  1 adarsh adarsh    7 Aug 12 12:30 os2.c
```



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window title is "Terminal" and the user is "adarsh@adarsh-VirtualBox". The terminal shows the following command-line session:

```
adarsh@adarsh-VirtualBox:~$ mail -s "News Today" abc@gmail.com < NewsFlash
Command 'mail' not found, but can be installed with:
sudo apt install mailutils
adarsh@adarsh-VirtualBox:~$
```

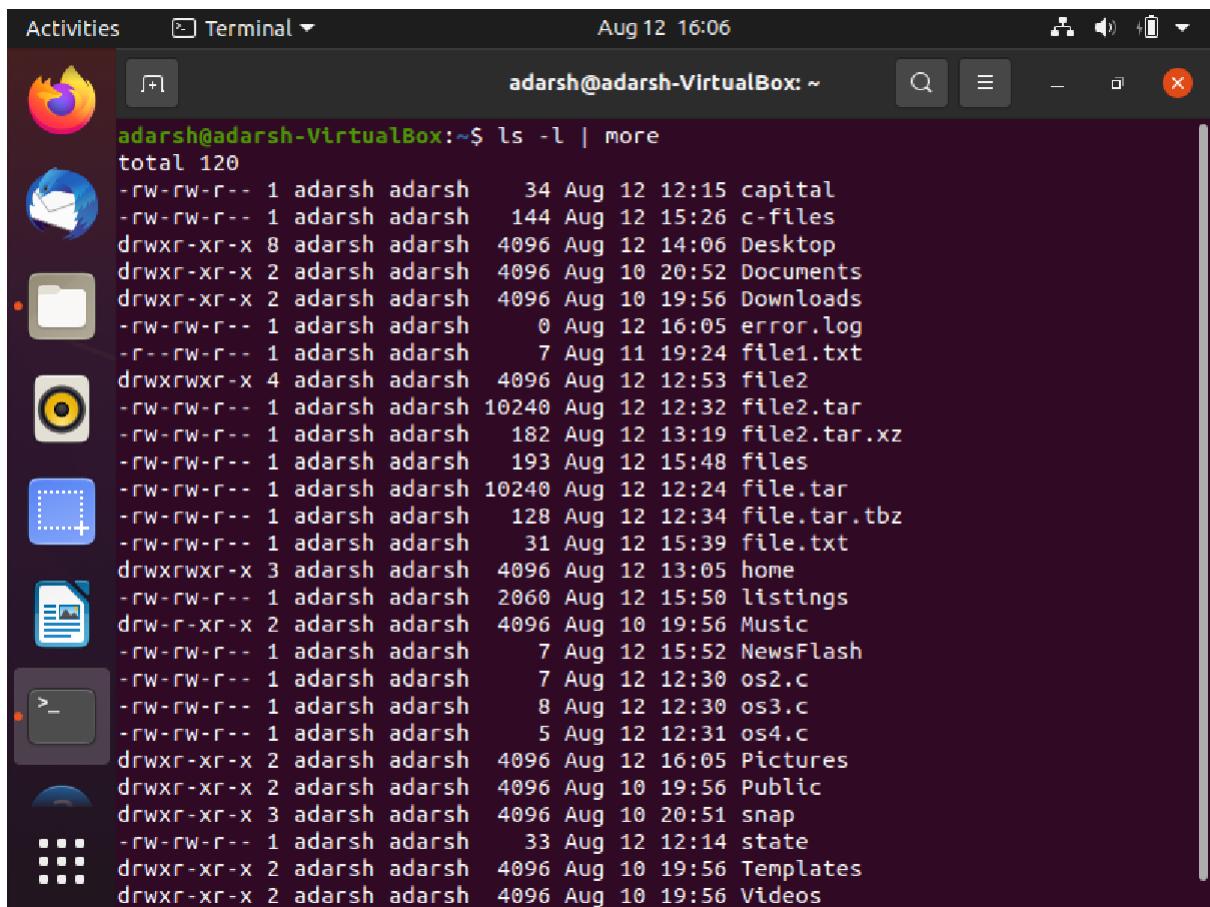


A screenshot of a Linux desktop environment (Ubuntu) showing a terminal window. The terminal window title is "Terminal" and the date and time are "Aug 12 16:05". The command entered is "find . -name 'my\*' 2>error.log". The output shows the path to a file named "myhelloworldapp".

```
adarsh@adarsh-VirtualBox:~$ find . -name 'my*' 2>error.log
./file2/myhelloworldapp
./home/adarsh/file2/myhelloworldapp
./.config/libreoffice/4/user/autotext/mytexts.bau
./.config/libreoffice/4/user/pack/autotext/mytexts.pack
adarsh@adarsh-VirtualBox:~$
```

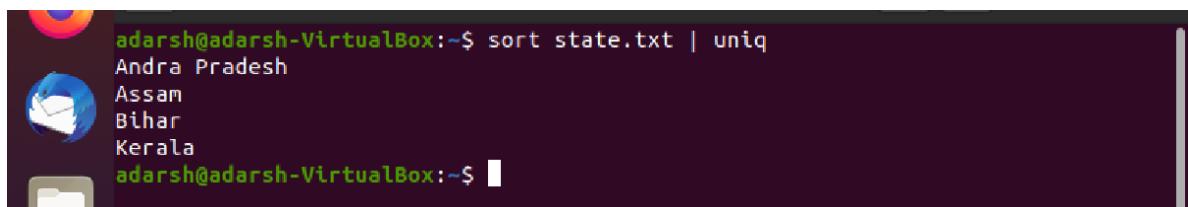
## 4.2 piping

A pipe is a form of redirection (transfer of standard output to some other destination) that is used in Linux and other Unix-like operating systems to send the output of one command/program/process to another command/program/process for further processing. The Unix/Linux systems allow stdout of a command to be connected to stdin of another command. You can make it do so by using the pipe character '|'.



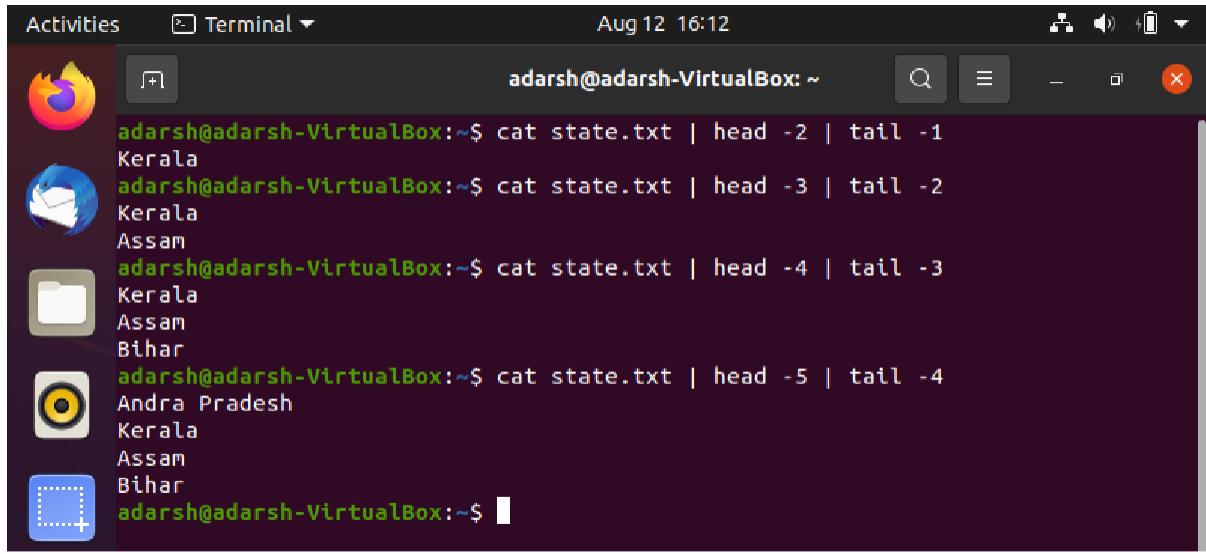
A screenshot of a Linux desktop environment (Ubuntu) showing a terminal window. The terminal window title is "Terminal" and the date and time are "Aug 12 16:06". The command entered is "ls -l | more". The output is a long list of files and directories in the current directory.

```
adarsh@adarsh-VirtualBox:~$ ls -l | more
total 120
-rw-rw-r-- 1 adarsh adarsh    34 Aug 12 12:15 capital
-rw-rw-r-- 1 adarsh adarsh   144 Aug 12 15:26 c-files
drwxr-xr-x  8 adarsh adarsh  4096 Aug 12 14:06 Desktop
drwxr-xr-x  2 adarsh adarsh  4096 Aug 10 20:52 Documents
drwxr-xr-x  2 adarsh adarsh  4096 Aug 10 19:56 Downloads
-rw-rw-r--  1 adarsh adarsh     0 Aug 12 16:05 error.log
-rw-rw-r--  1 adarsh adarsh     7 Aug 11 19:24 file1.txt
drwxrwxr-x  4 adarsh adarsh  4096 Aug 12 12:53 file2
-rw-rw-r--  1 adarsh adarsh 10240 Aug 12 12:32 file2.tar
-rw-rw-r--  1 adarsh adarsh   182 Aug 12 13:19 file2.tar.xz
-rw-rw-r--  1 adarsh adarsh   193 Aug 12 15:48 files
-rw-rw-r--  1 adarsh adarsh 10240 Aug 12 12:24 file.tar
-rw-rw-r--  1 adarsh adarsh   128 Aug 12 12:34 file.tar.tbz
-rw-rw-r--  1 adarsh adarsh    31 Aug 12 15:39 file.txt
drwxrwxr-x  3 adarsh adarsh  4096 Aug 12 13:05 home
-rw-rw-r--  1 adarsh adarsh  2060 Aug 12 15:50 listings
drw-r-xr-x  2 adarsh adarsh  4096 Aug 10 19:56 Music
-rw-rw-r--  1 adarsh adarsh     7 Aug 12 15:52 NewsFlash
-rw-rw-r--  1 adarsh adarsh     7 Aug 12 12:30 os2.c
-rw-rw-r--  1 adarsh adarsh     8 Aug 12 12:30 os3.c
-rw-rw-r--  1 adarsh adarsh     5 Aug 12 12:31 os4.c
drwxr-xr-x  2 adarsh adarsh  4096 Aug 12 16:05 Pictures
drwxr-xr-x  2 adarsh adarsh  4096 Aug 10 19:56 Public
drwxr-xr-x  3 adarsh adarsh  4096 Aug 10 20:51 snap
-rw-rw-r--  1 adarsh adarsh    33 Aug 12 12:14 state
drwxr-xr-x  2 adarsh adarsh  4096 Aug 10 19:56 Templates
drwxr-xr-x  2 adarsh adarsh  4096 Aug 10 19:56 Videos
```



A screenshot of a Linux desktop environment (Ubuntu) showing a terminal window. The terminal window title is "Terminal" and the date and time are "Aug 12 16:06". The command entered is "sort state.txt | uniq". The output shows unique state names from a file named "state.txt".

```
adarsh@adarsh-VirtualBox:~$ sort state.txt | uniq
Andra Pradesh
Assam
Bihar
Kerala
adarsh@adarsh-VirtualBox:~$
```

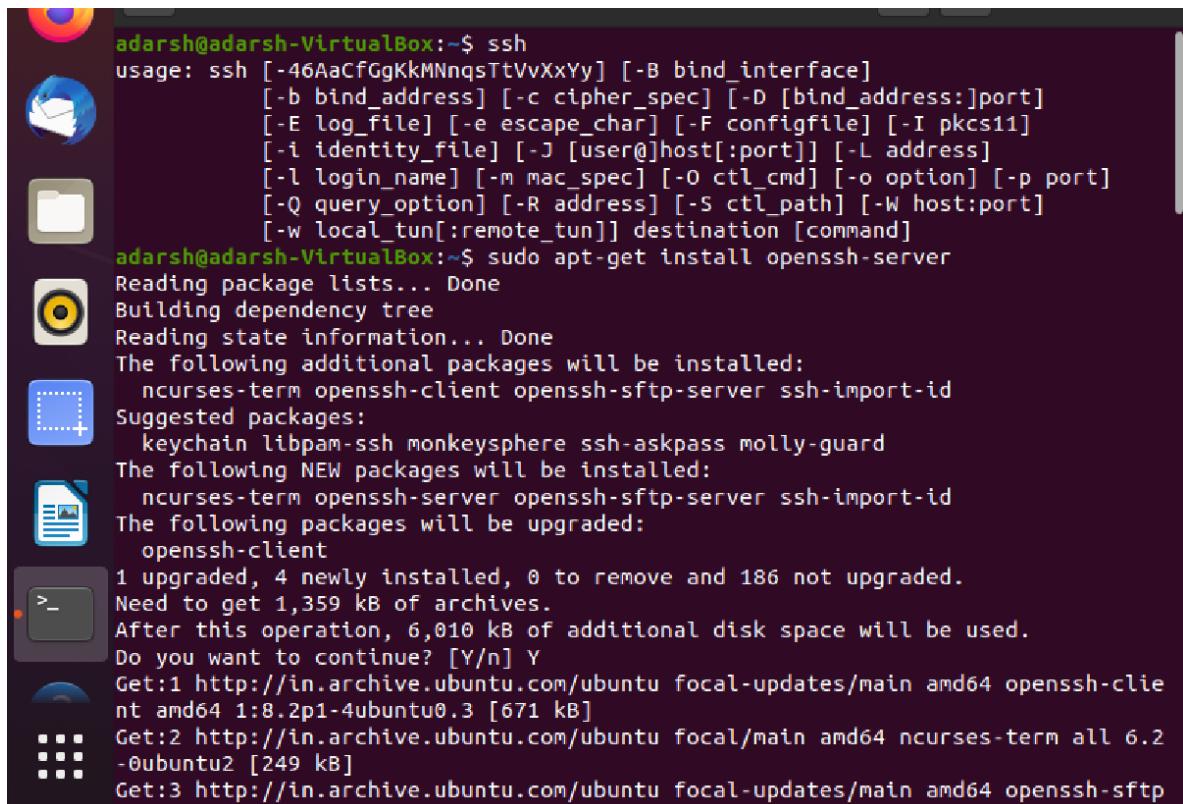


A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window has a dark background and contains the following text:

```
adarsh@adarsh-VirtualBox:~$ cat state.txt | head -2 | tail -1
Kerala
adarsh@adarsh-VirtualBox:~$ cat state.txt | head -3 | tail -2
Kerala
Assam
adarsh@adarsh-VirtualBox:~$ cat state.txt | head -4 | tail -3
Kerala
Assam
Bihar
adarsh@adarsh-VirtualBox:~$ cat state.txt | head -5 | tail -4
Andra Pradesh
Kerala
Assam
Bihar
adarsh@adarsh-VirtualBox:~$
```

## 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.



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window has a dark background and contains the following text:

```
adarsh@adarsh-VirtualBox:~$ ssh
usage: ssh [-46AaCfGgKkMNnqsTtVvXxYy] [-B bind_interface]
           [-b bind_address] [-c cipher_spec] [-D [bind_address:]port]
           [-E log_file] [-e escape_char] [-F configfile] [-I pkcs11]
           [-i identity_file] [-J [user@]host[:port]] [-L address]
           [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
           [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
           [-w local_tun[:remote_tun]] destination [command]
adarsh@adarsh-VirtualBox:~$ sudo apt-get install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ncurses-term openssh-client openssh-sftp-server ssh-import-id
Suggested packages:
  keychain libpam-ssh monkeysphere ssh-askpass molly-guard
The following NEW packages will be installed:
  ncurses-term openssh-server openssh-sftp-server ssh-import-id
The following packages will be upgraded:
  openssh-client
1 upgraded, 4 newly installed, 0 to remove and 186 not upgraded.
Need to get 1,359 kB of archives.
After this operation, 6,010 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-clie
nt amd64 1:8.2p1-4ubuntu0.3 [671 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2
-0ubuntu2 [249 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-sftp
```

Activities Terminal Aug 12 16:52

```
adarsh@adarsh-VirtualBox:~$ sudo service ssh status
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: >
   Active: active (running) since Thu 2021-08-12 16:49:33 IST; 47s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 5629 (sshd)
      Tasks: 1 (limit: 1664)
    Memory: 1.0M
      CGroup: /system.slice/ssh.service
              └─5629 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Aug 12 16:49:33 adarsh-VirtualBox systemd[1]: Starting OpenBSD Secure Shell se...
Aug 12 16:49:33 adarsh-VirtualBox sshd[5629]: Server listening on 0.0.0.0 port...
Aug 12 16:49:33 adarsh-VirtualBox sshd[5629]: Server listening on :: port 22.
Aug 12 16:49:33 adarsh-VirtualBox systemd[1]: Started OpenBSD Secure Shell ser...
adarsh@adarsh-VirtualBox:~$ ssh localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:J1wzwqDmzTi2T2TRG3Sfjl9AFDQDam/2xTwhZwoCE4g.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
adarsh@localhost's password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.11.0-25-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

100 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

Your Hardware Enablement Stack (HWE) is supported until April 2025.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

adarsh@adarsh-VirtualBox:~$
```

Activities Terminal Aug 12 16:53

```
adarsh@adarsh-VirtualBox:~$ sudo service ssh status
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: >
   Active: active (running) since Thu 2021-08-12 16:49:33 IST; 47s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 5629 (sshd)
      Tasks: 1 (limit: 1664)
    Memory: 1.0M
      CGroup: /system.slice/ssh.service
              └─5629 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Aug 12 16:49:33 adarsh-VirtualBox sshd[5629]: Server listening on 0.0.0.0 port...
Aug 12 16:49:33 adarsh-VirtualBox sshd[5629]: Server listening on :: port 22.
Aug 12 16:49:33 adarsh-VirtualBox systemd[1]: Started OpenBSD Secure Shell ser...
adarsh@adarsh-VirtualBox:~$ ssh localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:J1wzwqDmzTi2T2TRG3Sfjl9AFDQDam/2xTwhZwoCE4g.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
adarsh@localhost's password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.11.0-25-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

188 updates can be installed immediately.
0 of these updates are security updates.
To see these additional updates run: apt list --upgradable

Your Hardware Enablement Stack (HWE) is supported until April 2025.

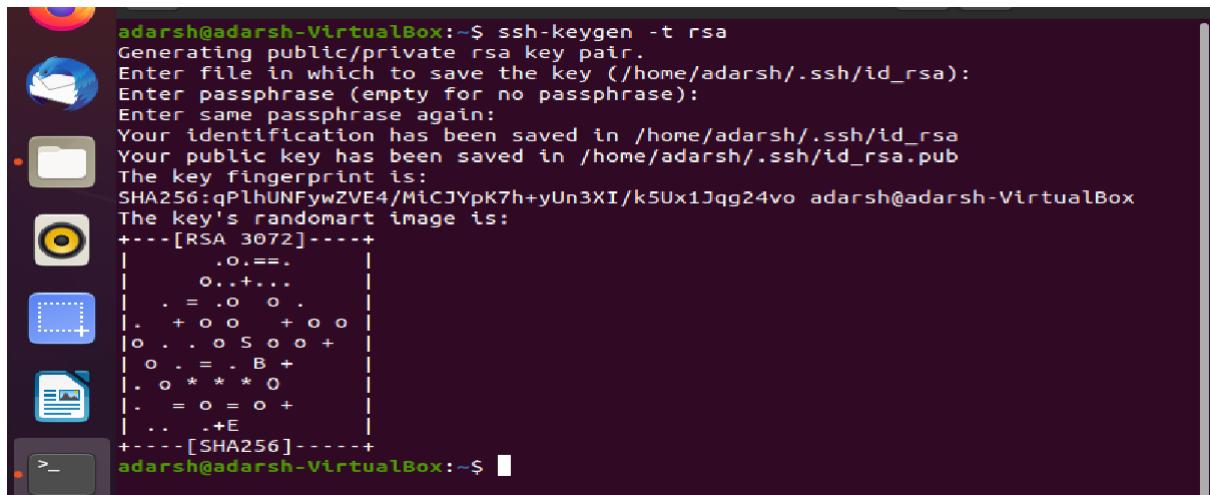
The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

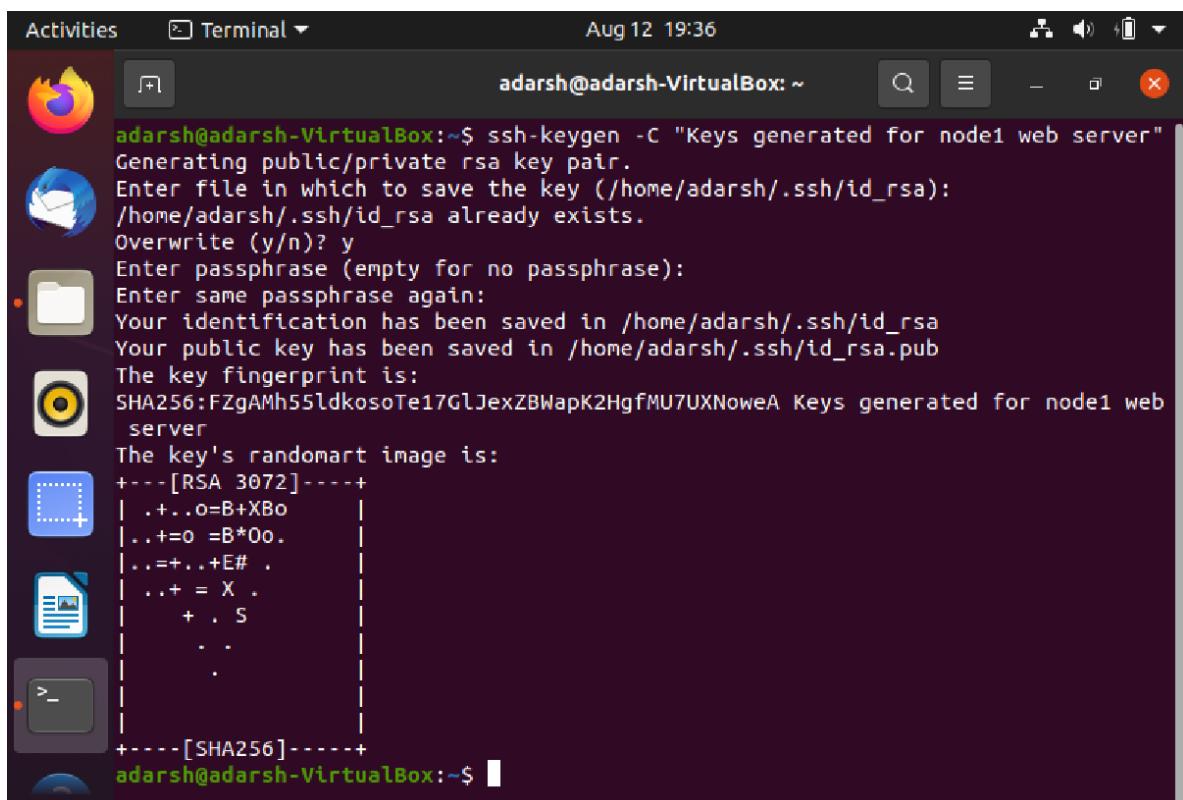
adarsh@adarsh-VirtualBox:~$
```

## 6.ssh-keygen

Use the ssh-keygen command to generate a public/private authentication 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.



```
adarsh@adarsh-VirtualBox:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/adarsh/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/adarsh/.ssh/id_rsa
Your public key has been saved in /home/adarsh/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:qPlhUNFywzVE4/MiCJYpk7h+yUn3XI/k5Ux1Jqq24vo adarsh@adarsh-VirtualBox
The key's randomart image is:
+---[RSA 3072]---+
| .o==. |
| o...+.. |
| . = .o o . |
| . + o o + o o |
| o .. o S o o + |
| o .. = . B + |
| . o * * * o |
| . = o = o + |
| ... .+E |
+---[SHA256]---+
adarsh@adarsh-VirtualBox:~$
```



```
Activities Terminal Aug 12 19:36
adarsh@adarsh-VirtualBox:~$ ssh-keygen -C "Keys generated for node1 web server"
Generating public/private rsa key pair.
Enter file in which to save the key (/home/adarsh/.ssh/id_rsa):
/home/adarsh/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/adarsh/.ssh/id_rsa
Your public key has been saved in /home/adarsh/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:FZgAMh55ldkosoTe17GlJexZBwapK2HgfMU7UXNoweA Keys generated for node1 web
server
The key's randomart image is:
+---[RSA 3072]---+
| .+..o=B+XBo |
| ...+=o =B*Oo. |
| ...=+..+E# . |
| ...+ = X . |
| + . S |
| . . |
| . . |
+---[SHA256]---+
adarsh@adarsh-VirtualBox:~$
```

Activities Terminal Aug 12 19:37

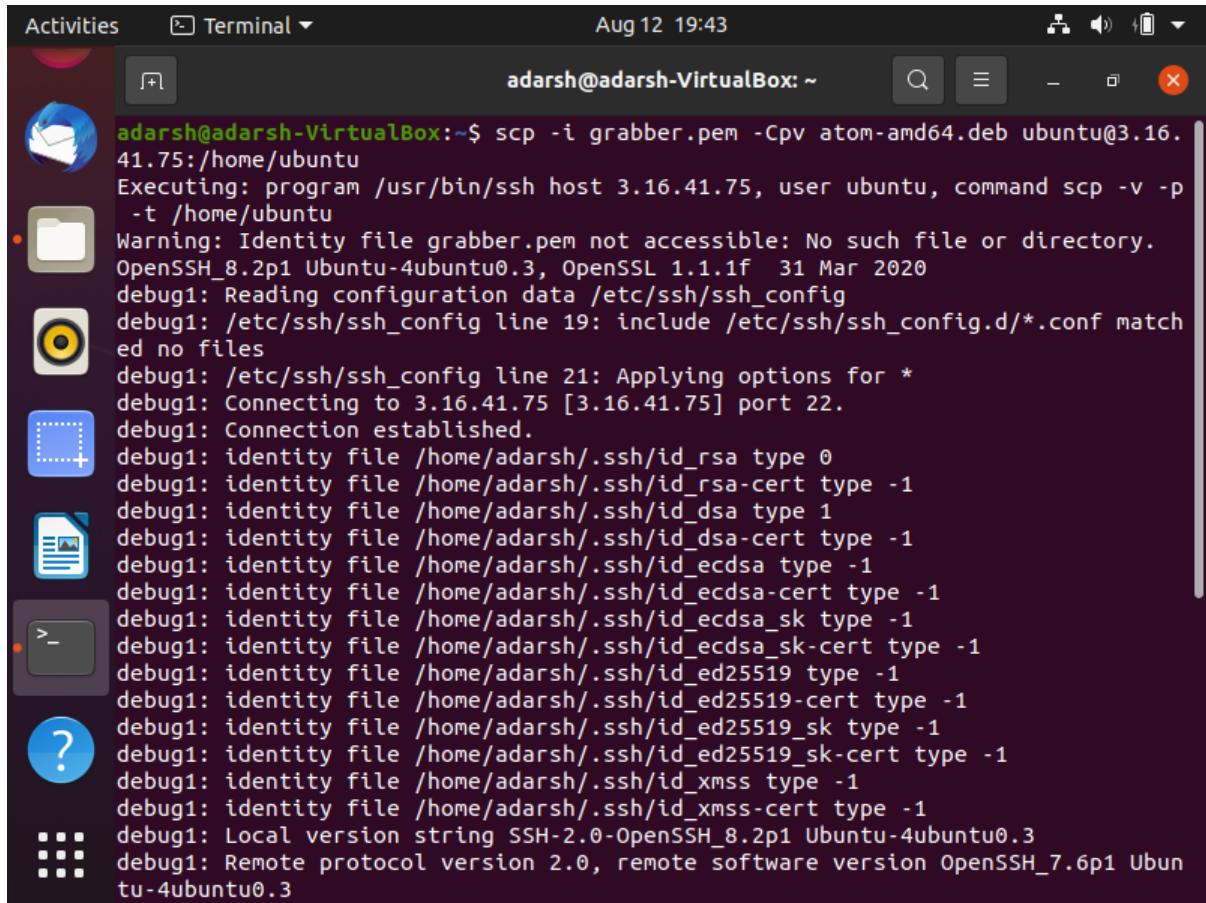
```
adarsh@adarsh-VirtualBox:~$ ssh-keygen -e
Enter file in which the key is (/home/adarsh/.ssh/id_rsa):
---- BEGIN SSH2 PUBLIC KEY ----
Comment: "3072-bit RSA, converted by adarsh@adarsh-VirtualBox from OpenSSH"
AAAAB3NzaC1yc2EAAAQABAAQgQD0Ke8vp8WFQbopthqzZaX/WWctUfZEsv8x8pVjG
cAhbwkt7Tzai2bTXT+g7bX0jT266qVx4k6qF+x+ablN2pRxev0+XuitD4Iaa71G8aLZLAcr
rxQbIScuAZiZ8uoWxbVVaePiGqpV1TdDDbaPRzaAgnbZJvymSwLD20/4tcYCjNOiezPN
BifNECv65T2Auy46tlAFbU/RUENidsvbCSMhvgnDvbJQyelRTDIjnDe7i06Jj3KsB+sP1m
XAQMclneJIZY28tgX7DLR4uomhobzGhKTkRA2MJfukkVveokdNarlxdPTgig7FINMfhQI
qxolZ93yVgcefaggJlyyksyE0VNEfdkiYoDROeHf7vSAYkHj7TD/BZNBBQqIkMIjfN3FBiD
DITQ81GsueRsLrwRMfftIGOozBitMelWK39lQ38rc18fFVw8136m8pJpD9mtpjPa47fuqC
db0+vesdUBTVDL86Ne2s1ZLlByDeyS8AuGPRJSjtQDtBH8UTG01eU=
---- END SSH2 PUBLIC KEY ----
adarsh@adarsh-VirtualBox:~$
```

Activities Terminal Aug 12 19:38

```
adarsh@adarsh-VirtualBox:~$ ssh-keygen -y
Enter file in which the key is (/home/adarsh/.ssh/id_rsa):
ssh-rsa AAAAB3NzaC1yc2EAAAQABAAQgQD0Ke8vp8WFQbopthqzZaX/WWctUfZEsv8x8pVjG
cAhbwkt7Tzai2bTXT+g7bX0jT266qVx4k6qF+x+ablN2pRxev0+XuitD4Iaa71G8aLZLAcr
rxQbIScuAZiZ8uoWxbVVaePiGqpV1TdDDbaPRzaAgnbZJvymSwLD20/4tcYCjNOiezPN
BifNECv65T2Auy46tlAFbU/RUENidsvbCSMhvgnDvbJQyelRTDIjnDe7i06Jj3KsB+sP1m
XAQMclneJIZY28tgX7DLR4uomhobzGhKTkRA2MJfukkVveokdNarlxdPTgig7FINMfhQI
qxolZ93yVgcefaggJlyyksyE0VNEfdkiYoDROeHf7vSAYkHj7TD/BZNBBQqIkMIjfN3FBiD
DITQ81GsueRsLrwRMfftIGOozBitMelWK39lQ38rc18fFVw8136m8pJpD9mtpjPa47fuqC
db0+vesdUBTVDL86Ne2s1ZLlByDeyS8AuGPRJSjtQDtBH8UTG01eU=
Keys generated for node1 web server
adarsh@adarsh-VirtualBox:~$
```

## 7.scp

scp (secure copy) command in Linux system is used to copy file(s) between servers in a secure way. The SCP command or secure copy allows secure transferring of files in between the local host and the remote host or between two remote hosts. It uses the same authentication and security as it is used in the Secure Shell (SSH) protocol. SCP is known for its simplicity, security and pre-installed availability.

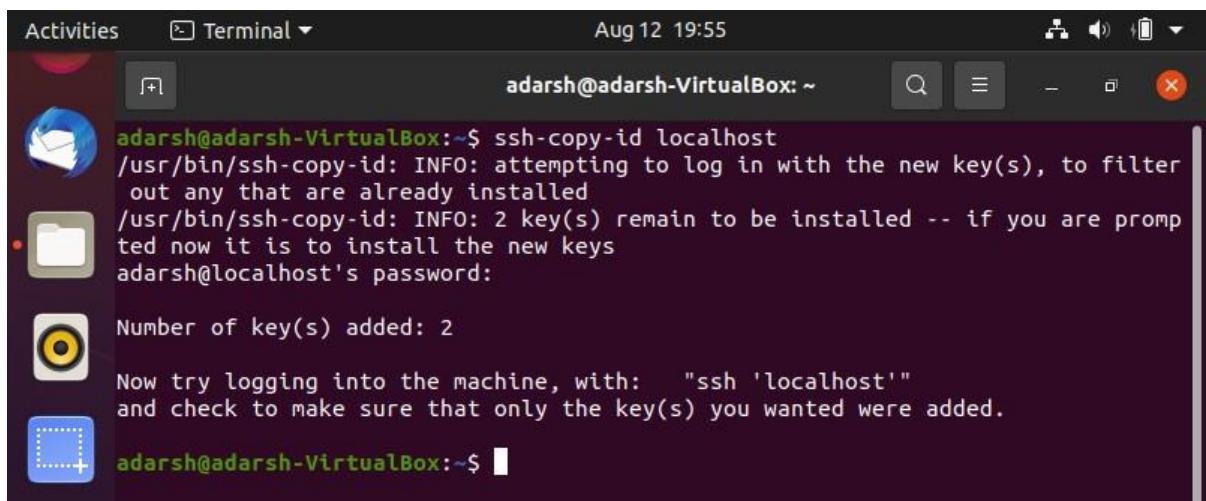


A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window title is "Terminal" and the prompt is "adarsh@adarsh-VirtualBox:~\$". The terminal shows the following command and its output:

```
adarsh@adarsh-VirtualBox:~$ scp -i grabber.pem -Cpv atom-amd64.deb ubuntu@3.16.41.75:/home/ubuntu
Executing: program /usr/bin/ssh host 3.16.41.75, user ubuntu, command scp -v -p
-t /home/ubuntu
Warning: Identity file grabber.pem not accessible: No such file or directory.
OpenSSH_8.2p1 Ubuntu-4ubuntu0.3, OpenSSL 1.1.1f  31 Mar 2020
debug1: Reading configuration data /etc/ssh/ssh_config
debug1: /etc/ssh/ssh_config line 19: include /etc/ssh/ssh_config.d/*.conf matched no files
debug1: /etc/ssh/ssh_config line 21: Applying options for *
debug1: Connecting to 3.16.41.75 [3.16.41.75] port 22.
debug1: Connection established.
debug1: identity file /home/adarsh/.ssh/id_rsa type 0
debug1: identity file /home/adarsh/.ssh/id_rsa-cert type -1
debug1: identity file /home/adarsh/.ssh/id_dsa type 1
debug1: identity file /home/adarsh/.ssh/id_dsa-cert type -1
debug1: identity file /home/adarsh/.ssh/id_ecdsa type -1
debug1: identity file /home/adarsh/.ssh/id_ecdsa-cert type -1
debug1: identity file /home/adarsh/.ssh/id_ecdsa_sk type -1
debug1: identity file /home/adarsh/.ssh/id_ecdsa_sk-cert type -1
debug1: identity file /home/adarsh/.ssh/id_ed25519 type -1
debug1: identity file /home/adarsh/.ssh/id_ed25519-cert type -1
debug1: identity file /home/adarsh/.ssh/id_ed25519_sk type -1
debug1: identity file /home/adarsh/.ssh/id_ed25519_sk-cert type -1
debug1: identity file /home/adarsh/.ssh/id_xmss type -1
debug1: identity file /home/adarsh/.ssh/id_xmss-cert type -1
debug1: Local version string SSH-2.0-OpenSSH_8.2p1 Ubuntu-4ubuntu0.3
debug1: Remote protocol version 2.0, remote software version OpenSSH_7.6p1 Ubuntu-4ubuntu0.3
```

## 8.ssh-copy-id

ssh-copy-id uses the **SSH protocol** to connect to the target host and upload the SSH user key. The command edits the authorized\_keys file on the server. It creates the .ssh directory if it doesn't exist.



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window title is "Terminal" and the prompt is "adarsh@adarsh-VirtualBox:~\$". The terminal shows the following command and its output:

```
adarsh@adarsh-VirtualBox:~$ ssh-copy-id localhost
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
out any that are already installed
/usr/bin/ssh-copy-id: INFO: 2 key(s) remain to be installed -- if you are prompted now it is to install the new keys
adarsh@localhost's password:

Number of key(s) added: 2

Now try logging into the machine, with:  "ssh 'localhost'"
and check to make sure that only the key(s) you wanted were added.

adarsh@adarsh-VirtualBox:~$
```

# **ASSIGNMENT**

**NETWORKING&SYSTEM ADMINISTRATION LAB**

**SUBMITTED BY**

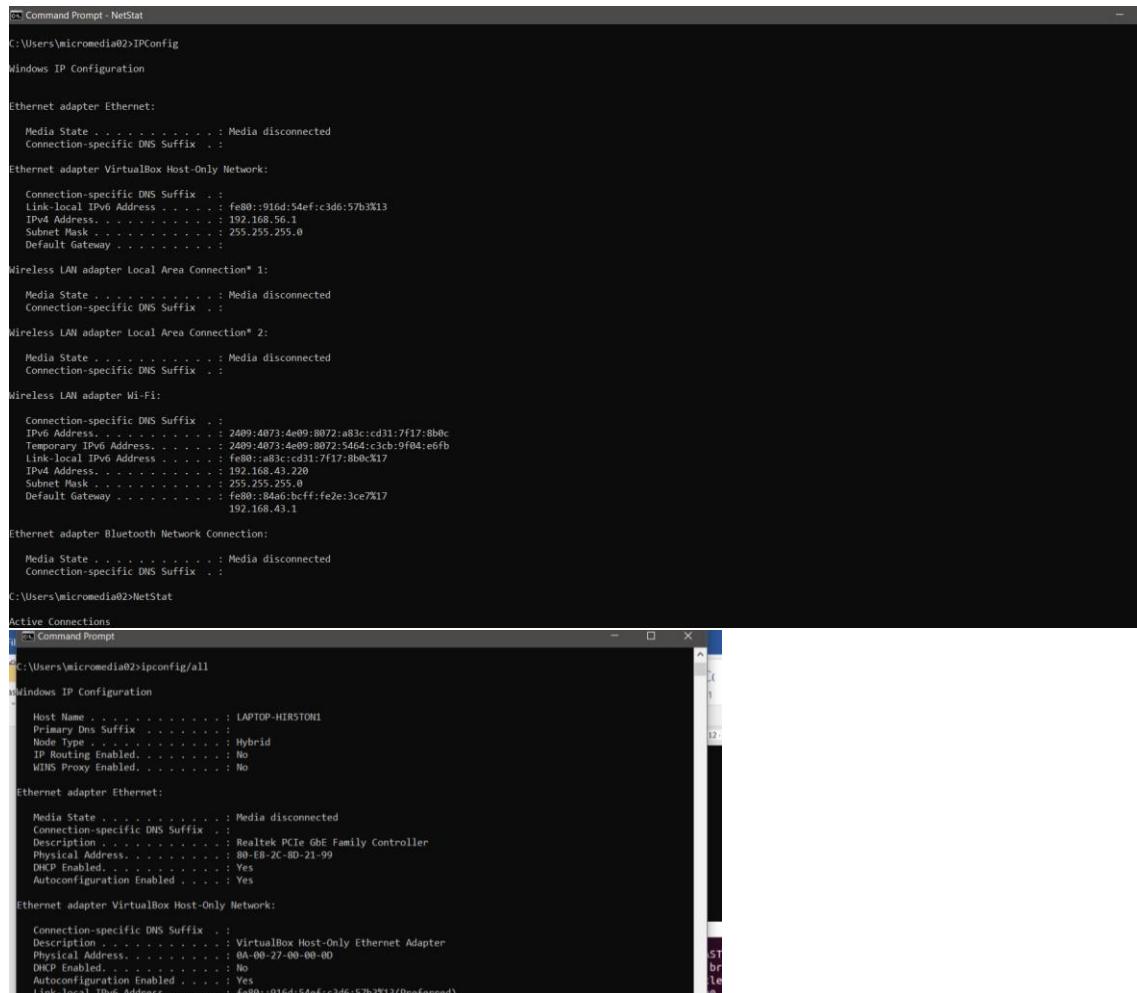
**ADARSH S**

**S2RMCA : A**

**ROLL NO : 03**

1. Try out these network commands in Windows as well as in Linux and perform at least 4 options with each command: ping route traceroute, nslookup, Ip Config, NetStat

### Ipconfig



```
C:\Users\micromedia02>IPConfig
Windows IP Configuration

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

Ethernet adapter VirtualBox Host-Only Network:
  Connection-specific DNS Suffix . :
  Link-local IPv6 Address . . . . . : fe80::916d:5def:c3d6:57b3%13
  IPv4 Address . . . . . : 192.168.56.1
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 1:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

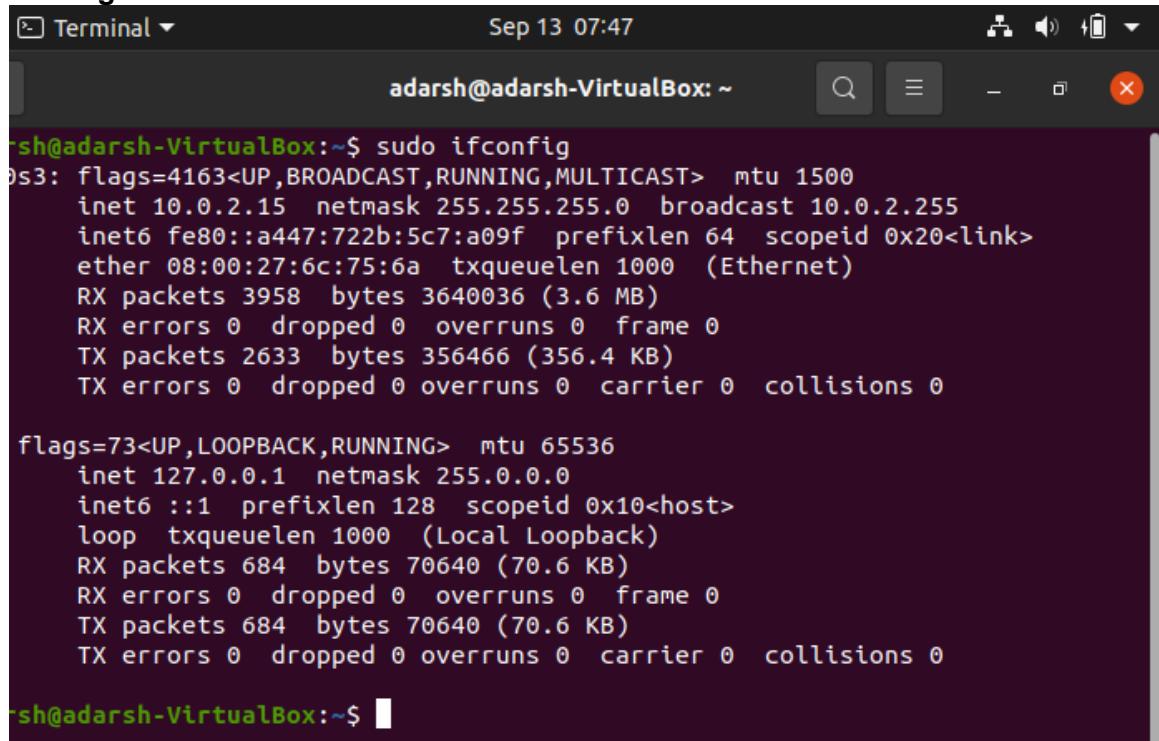
Wireless LAN adapter Local Area Connection* 2:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix . :
  IPv6 Address . . . . . : 240b:4073:4e09:8072:ea8c:cd31:7f17:8b0c
  Link-local IPv6 Address . . . . . : fe80::a80c:cd31:7f17:8b0c%17
  IPv4 Address . . . . . : 192.168.43.228
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : fe80::84a6:bcff:fe2e:3ce7%17
                                         192.168.43.1

Ethernet adapter Bluetooth Network Connection:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

C:\Users\micromedia02>Netstat
Active Connections
  Command Prompt
```

### ifconfig



```
adarsh@adarsh-VirtualBox: ~
Sep 13 07:47
adarsh@adarsh-VirtualBox: ~
rsh@adarsh-VirtualBox:~$ sudo ifconfig
0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
        inet6 fe80::a447:722b:5c7:a09f prefixlen 64 scopeid 0x20<link>
            ether 08:00:27:6c:75:6a txqueuelen 1000 (Ethernet)
                RX packets 3958 bytes 3640036 (3.6 MB)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 2633 bytes 356466 (356.4 KB)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
            loop txqueuelen 1000 (Local Loopback)
                RX packets 684 bytes 70640 (70.6 KB)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 684 bytes 70640 (70.6 KB)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

rsh@adarsh-VirtualBox:~$
```

```
Terminal Sep 13 07:47 adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ ifconfig -a
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
        inet6 fe80::a447:722b:5c7:a09f prefixlen 64 scopeid 0x20<link>
          ether 08:00:27:6c:75:6a txqueuelen 1000 (Ethernet)
            RX packets 3959 bytes 3640126 (3.6 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 2647 bytes 358532 (358.5 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
            RX packets 705 bytes 72426 (72.4 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 705 bytes 72426 (72.4 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

adarsh@adarsh-VirtualBox:~$ █
Terminal Sep 13 07:49 adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ ifconfig -s
Iface      MTU     RX-OK RX-ERR RX-DRP RX-OVR     TX-OK TX-ERR TX-DRP TX-OVR Flg
enp0s3    1500     3960      0      0 0       2652      0      0      0 BMRU
lo        65536     707      0      0 0       707      0      0      0 LRU
adarsh@adarsh-VirtualBox:~$ ifconfig -v
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
        inet6 fe80::a447:722b:5c7:a09f prefixlen 64 scopeid 0x20<link>
          ether 08:00:27:6c:75:6a txqueuelen 1000 (Ethernet)
            RX packets 3960 bytes 3640186 (3.6 MB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 2652 bytes 359272 (359.2 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
            RX packets 707 bytes 72718 (72.7 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 707 bytes 72718 (72.7 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

adarsh@adarsh-VirtualBox:~$ █
```

```
adarsh@adarsh-VirtualBox:~$ ifconfig --help
Usage:
ifconfig [-a] [-v] [-s] <interface> [[<AF>] <address>]
[add <address>/<prefixlen>]
[del <address>/<prefixlen>]
[[[-]broadcast [<address>]] [[[-]pointopoint [<address>]]
[netmask <address>] [dstaddr <address>] [tunnel <address>]
[outfill <NN>] [keepalive <NN>]
[hw <HW> <address>] [mtu <NN>]
[[[-]trailers] [[[-]arp] [[[-]allmulti]
[multicast] [[[-]promisc]
[mem_start <NN>] [io_addr <NN>] [irq <NN>] [media <type>]
[txqueuelen <NN>]
[[[-]dynamic]
[up|down] ...

<HW>=Hardware Type.
List of possible hardware types:
loop (Local Loopback) slip (Serial Line IP) cslip (VJ Serial Line IP)
slip6 (6-bit Serial Line IP) cslip6 (VJ 6-bit Serial Line IP) adaptive (Adaptive Serial Line IP)
ash (Ash) ether (Ethernet) ax25 (AMPR AX.25)
netrom (AMPR NET/ROM) rose (AMPR ROSE) tunnel (IPIP Tunnel)
ppp (Point-to-Point Protocol) hdlc ((Cisco)-HDLC) lapb (LAPB)
arcnet (ARCnet) dlci (Frame Relay DLCI) frad (Frame Relay Access Device)
sit (IPv6-in-IPv4) fddi (Fiber Distributed Data Interface) hippi (HIPPI)
irda (IrLAP) ec (Econet) x25 (generic X.25)
eui64 (Generic EUI-64)
<AF>=Address family. Default: inet
```

## Netstat

```

C:\> Command Prompt
Connection-specific DNS Suffix : 
C:\Users\micromedia02>Netstat
Active Connections

Proto Local Address          Foreign Address        State
TCP   192.168.43.220:49095  137:https              TIME_WAIT
TCP   192.168.43.220:50252  20.197.71.89:https    ESTABLISHED
TCP   192.168.43.220:40660  ec2-52-202-128-45:https TIME_WAIT
TCP   192.168.43.220:51273  13.107.6.254:61-27:https TIME_WAIT
TCP   192.168.43.220:40899  76:https               TIME_WAIT
TCP   192.168.43.220:50259  maa05s21-in-f4:https  TIME_WAIT
TCP   192.168.43.220:50328  40.119.205.193:https  TIME_WAIT
TCP   192.168.43.220:50442  ec2-52-202-128-45:https TIME_WAIT
TCP   192.168.43.220:50598  a97add881b0f02c4:https TIME_WAIT
TCP   192.168.43.220:51178  ec2-52-221-144-69:https TIME_WAIT
TCP   192.168.43.220:51271  90:https               TIME_WAIT
TCP   192.168.43.220:51276  ec2-3-225-64-61-27:https TIME_WAIT
TCP   192.168.43.220:52345  13.107.6.254:61-27:https TIME_WAIT
TCP   192.168.43.220:52777  204.79.197.222:https  ESTABLISHED
TCP   192.168.43.220:52779  20.38.0.3:https       ESTABLISHED
TCP   192.168.43.220:52730  117.18.237.29:https  ESTABLISHED
TCP   192.168.43.220:52731  13.107.6.254:https    ESTABLISHED
TCP   192.168.43.220:52966  ec2-34-235-197-155:https TIME_WAIT
TCP   192.168.43.220:53793  maa05s19-in-f6:https  TIME_WAIT
TCP   192.168.43.220:54843  111:https              TIME_WAIT
TCP   192.168.43.220:55949  ec2-52-45-61-27:https TIME_WAIT
TCP   192.168.43.220:56045  13.107.6.254:61-27:https TIME_WAIT
TCP   192.168.43.220:56839  server-13-225-255-71:https TIME_WAIT
TCP   192.168.43.220:56839  server-13-225-255-71:https TIME_WAIT
TCP   192.168.43.220:57278  51.104.167.255:https  TIME_WAIT
TCP   192.168.43.220:57288  20.198.162.76:https   ESTABLISHED
TCP   192.168.43.220:58785  ec2-3-222-213-29:https TIME_WAIT
TCP   192.168.43.220:58953  maa05s21-in-f4:https  TIME_WAIT
TCP   192.168.43.220:59313  ec2-34-235-197-155:https TIME_WAIT
TCP   192.168.43.220:60040  ec2-52-45-61-27:https TIME_WAIT
TCP   192.168.43.220:60351  maa05s21-in-f4:https  TIME_WAIT
TCP   192.168.43.220:60495  ec2-3-215-64-185:https TIME_WAIT
TCP   192.168.43.220:60495  ec2-3-222-213-29:https TIME_WAIT
TCP   192.168.43.220:60495  ec2-52-45-61-27:https TIME_WAIT
TCP   192.168.43.220:60969  ec2-52-45-61-27:https TIME_WAIT
TCP   192.168.43.220:61126  maa03s43-in-f2:https  TIME_WAIT
TCP   192.168.43.220:61570  ec2-3-215-64-185:https TIME_WAIT
TCP   192.168.43.220:61658  ec2-34-235-197-155:https TIME_WAIT
TCP   192.168.43.220:62024  121:https              TIME_WAIT
TCP   192.168.43.220:62800  ec2-3-222-213-29:https TIME_WAIT
TCP   192.168.43.220:62800  20.46.100.120:43:https ESTABLISHED
TCP   192.168.43.220:62800  ec2-3-222-213-29:https TIME_WAIT
TCP   192.168.43.220:63358  ec2-3-222-213-29:https ESTABLISHED
TCP   192.168.43.220:63654  40.79.197.35:https   ESTABLISHED

C:\Users\micromedia02>netstat -n

Active Connections

Proto Local Address          Foreign Address        State
TCP   192.168.43.220:51178  20.197.71.89:443      ESTABLISHED
TCP   192.168.43.220:62193  20.198.162.78:443      ESTABLISHED
TCP   [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443 ESTABLISHED
TCP   [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443 ESTABLISHED

C:\Users\micromedia02>netstat -n 5

Active Connections

Proto Local Address          Foreign Address        State
TCP   192.168.43.220:51178  20.197.71.89:443      ESTABLISHED
TCP   192.168.43.220:62193  20.198.162.78:443      ESTABLISHED
TCP   [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443 ESTABLISHED
TCP   [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443 ESTABLISHED

Active Connections

Proto Local Address          Foreign Address        State
TCP   192.168.43.220:51178  20.197.71.89:443      ESTABLISHED
TCP   192.168.43.220:62193  20.198.162.78:443      ESTABLISHED
TCP   [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443 ESTABLISHED
TCP   [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698  [2606:2800:147:120f:30c:1ba0:fc6:265a]:443 ESTABLISHED

Active Connections

Proto Local Address          Foreign Address        State
TCP   192.168.43.220:51178  20.197.71.89:443      ESTABLISHED
TCP   192.168.43.220:62193  20.198.162.78:443      ESTABLISHED

```

```
C:\Users\micromedia02>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135           LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:445           LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:5040          LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:49664          LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:49665          LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:49666          LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:49667          LAPTOP-HIR5TON1:0   LISTENING
  TCP    0.0.0.0:49669          LAPTOP-HIR5TON1:0   LISTENING
  TCP    127.0.0.1:5939         LAPTOP-HIR5TON1:0   LISTENING
  TCP    127.0.0.1:27017        LAPTOP-HIR5TON1:0   LISTENING
  TCP    127.0.0.1:37014        LAPTOP-HIR5TON1:0   LISTENING
  TCP    127.0.0.1:37114        LAPTOP-HIR5TON1:0   LISTENING
  TCP    192.168.43.220:139     LAPTOP-HIR5TON1:0   LISTENING
  TCP    192.168.43.220:51178    20.197.71.89:https ESTABLISHED
  TCP    192.168.43.220:62193    20.198.162.78:https ESTABLISHED
  TCP    192.168.56.1:139        LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:135               LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:445               LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:49664              LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:49665              LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:49666              LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:49667              LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:49669              LAPTOP-HIR5TON1:0   LISTENING
  TCP    [::]:49668              LAPTOP-HIR5TON1:0   LISTENING
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59696 [2606:2800:147:120f:30c:1ba0:fc6:265a]:ht
  TCP    [2409:4073:204:4e78:e53d:e792:1e6c:ce5d]:59698 [2606:2800:147:120f:30c:1ba0:fc6:265a]:ht
  UDP    0.0.0.0:3702            *:*
  UDP    0.0.0.0:3702            *:*
  UDP    0.0.0.0:5050            *:*
  UDP    0.0.0.0:5050            *:*

Netstat in linux
```

```
adarsh@adarsh-VirtualBox:~$ sudo netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp        0      0 adarsh-VirtualBo:bootpc _gateway:bootps      ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type      State         I-Node Path
unix  2      [ ]        DGRAM                    32987  /run/user/1000/systemd/notify
unix  3      [ ]        DGRAM                    15498  /run/systemd/notify
unix  2      [ ]        DGRAM                    15512  /run/systemd/journal
' syslog
 unix 19     [ ]        DGRAM                    15522  /run/systemd/journal
' dev-log
 unix  8      [ ]        DGRAM                    15526  /run/systemd/journal
' socket
 unix  3      [ ]        STREAM     CONNECTED    37786  /run/systemd/journal
 unix  3      [ ]        STREAM     CONNECTED    37568  /run/systemd/journal
' stdout
 unix  3      [ ]        STREAM     CONNECTED    23256 
 unix  2      [ ]        DGRAM                    20328 
 unix  3      [ ]        STREAM     CONNECTED    20187  /run/systemd/journal
' stdout
 unix  3      [ ]        STREAM     CONNECTED    27210  /run/systemd/journal
' stdout
 unix  3      [ ]        STREAM     CONNECTED    22920  /run/systemd/journal
' stdout
 unix  3      [ ]        STREAM     CONNECTED    37783 
 unix  3      [ ]        STREAM     CONNECTED    37610  /run/user/1000/bus
 unix  2      [ ]        DGRAM                    23238 
```

```
Terminal Sep 13 07:51 adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 localhost:mysql          0.0.0.0:*
tcp      0      0 localhost:domain        0.0.0.0:*
tcp      0      0 0.0.0.0:ssh            0.0.0.0:*
tcp      0      0 localhost:ipp            0.0.0.0:*
tcp6     0      0 [::]:http              [::]:*                LISTEN
tcp6     0      0 [::]:ssh               [::]:*                LISTEN
tcp6     0      0 ip6-localhost:ipp       [::]:*                LISTEN
udp      0      0 localhost:domain        0.0.0.0:*
udp      0      0 adarsh-VirtualBo:bootpc _gateway:bootps    ESTABLISHED
udp      0      0 0.0.0.0:mdns           0.0.0.0:*
udp      0      0 0.0.0.0:58925          0.0.0.0:*
udp      0      0 0.0.0.0:631           0.0.0.0:*
udp6     0      0 [::]:58407            [::]:*                LISTEN
udp6     0      0 [::]:mdns             [::]:*                LISTEN
raw6     0      0 [::]:ipv6-icmp        [::]:*                7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags     Type      State       I-Node  Path
unix   2      [ ACC ]   STREAM    LISTENING  35646   @/tmp/.ICE-unix/1599
unix   2      [ ]        DGRAM     LISTENING  32987   /run/user/1000/systemd/notify
unix   2      [ ACC ]   STREAM    LISTENING  26260   @/tmp/dbus-NeM4JNy9
unix   2      [ ACC ]   STREAM    LISTENING  32990   /run/user/1000/systemd/private
unix   2      [ ACC ]   STREAM    LISTENING  32999   /run/user/1000/bus
unix   2      [ ACC ]   STREAM    LISTENING  33000   /run/user/1000/gnupg
/s.dirmngr
```

```
Terminal Sep 13 07:52 adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
adarsh@adarsh-VirtualBox:~$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 localhost:mysql          0.0.0.0:*
tcp      0      0 localhost:domain        0.0.0.0:*
tcp      0      0 0.0.0.0:ssh            0.0.0.0:*
tcp      0      0 localhost:ipp            0.0.0.0:*
tcp6     0      0 [::]:http              [::]:*                LISTEN
tcp6     0      0 [::]:ssh               [::]:*                LISTEN
tcp6     0      0 ip6-localhost:ipp       [::]:*                LISTEN
udp      0      0 localhost:domain        0.0.0.0:*
udp      0      0 0.0.0.0:mdns           0.0.0.0:*
udp      0      0 0.0.0.0:58925          0.0.0.0:*
udp      0      0 0.0.0.0:631           0.0.0.0:*
udp6     0      0 [::]:58407            [::]:*                LISTEN
udp6     0      0 [::]:mdns             [::]:*                LISTEN
raw6     0      0 [::]:ipv6-icmp        [::]:*                7
Active UNIX domain sockets (only servers)
Proto RefCnt Flags     Type      State       I-Node  Path
unix   2      [ ACC ]   STREAM    LISTENING  35646   @/tmp/.ICE-unix/1599
unix   2      [ ACC ]   STREAM    LISTENING  26260   @/tmp/dbus-NeM4JNy9
unix   2      [ ACC ]   STREAM    LISTENING  32990   /run/user/1000/systemd/private
unix   2      [ ACC ]   STREAM    LISTENING  32999   /run/user/1000/bus
unix   2      [ ACC ]   STREAM    LISTENING  33000   /run/user/1000/gnupg
/s.dirmngr
```

```
[-] Terminal ▾ Sep 13 07:52
adarsh@adarsh-VirtualBox: ~$ netstat -s
Ip:
    Forwarding: 2
    3734 total packets received
    1 with invalid addresses
    0 forwarded
    0 incoming packets discarded
    3731 incoming packets delivered
    3326 requests sent out
    20 outgoing packets dropped
Icmp:
    40 ICMP messages received
    0 input ICMP message failed
    ICMP input histogram:
        destination unreachable: 40
    41 ICMP messages sent
    0 ICMP messages failed
    ICMP output histogram:
        destination unreachable: 41
IcmpMsg:
    InType3: 40
    OutType3: 41
Icp:
    100 active connection openings
    0 passive connection openings
    4 failed connection attempts
    0 connection resets received
    0 connections established
    1949 segments received
```

### Traceroute

```
address: fe00::ffff::1
>
C:\Users\micromedia02>tracert
Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name
Options:
  -d           Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list  Loose source route along host-list (IPv4-only).
  -w timeout   Wait timeout milliseconds for each reply.
  -R           Trace round-trip path (IPv6-only).
  -S srcaddr   Source address to use (IPv6-only).
  -4           Force using IPv4.
```

```
C:\Users\micromedia02>tracert -R
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
                [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d                  Do not resolve addresses to hostnames.
  -h maximum_hops     Maximum number of hops to search for target.
  -j host-list        Loose source route along host-list (IPv4-only).
  -w timeout          Wait timeout milliseconds for each reply.
  -R                  Trace round-trip path (IPv6-only).
  -S srcaddr          Source address to use (IPv6-only).
  -4                  Force using IPv4.
  -6                  Force using IPv6.

C:\Users\micromedia02>tracert -S
A value must be supplied for option -S.

C:\Users\micromedia02>tracert -D
-D is not a valid command option.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
                [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d                  Do not resolve addresses to hostnames.
  -h maximum_hops     Maximum number of hops to search for target.
  -j host-list        Loose source route along host-list (IPv4-only).
  -w timeout          Wait timeout milliseconds for each reply.
  -R                  Trace round-trip path (IPv6-only).
  -S srcaddr          Source address to use (IPv6-only).
  -4                  Force using IPv4.
  -6                  Force using IPv6.

C:\Users\micromedia02>
```

```
C:\Users\micromedia02>tracert -j
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d                  Do not resolve addresses to hostnames.
  -h maximum_hops    Maximum number of hops to search for target.
  -j host-list        Loose source route along host-list (IPv4-only).
  -w timeout          Wait timeout milliseconds for each reply.
  -R                  Trace round-trip path (IPv6-only).
  -S srcaddr          Source address to use (IPv6-only).
  -4                  Force using IPv4.
  -6                  Force using IPv6.

C:\Users\micromedia02>tracert -w
A value must be supplied for option -w.

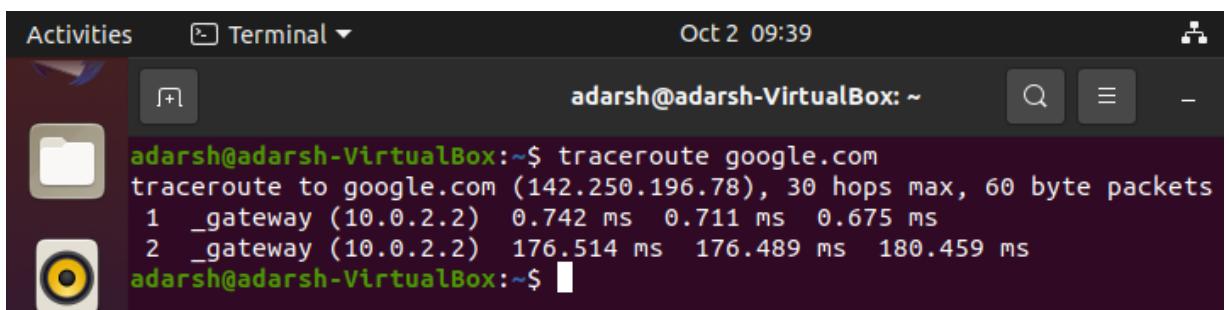
C:\Users\micromedia02>tracert -R
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

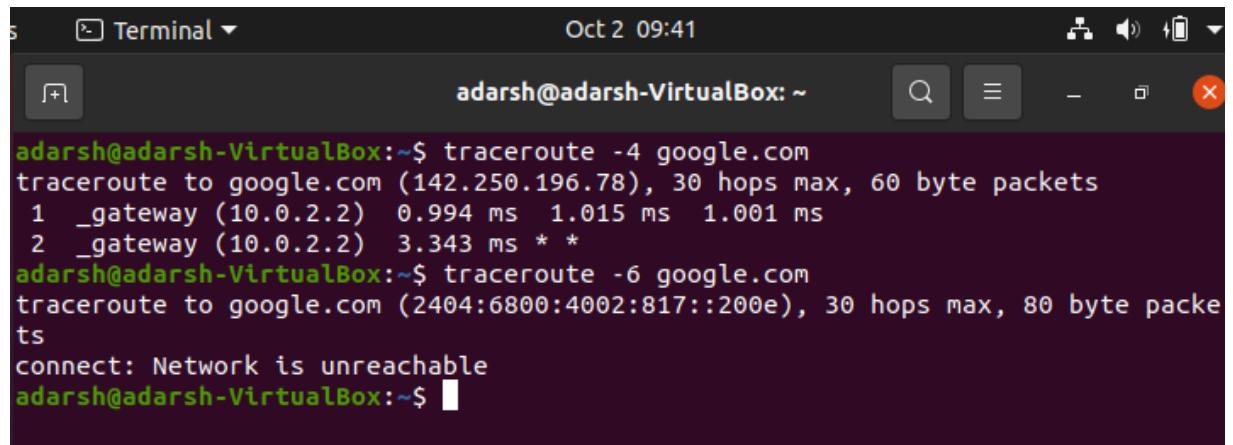
Options:
  -d                  Do not resolve addresses to hostnames.
  -h maximum_hops    Maximum number of hops to search for target.
  -j host-list        Loose source route along host-list (IPv4-only).
  -w timeout          Wait timeout milliseconds for each reply.
  -R                  Trace round-trip path (IPv6-only).
  -S srcaddr          Source address to use (IPv6-only).
  -4                  Force using IPv4.
  -6                  Force using IPv6.

C:\Users\micromedia02>tracert -S
A value must be supplied for option -S.
```

### Traceroute in linux



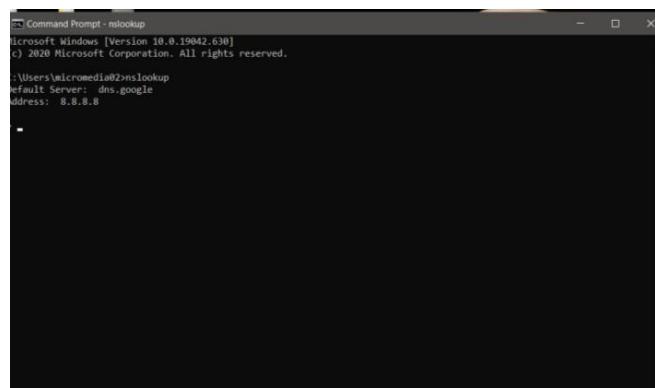
```
Activities Terminal ▾ Oct 2 09:39
adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ traceroute google.com
traceroute to google.com (142.250.196.78), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2)  0.742 ms  0.711 ms  0.675 ms
 2 _gateway (10.0.2.2)  176.514 ms  176.489 ms  180.459 ms
adarsh@adarsh-VirtualBox:~$
```



S Terminal ▾ Oct 2 09:41  
adarsh@adarsh-VirtualBox: ~

```
adarsh@adarsh-VirtualBox:~$ traceroute -4 google.com
traceroute to google.com (142.250.196.78), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2) 0.994 ms  1.015 ms  1.001 ms
 2 _gateway (10.0.2.2) 3.343 ms * *
adarsh@adarsh-VirtualBox:~$ traceroute -6 google.com
traceroute to google.com (2404:6800:4002:817::200e), 30 hops max, 80 byte packets
connect: Network is unreachable
adarsh@adarsh-VirtualBox:~$
```

## Nslookup



Command Prompt - nslookup  
Microsoft Windows [Version 10.0.19042.690]
© 2020 Microsoft Corporation. All rights reserved.  
C:\Users\micromedia\2>nslookup  
Default Server: dns.google  
Address: 8.8.8.8

```
C:\Users\micromedia02>nslookup google.com
Server: dns.google
Address: 8.8.8.8

Non-authoritative answer:
Name: google.com
Addresses: 2404:6800:4007:829::200e
           172.217.163.174
```

### Nslookup in linux

```
Activities Terminal Sep 13 08:02
adarsh@adarsh-VirtualBox: ~
+ adarsh@adarsh-VirtualBox:~$ nslookup google.com
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name: google.com
Address: 142.250.182.174
Name: google.com
Address: 2404:6800:4002:820::200e

adarsh@adarsh-VirtualBox:~$
```

```
Activities Terminal Sep 13 08:02
adarsh@adarsh-VirtualBox: ~
+ adarsh@adarsh-VirtualBox:~$ nslookup google.com
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name: google.com
Address: 142.250.182.174
Name: google.com
Address: 2404:6800:4002:820::200e

adarsh@adarsh-VirtualBox:~$ nslookup -type=ns google.com
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
google.com      nameserver = ns1.google.com.
google.com      nameserver = ns2.google.com.
google.com      nameserver = ns4.google.com.
google.com      nameserver = ns3.google.com.

Authoritative answers can be found from:

adarsh@adarsh-VirtualBox:~$
```

Activities Terminal Sep 13 08:03

```
adarsh@adarsh-VirtualBox:~$ nslookup -type=mx google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
google.com    mail exchanger = 30 alt2.aspmx.l.google.com.
google.com    mail exchanger = 10 aspmx.l.google.com.
google.com    mail exchanger = 20 alt1.aspmx.l.google.com.
google.com    mail exchanger = 50 alt4.aspmx.l.google.com.
google.com    mail exchanger = 40 alt3.aspmx.l.google.com.

Authoritative answers can be found from:

adarsh@adarsh-VirtualBox:~$ nslookup -type=txt google.com
;; Truncated, retrying in TCP mode.
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
google.com    text = "apple-domain-verification=30afIBcvSuDV2PLX"
google.com    text = "MS=E4A68B9AB2BB9670BCE15412F62916164C0B20BB"
google.com    text = "v=spf1 include:_spf.google.com ~all"
google.com    text = "globalsign-smime-dv=CDYX+XFHUw2wml6/Gb8+59BsH31KzUr6c1l
2BPvqKX8="
google.com    text = "google-site-verification=wD8N7i1JTNTkezJ49swvWW48f8_9xv
eREV4oB-0Hf5o"
google.com    text = "facebook-domain-verification=22rm551cu4k0ab0bxsw536tlds
4h95"
google.com    text = "google-site-verification=TV9-DBe4R80X4v0M4U_bd_J9cp0JM0
```

## Route

```
C:\> Command Prompt
>
C:\Users\micromedia02>route
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
      [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f      Clears the routing tables of all gateway entries. If this is
used in conjunction with one of the commands, the tables are
cleared prior to running the command.

-p      When used with the ADD command, makes a route persistent across
boots of the system. By default, routes are not preserved
when the system is restarted. Ignored for all other commands,
which always affect the appropriate persistent routes.

-4      Force using IPv4.

-6      Force using IPv6.

command  One of these:
         PRINT   Prints a route
         ADD    Adds a route
         DELETE Deletes a route
         CHANGE Modifies an existing route

destination Specifies the host.
MASK       Specifies that the next parameter is the 'netmask' value.
netmask    Specifies a subnet mask value for this route entry.
           If not specified, it defaults to 255.255.255.255.

gateway   Specifies gateway.

interface  the interface number for the specified route.

METRIC    specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE, Destination or gateway can be a wildcard,
(wildcard is specified as a star "*"), or the gateway argument may be omitted.

If Dest contains a * on ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.

Diagnostic Notes:
  Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
  Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
  The route addition failed, the specified mask parameter is invalid. (Destination & Mask) != Destination.
```

```
C:\Users\micromedia02>route -n

Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
      [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f      Clears the routing tables of all gateway entries. If this is
used in conjunction with one of the commands, the tables are
cleared prior to running the command.

-p      When used with the ADD command, makes a route persistent across
boots of the system. By default, routes are not preserved
when the system is restarted. Ignored for all other commands,
which always affect the appropriate persistent routes.

-4      Force using IPv4.

-6      Force using IPv6.

command  One of these:
         PRINT   Prints a route
         ADD    Adds a route
         DELETE Deletes a route
         CHANGE Modifies an existing route

destination Specifies the host.
MASK       Specifies that the next parameter is the 'netmask' value.
netmask    Specifies a subnet mask value for this route entry.
           If not specified, it defaults to 255.255.255.255.

gateway   Specifies gateway.

interface  the interface number for the specified route.

METRIC    specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
```

```
C:\Users\micromedia02>route -cn
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
          [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f           Clears the routing tables of all gateway entries. If this is
             used in conjunction with one of the commands, the tables are
             cleared prior to running the command.

-p           When used with the ADD command, makes a route persistent across
             boots of the system. By default, routes are not preserved
             when the system is restarted. Ignored for all other commands,
             which always affect the appropriate persistent routes.

-4           Force using IPv4.

-6           Force using IPv6.

command      One of these:
              PRINT   Prints a route
              ADD     Adds a route
              DELETE Deletes a route
              CHANGE Modifies an existing route

destination   Specifies the host.

MASK         Specifies that the next parameter is the 'netmask' value.

netmask      Specifies a subnet mask value for this route entry.
             If not specified, it defaults to 255.255.255.255.

gateway      Specifies gateway.

interface    the interface number for the specified route.

METRIC       specifies the metric, ie. cost for the destination.
```

All symbolic names used for destination are looked up in the network database file NETWORKS. The symbolic names for gateway are looked up in the host name database file HOSTS.

If the command is PRINT or DELETE. Destination or gateway can be a wildcard, (wildcard is specified as a star '\*'), or the gateway argument may be omitted.

If Dest contains a \* or ?, it is treated as a shell pattern, and only matching destination routes are printed. The '\*' matches any string, and '?' matches any one char. Examples: 157.\*.1, 157.\*, 127.\*, \*224\*.

Pattern match is only allowed in PRINT command.

Diagnostic Notes:

Invalid MASK generates an error, that is when (DEST & MASK) != DEST.

Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1



## Route in linux

```
activities Terminal Sep 13 08:04 adarsh@adarsh-VirtualBox:~ adarsh@adarsh-VirtualBox:~$ sudo route Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface default _gateway 0.0.0.0 UG 100 0 0 enp0s3 10.0.2.0 0.0.0.0 255.255.255.0 U 100 0 0 enp0s3 link-local 0.0.0.0 255.255.0.0 U 1000 0 0 enp0s3 adarsh@adarsh-VirtualBox:~$ route -n Kernel IP routing table Destination Gateway Genmask Flags Metric Ref Use Iface 0.0.0.0 10.0.2.2 0.0.0.0 UG 100 0 0 enp0s3 10.0.2.0 0.0.0.0 255.255.255.0 U 100 0 0 enp0s3 169.254.0.0 0.0.0.0 255.255.0.0 U 1000 0 0 enp0s3 adarsh@adarsh-VirtualBox:~$ route -cn route: invalid option -- 'c' Usage: route [-nVee] [-FC] [<AF>] List kernel routing tables route [-v] [-FC] {add|del|flush} ... Modify routing table for AF. route {-h|--help} [<AF>] Detailed usage syntax for specific d AF. route {-V|--version} Display version/author and exit. -v, --verbose be verbose -n, --numeric don't resolve names -e, --extend display other/more information -F, --fib display Forwarding Information Base (default) -C, --cache display routing cache instead of FIB <AF>=Use -4, -6, '-A <af>' or '--<af>'; default: inet List of possible address families (which support routing):
```

ping

```
> F:\Users\micromedia02>ping

C:\Users\micromedia02>ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
           [-r count] [-s count] [[-j host-list] | [-k host-list]]
           [-w timeout] [-A] [-S srcaddr] [-c compartment] [-p]
           [-d] [-6] target_name

Options:
  -t          Ping the specified host until stopped.
              To see statistics and continue - type Control-Break;
              To stop - type Control-C.
  -a          Resolve addresses to hostnames.
  -n count    Number of echo requests to send.
  -l size     Send buffer size.
  -f          Set the Don't Fragment flag in packet (IPv4-only).
  -i TTL      Time To Live.
  -v TOS      Type Of Service (IPv4-only). This setting has been deprecated
              and has no effect on the type of service field in the IP
              Header.
  -r count    Record route for count hops (IPv4-only).
  -s count    Timestamp for count hops (IPv4-only).
  -j host-list Loose source route along host-list (IPv4-only).
  -k host-list Strict source route along host-list (IPv4-only).
  -w timeout  Timeout in milliseconds to wait for each reply.
  -R          Use the routing header to test reverse route also (IPv6-only).
              Use the IPv4 RFC 5052 for the use of this routing header has been
              deprecated. Some systems may drop echo requests if
              this header is used.
  -S srcaddr  Source address to use.
  -c compartment Routing compartment identifier.
  -p          Ping a Hyper-V Network Virtualization provider address.
  -A          Force using IPv4.
  -6          Force using IPv6.
```

```
C:\Users\micromedia02>ping /t
IP address must be specified.

C:\Users\micromedia02>ping /t 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=166ms TTL=112
Reply from 8.8.8.8: bytes=32 time=153ms TTL=112
Reply from 8.8.8.8: bytes=32 time=171ms TTL=112
Reply from 8.8.8.8: bytes=32 time=64ms TTL=112
Reply from 8.8.8.8: bytes=32 time=54ms TTL=112
Reply from 8.8.8.8: bytes=32 time=50ms TTL=112
Reply from 8.8.8.8: bytes=32 time=62ms TTL=112
Reply from 8.8.8.8: bytes=32 time=80ms TTL=112
Reply from 8.8.8.8: bytes=32 time=48ms TTL=112
Reply from 8.8.8.8: bytes=32 time=41ms TTL=112
Reply from 8.8.8.8: bytes=32 time=59ms TTL=112
Reply from 8.8.8.8: bytes=32 time=45ms TTL=112
Reply from 8.8.8.8: bytes=32 time=68ms TTL=112

Ping statistics for 8.8.8.8:
    Packets: Sent = 13, Received = 13, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 41ms, Maximum = 171ms, Average = 81ms
Control-C
^C
C:\Users\micromedia02>ping /v 8.8.8.8
```

Ping in linux

Activities Terminal Sep 13 08:09 adarsh@adarsh-VirtualBox: ~

```
adarsh@adarsh-VirtualBox:~$ ping www.google.com
PING www.google.com (142.250.193.132) 56(84) bytes of data.
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=1 ttl=111 time=806 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=2 ttl=111 time=125 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=3 ttl=111 time=168 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=4 ttl=111 time=142 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=5 ttl=111 time=84.0 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=6 ttl=111 time=193 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=7 ttl=111 time=158 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=8 ttl=111 time=224 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=9 ttl=111 time=77.4 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=10 ttl=111 time=76.9 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=11 ttl=111 time=161 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=12 ttl=111 time=186 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=13 ttl=111 time=114 ms
64 bytes from maa05s25-in-f4.1e100.net (142.250.193.132): icmp_seq=14 ttl=111 time=111 ms
```

```
PING 0 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.021 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.053 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.070 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.064 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.060 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.101 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.064 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.050 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.061 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.065 ms
```

## 2. Identify and perform 5 more network commands and it's working Getmac

```
C:\Users\micromedia02>getmac
Physical Address      Transport Name
=====
DC-F5-05-F4-B5-11    \Device\Tcpip_{D6C3EBFF-6ED4-4300-82F5-FC83D05A5BE3}
8B-E8-2C-8D-21-99    Media disconnected
DC-F5-05-F4-B5-10    Media disconnected
0A-00-27-00-00-00    \Device\Tcpip_{A42D1934-E311-4A22-8455-4E4C696D5120}

C:\Users\micromedia02>
```

## Hostname

```
C:\Users\micromedia02>getmac  
Physical Address Transport Name  
-----  
DC-F5-05-F4-B5-11 \Device\Tcpip_{D6C3EBFF-6ED4-4300-82F5-FC83D45A5BE3}  
80-E8-2C-BD-21-99 Media disconnected  
DC-F5-05-F4-B5-10 Media disconnected  
0A-00-27-00-00-00 \Device\Tcpip_{A42D1934-E311-4A22-8455-4E4C696D05120}  
  
C:\Users\micromedia02>hostname  
LAPTOP-HIRSTONI  
  
C:\Users\micromedia02>
```

## ARP

```
C:\Users\micromedia02>arp  
Displays and modifies the IP-to-Physical address translation tables used by  
address resolution protocol (ARP).  
  
ARP -s [inet_addr] [eth_addr] [if_addr]  
ARP -d [inet_addr] [if_addr]  
ARP -a [inet_addr] [-N if_addr] [-v]  
  
-s Displays current ARP entries by interrogating the current  
protocol data. If inet_addr is specified, the IP and Physical  
addresses for only the specified computer are displayed. If  
more than one network interface uses ARP, entries for each ARP  
table are displayed.  
-g Same as -a.  
-v Displays current ARP entries in verbose mode. All invalid  
entries and entries on the loop-back interface will be shown.  
inet_addr Specifies an Internet address.  
-h if_addr Displays the ARP entries for the network interface specified  
by if_addr.  
-d Deletes the host specified by inet_addr. inet_addr may be  
wildcarded with * to delete all hosts.  
-s Adds the host and associates the Internet address inet_addr  
with the Physical address eth_addr. The Physical address is  
given as 6 hexadecimal bytes separated by hyphens. The entry  
is permanent.  
eth_addr Specifies a physical address.  
if_addr If present, this specifies the Internet address of the  
interface whose address translation table should be modified.  
If not present, the first applicable interface will be used.  
Example:  
> arp -s 157.55.85.212 00-aa-00-62-c6-09 .... Adds a static entry.  
> arp -a ..... Displays the arp table.  
C:\Users\micromedia02>
```

## Systeminfo

```
C:\ Command Prompt  
C:\Users\micromedia02>systeminfo  
Host Name: LAPTOP-HIRSTONI  
OS Name: Microsoft Windows 10 Home Single Language  
OS Version: 10.0.19042 N/A Build 19042  
OS Manufacturer: Microsoft Corporation  
OS Configuration: Standalone Workstation  
OS Build Type: Multiprocessor Free  
Registered Owner: micromedia02  
Registered Organization: HP  
Product ID: 00327-35142-31596-AA0EM  
Original Install Date: 25-05-2021, 15:54:34  
System Boot Time: 31-08-2021, 16:27:21  
System Manufacturer: HP  
System Model: HP Laptop 15-da0xxx  
System Type: x64-based PC  
Processor(s): 1 Processor(s) Installed.  
[01]: Intel® Family 6 Model 142 Stepping 10 GenuineIntel ~2300 Mhz  
BIOS Version: Insyde F.21, 25-07-2019  
Windows Directory: C:\WINDOWS  
System Directory: C:\WINDOWS\system32  
Boot Device: \Device\HarddiskVolume1  
System Locale: en-us;English (United States)  
Input Locale: 00000409  
Time Zone: (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi  
Total Physical Memory: 4,097 MB  
Available Physical Memory: 714 MB  
Virtual Memory: Max Size: 7,847 MB  
Virtual Memory: Available: 2,546 MB  
Virtual Memory: In Use: 5,301 MB  
Page File Location(s): C:\pagefile.sys  
Domain: WORKGROUP  
Logon Server: \\LAPTOP-HIRSTONI  
Hotfix(s): 6 Hotfix(s) Installed.  
[01]: KB4578068  
[02]: KB4562830  
[03]: KB4570334  
[04]: KB4580325  
[05]: KB4586864  
[06]: KB4586781  
Network Card(s): 4 NIC(s) Installed.  
[01]: Realtek RTL8723DE 802.11b/g/n PCIe Adapter  
Connection Name: Wi-Fi  
DHCP Enabled: Yes  
DHCP Server: 192.168.43.1  
IP address(es)  
[01]: 192.168.43.220  
[02]: fe80::a83c:cd31:7f17:8b0c  
[03]: 2409:4073:de09:8072:5464:c3cb:9f04:e6fb  
[04]: 2409:4073:de09:8072:a83c:d31:7f17:b8bc  
C:\Users\micromedia02>
```

## Pathping

```
C:\Users\micromedia02>pathping  
Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]  
                [-p period] [-q num_queries] [-w timeout]  
                [-4] [-6] target_name  
  
Options:  
-i host-list    Loose source route along host-list.  
-h maximum_hops Maximum number of hops to search for target.  
-i address     Use the specified source address.  
-n             Do not resolve addresses to hostnames.  
-p period      Wait period milliseconds between pings.  
-q num_queries Number of queries per hop.  
-w timeout     Wait timeout milliseconds for each reply.  
-4             Force using IPv4.  
-6             Force using IPv6.  
  
C:\Users\micromedia02>systeminfo  
Host Name:          LAPTOP-HURSTONI  
OS Version:         Microsoft Windows® 10 Home Single Language  
OS Manufacturer:   Microsoft Corporation  
OS Configuration:  Standalone Workstation  
OS Build Type:     Multiprocessor Free
```

## Net

```
D:\>Select Command Prompt  
Connection Name: VirtualBox Host-Only Network  
DHCP Enabled: No  
IP Address(es):  
[01]: 192.168.56.1  
[02]: fe80::916d:5def:c3d6:57b3  
Hyper-V Requirements: VM Monitor Mode Extensions: Yes  
Virtualization Enabled In Firmware: Yes  
Second Level Address Translation: Yes  
Data Execution Prevention Available: Yes  
C:\Users\micromedia02>nbtstat  
'nbtstat' is not recognized as an internal or external command,  
operable program or batch file.  
C:\Users\micromedia02>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\micromedia02>
```

## Nbtstat

```
D:\>Command Prompt  
Type "TASKKILL /?" for usage.  
C:\Users\micromedia02>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)      Prints current contents of the 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\micromedia02>
```

## Linux

### commands ls

### & history

Activities Terminal Sep 13 09:42

```
adarsh@adarsh-VirtualBox:~$ ls
Desktop Downloads latest.tar.gz Public Videos
Documents home Pictures Templates wordpress
adarsh@adarsh-VirtualBox:~$ history
1 man usermod
2 clear
3 man usermod
4 clear
5 man usermod
6 clear
7 sudo usermod -c "This is test user" test_user
8 clear
9 sudo useradd test_user
10 cat /etc/passwd | grep test_user
11 clear
12 sudo usermod -c "This is test user" test_user
13 sudo cat /etc/passwd | grep test_user
14 clear
15 sudo usermod -d /home/manav test_user
16 sudo cat /etc/passwd | grep test_user
17 clear
18 sudo usermod -e 2021-08-10 test_user
19 sudo change -l test_user
20 clear
21 sudo usermod -e 2021-08-10 test_user
22 sudo chage -l test_user
23 clear
24 sudo usermod -g manav test_user
25 clear
```

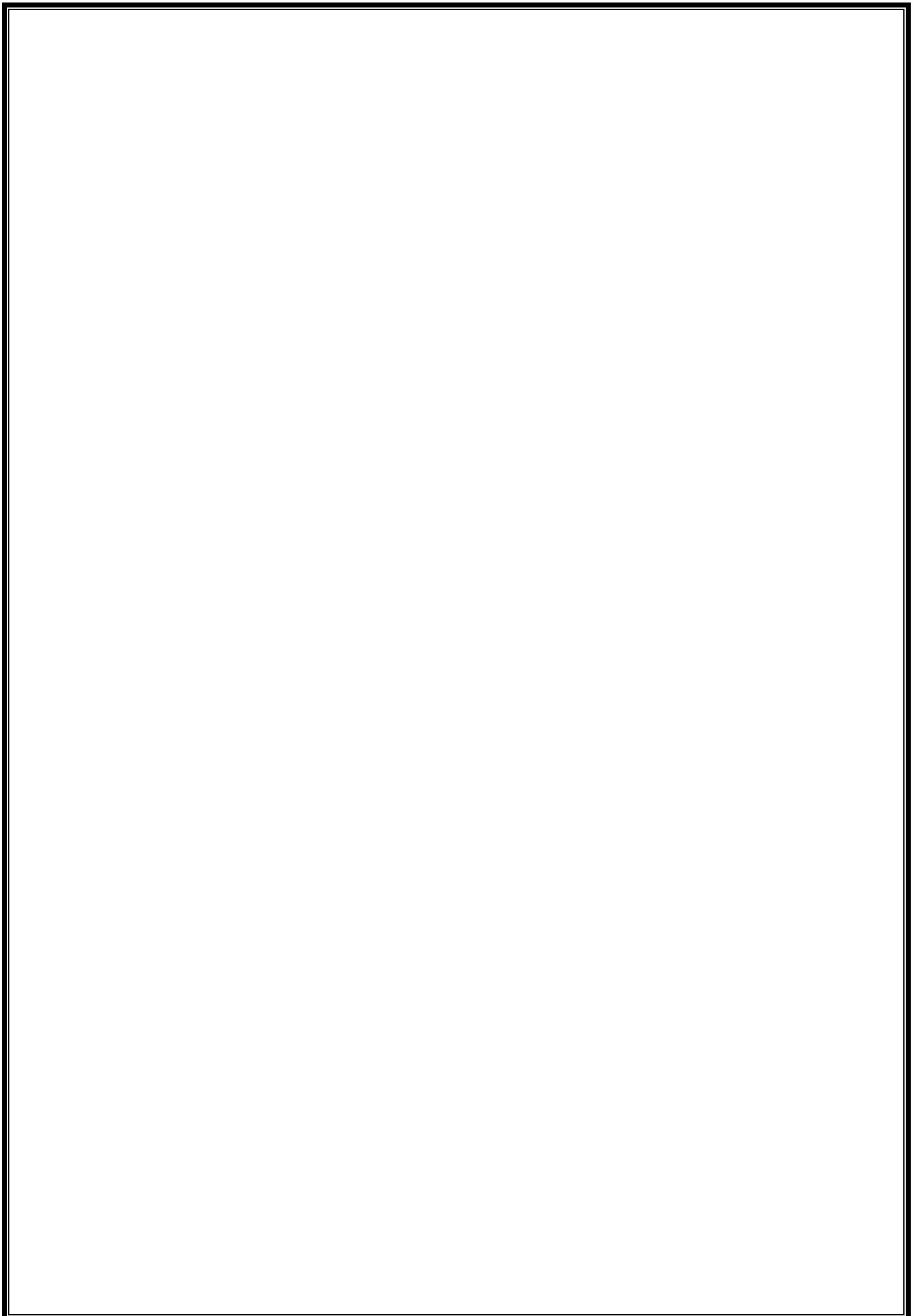
**dig**

```
Activities Terminal Sep 13 09:42 • adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ dig google.com
; <>> DiG 9.16.1-Ubuntu <>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 34627
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;google.com.           IN      A
;; ANSWER SECTION:
google.com.          8       IN      A      142.250.183.238
;; Query time: 3 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Mon Sep 13 09:42:48 IST 2021
;; MSG SIZE rcvd: 55
adarsh@adarsh-VirtualBox:~$
```

**arp**

**host**

```
Activities Terminal Sep 13 09:43 • adarsh@adarsh-VirtualBox: ~
adarsh@adarsh-VirtualBox:~$ arp -e
Address          HWtype  HWaddress          Flags Mask Iface
e_gw_gateway     ether    52:54:00:12:35:02  C        enp0
s3
adarsh@adarsh-VirtualBox:~$ host google.com
google.com has address 142.250.182.174
google.com has IPv6 address 2404:6800:4002:825::200e
google.com mail is handled by 30 alt2.aspmx.l.google.com.
google.com mail is handled by 10 aspmx.l.google.com.
google.com mail is handled by 50 alt4.aspmx.l.google.com.
google.com mail is handled by 40 alt3.aspmx.l.google.com.
google.com mail is handled by 20 alt1.aspmx.l.google.com.
adarsh@adarsh-VirtualBox:~$
```



# **NETWORKING AND SYSTEM ADMINISTRATION LAB**

**SUBMITTED BY,**

**ADARSH S**

**MCA – A**

**ROLL NO : 03**

# INSTALLATION OF LAMP ON UBUNTU

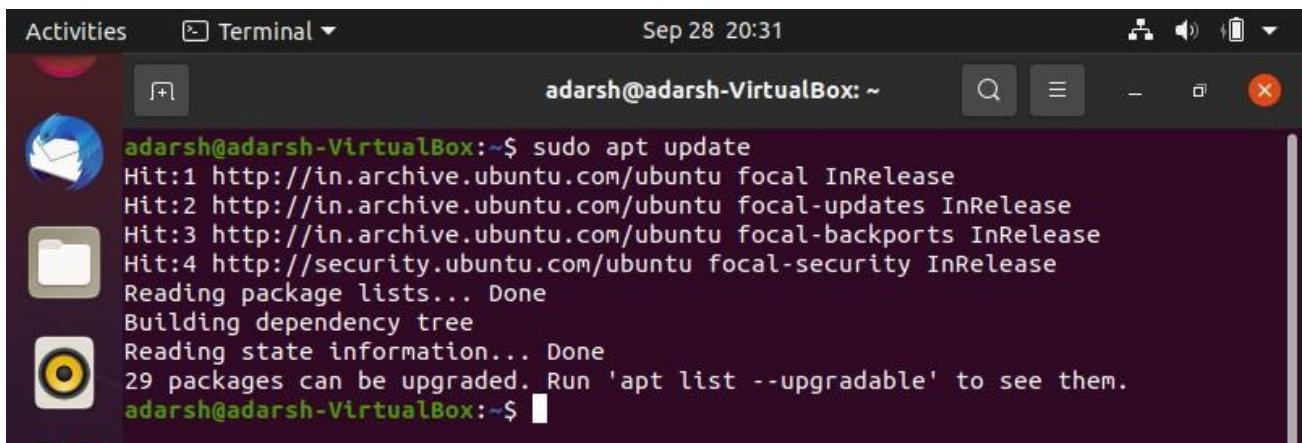
## Introduction

A “LAMP” stack is a group of open-source software that is typically installed together to enable a server to host dynamic websites and web apps. This term is actually an acronym which represents the Linux operating system, with the Apache web server. The site data is stored in a MySQL database, and dynamic content is processed by PHP

### Step 1 — Installing Apache and Updating the Firewall

First, make sure your apt cache is updated with:

```
$ sudo apt update
```

A screenshot of a terminal window titled "Terminal". The window shows the command "sudo apt update" being run and its output. The output includes several "Hit" messages for different Ubuntu repositories, followed by "Reading package lists... Done", "Building dependency tree", "Reading state information... Done", and a message indicating 29 packages can be upgraded. The terminal window has a dark background with light-colored text and icons.

Once the cache has been updated, you can install Apache with:

```
$ sudo apt install apache2
```

After installation We need to check the status:

```
$ service apache2 status
```

Activities Terminal ▾ Sep 28 20:35 adarsh@adarsh-VirtualBox: ~

```
adarsh@adarsh-VirtualBox:~$ service apache2 status
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres>
   Active: active (running) since Tue 2021-09-28 20:25:34 IST; 9min ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 735 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SU>
 Main PID: 889 (apache2)
   Tasks: 6 (limit: 3518)
  Memory: 19.0M
    CGroup: /system.slice/apache2.service
            └─889 /usr/sbin/apache2 -k start
              ├─899 /usr/sbin/apache2 -k start
              ├─900 /usr/sbin/apache2 -k start
              ├─901 /usr/sbin/apache2 -k start
              ├─904 /usr/sbin/apache2 -k start
              └─905 /usr/sbin/apache2 -k start

Sep 28 20:25:27 adarsh-VirtualBox systemd[1]: Starting The Apache HTTP Server.>
Sep 28 20:25:34 adarsh-VirtualBox apachectl[780]: AH00558: apache2: Could not >
Sep 28 20:25:34 adarsh-VirtualBox systemd[1]: Started The Apache HTTP Server.
lines 1-19/19 (END)
```



Activities Firefox Web Browser Sep 28 20:58

Apache2 Ubuntu Default Pack X

localhost

```
/etc/apache2/
|-- apache2.conf
|   '-- ports.conf
|-- mods-enabled
|   '-- *.load
|   '-- *.conf
|-- conf-enabled
|   '-- *.conf
|-- sites-enabled
|   '-- *.conf
```

- apache2.conf is the main configuration file. It puts the pieces together by including all relevant configuration files when starting up the web server.
- ports.conf is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
- Configuration files in the mods-enabled/, conf-enabled/ and sites-enabled/ directories contain particular configuration snippets which manage modules, global configuration fragments, virtual host configurations, respectively.
- They are activated by symlinking available configuration files from their respective \*-available counterparts. These should be managed by using our helpers a2enmod, a2dismod, a2ensite, a2dissite, and a2enconf, a2disconf . See their respective man pages for detailed information.
- The binary is called apache2. Due to the use of environment variables, in the default configuration, apache2 needs to be started/stopped with /etc/init.d/apache2 or apache2ctl . **Calling /usr/bin/apache2 directly will not work** with the default configuration.

### Document Roots

By default, Ubuntu does not allow access through the web browser to *any* file apart of those located in /var/www, **public\_html** directories (when enabled) and /usr/share (for web applications). If you are using a web document root located elsewhere (such as in /srv) you may need to whitelist your document root directory in /etc/apache2/apache2.conf.

The default Ubuntu document root is /var/www/html. You can make your own virtual hosts under /var/www. This is different to previous releases which provides better security out of the box.

### Reporting Problems

Please use the ubuntu-bug tool to report bugs in the Apache2 package with Ubuntu. However, please check **existing bug reports** before reporting a new bug.

Please report bugs specific to modules (such as PHP and others) to respective packages, not to the server itself.

## Step 2 — Installing MySQL

Now that you have your web server up and running, it is time to install MySQL.

MySQL is a database management system. Basically,

it will organize and provide access to databases where your site can store information.

Again, use apt to acquire and install this software:

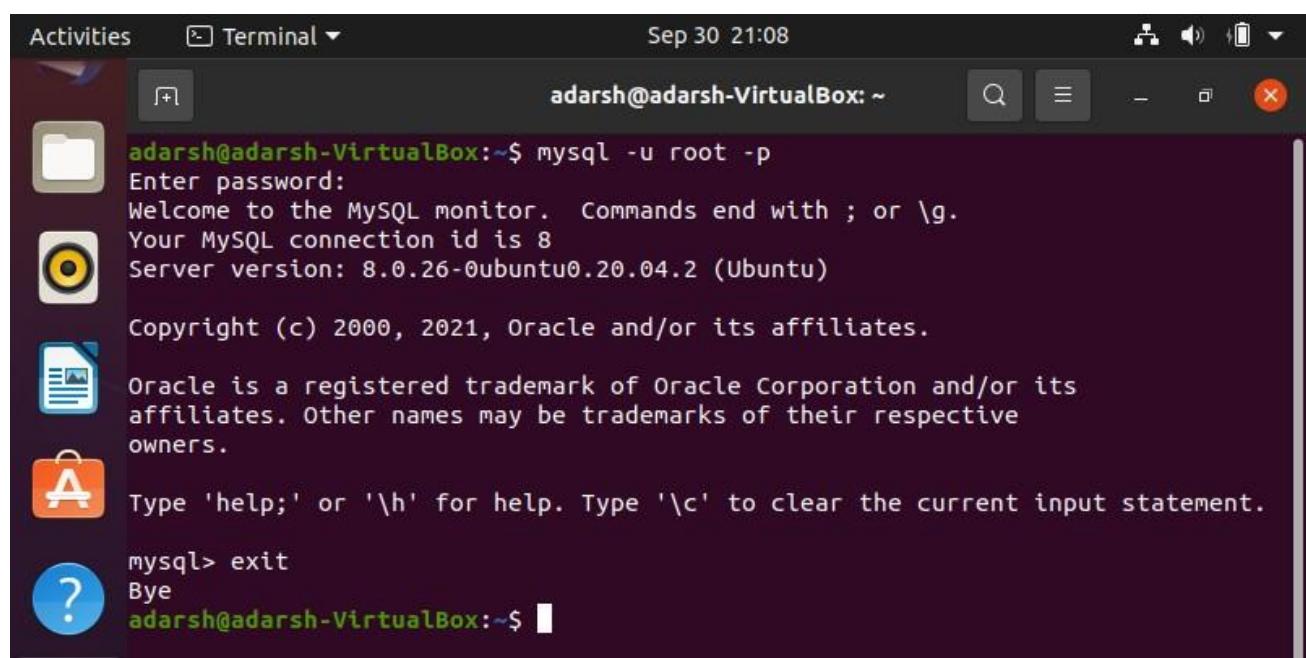
```
$ sudo apt install mysql-server
```

When you're finished, test if you're able to log in to the MySQL console by typing:

```
$ mysql -u root -p
```

To exit the MySQL console, type:

```
$ exit
```



The screenshot shows a terminal window titled "Terminal" with the command "adarsh@adarsh-VirtualBox:~\$". The user runs the command "mysql -u root -p", enters the root password, and is greeted by the MySQL monitor. The monitor displays the connection id (8), server version (8.0.26-0ubuntu0.20.04.2), and copyright information from Oracle. It also mentions that Oracle is a registered trademark of Oracle Corporation and/or its affiliates. The user then types "exit" and "Bye" to exit the MySQL monitor, returning to the terminal prompt.

```
adarsh@adarsh-VirtualBox:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.26-0ubuntu0.20.04.2 (Ubuntu)

Copyright (c) 2000, 2021, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> exit
Bye
adarsh@adarsh-VirtualBox:~$
```

### Step 3 — Installing PHP

Once again, leverage the apt system to install PHP.

In addition to the php package, you'll also need libapache2-mod-php to integrate PHP into Apache,

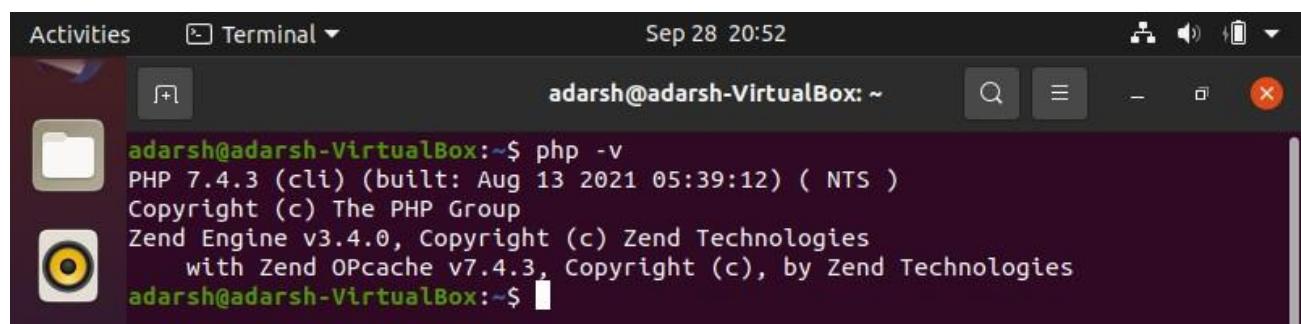
and the php-mysql package to allow PHP to connect to MySQL databases.

Run the following command to install all three packages and their dependencies:

```
$ sudo apt install php libapache2-mod-php php-mysql
```

After installation need to check the version :

```
$ php -v
```



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal". The terminal content shows the command "php -v" being run and its output. The output indicates PHP 7.4.3 (cli) was built on August 13, 2021, at 05:39:12, and it includes Zend Engine v3.4.0 and Zend OPcache v7.4.3. The terminal window is part of a desktop interface with icons for a file folder and a terminal.

```
adarsh@adarsh-VirtualBox:~$ php -v
PHP 7.4.3 (cli) (built: Aug 13 2021 05:39:12) ( NTS )
Copyright (c) The PHP Group
Zend Engine v3.4.0, Copyright (c) Zend Technologies
    with Zend OPcache v7.4.3, Copyright (c), by Zend Technologies
adarsh@adarsh-VirtualBox:~$
```

## Testing PHP Processing on your Web Server

### Localhost/info.php

The screenshot shows a Firefox browser window with the title "PHP 7.4.3 - phpinfo()". The address bar indicates the URL is "localhost/info.php". The main content of the page is titled "PHP Version 7.4.3". Below this, there are two tables of configuration information.

<b>System</b>	
<b>Build Date</b>	Aug 13 2021 05:39:12
<b>Server API</b>	Apache 2.0 Handler
<b>Virtual Directory Support</b>	disabled
<b>Configuration File (php.ini) Path</b>	/etc/php/7.4/apache2
<b>Loaded Configuration File</b>	/etc/php/7.4/apache2/php.ini
<b>Scan this dir for additional .ini files</b>	/etc/php/7.4/apache2/conf.d
<b>Additional .ini files parsed</b>	/etc/php/7.4/apache2/conf.d/10-mysqlnd.ini, /etc/php/7.4/apache2/conf.d/10-pdo.ini, /etc/php/7.4/apache2/conf.d/15-x20-bcmath.ini, /etc/php/7.4/apache2/conf.d/20-bz2.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-dom.ini, /etc/php/7.4/apache2/conf.d/20-ffi.ini, /etc/php/7.4/apache2/conf.d/20-finfo.ini, /etc/php/7.4/apache2/conf.d/20-gd.ini, /etc/php/7.4/apache2/conf.d/20-geconf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-json.ini, /etc/php/7.4/apache2/conf.d/20-mbstring.ini, /etc/php/7.4/apache2/conf.d/20-mysqli.ini, /etc/php/7.4/apache2/conf.d/20-phar.ini, /etc/php/7.4/apache2/conf.d/20-readline.ini, /etc/php/7.4/apache2/conf.d/20-simplexml.ini, /etc/php/7.4/apache2/conf.d/20-zip.ini

<b>PHP API</b>	
<b>PHP Extension</b>	20190902
<b>Zend Extension</b>	320190902
<b>Zend Extension Build</b>	API320190902,NTS
<b>PHP Extension Build</b>	API20190902,NTS
<b>Debug Build</b>	no
<b>Thread Safety</b>	disabled
<b>Zend Signal Handling</b>	enabled
<b>Zend Memory Manager</b>	enabled
<b>Zend Multibyte Support</b>	provided by mbstring
<b>IPv6 Support</b>	enabled
<b>DTrace Support</b>	available, disabled
<b>Registered PHP Streams</b>	https, ftps, compress.zlib, php, file, glob, data, http, ftp, compress

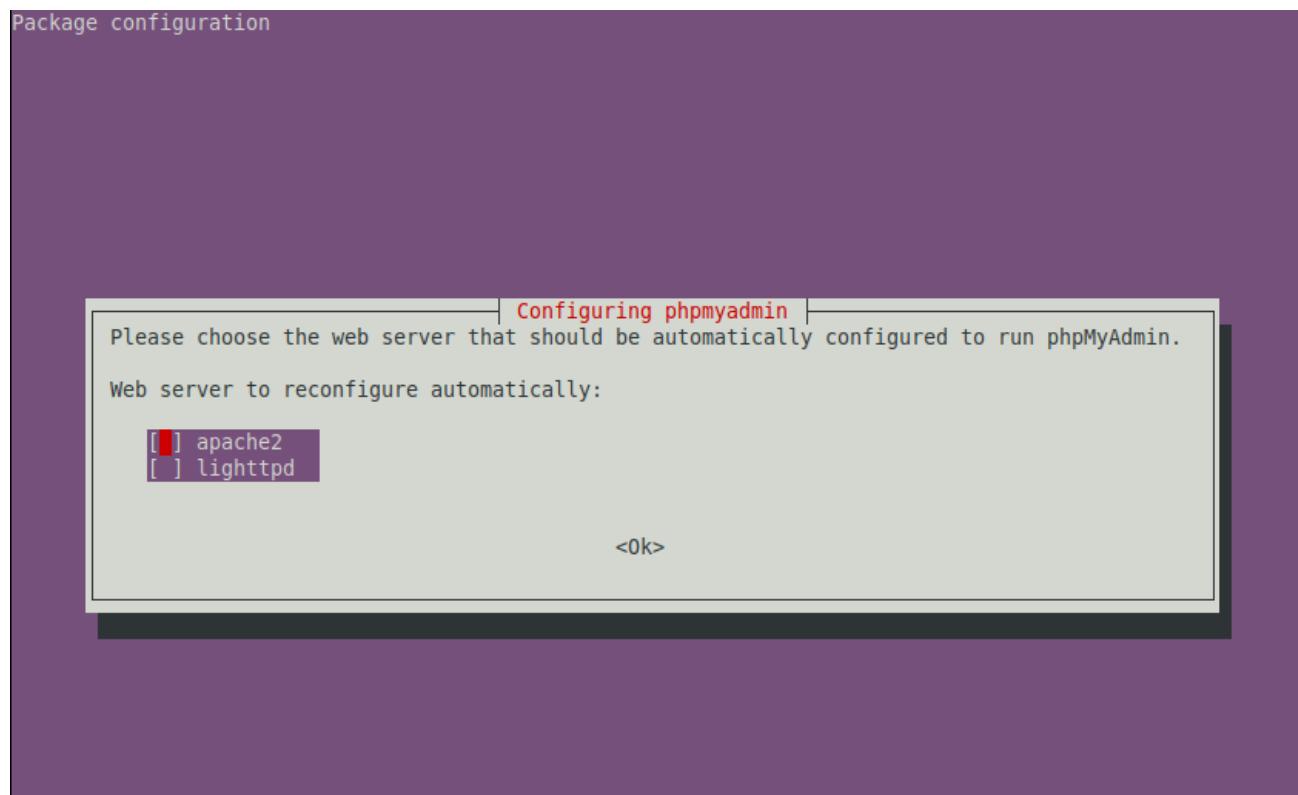
## Step 4 — Installing phpMyadmin

Intended to handle the administration of **MySQL/MariaDB** databases, **PhpMyAdmin** is a free widely-used web-based graphical tool with an intuitive web interface, that supports a wide range of operations on **MySQL** and **MariaDB**.

To install **PhpMyAdmin**, run the following command:

```
$ sudo apt install phpmyadmin
```

During the package installation, you will be prompted to choose the web server that should be automatically configured to run **PhpMyAdmin**. Click enter to use Apache, the default option.



Also, **PhpMyAdmin** must have a database installed and configured before you can start using it. To configure a database for **PhpMyAdmin** with the **dbconfig-common** package, select **yes** in the next prompt.

Package configuration

Configuring phpmyadmin

The phpmyadmin package must have a database installed and configured before it can be used. This can be optionally handled with dbconfig-common.

If you are an advanced database administrator and know that you want to perform this configuration manually, or if your database has already been installed and configured, you should refuse this option. Details on what needs to be done should most likely be provided in /usr/share/doc/phpmyadmin.

Otherwise, you should probably choose this option.

Configure database for phpmyadmin with dbconfig-common?

<Yes>

<No>

Next, create a password for **PhpMyAdmin** to register with the **MariaDB** database server.

Package configuration

Configuring phpmyadmin

Please provide a password for phpmyadmin to register with the database server. If left blank, a random password will be generated.

MySQL application password for phpmyadmin:

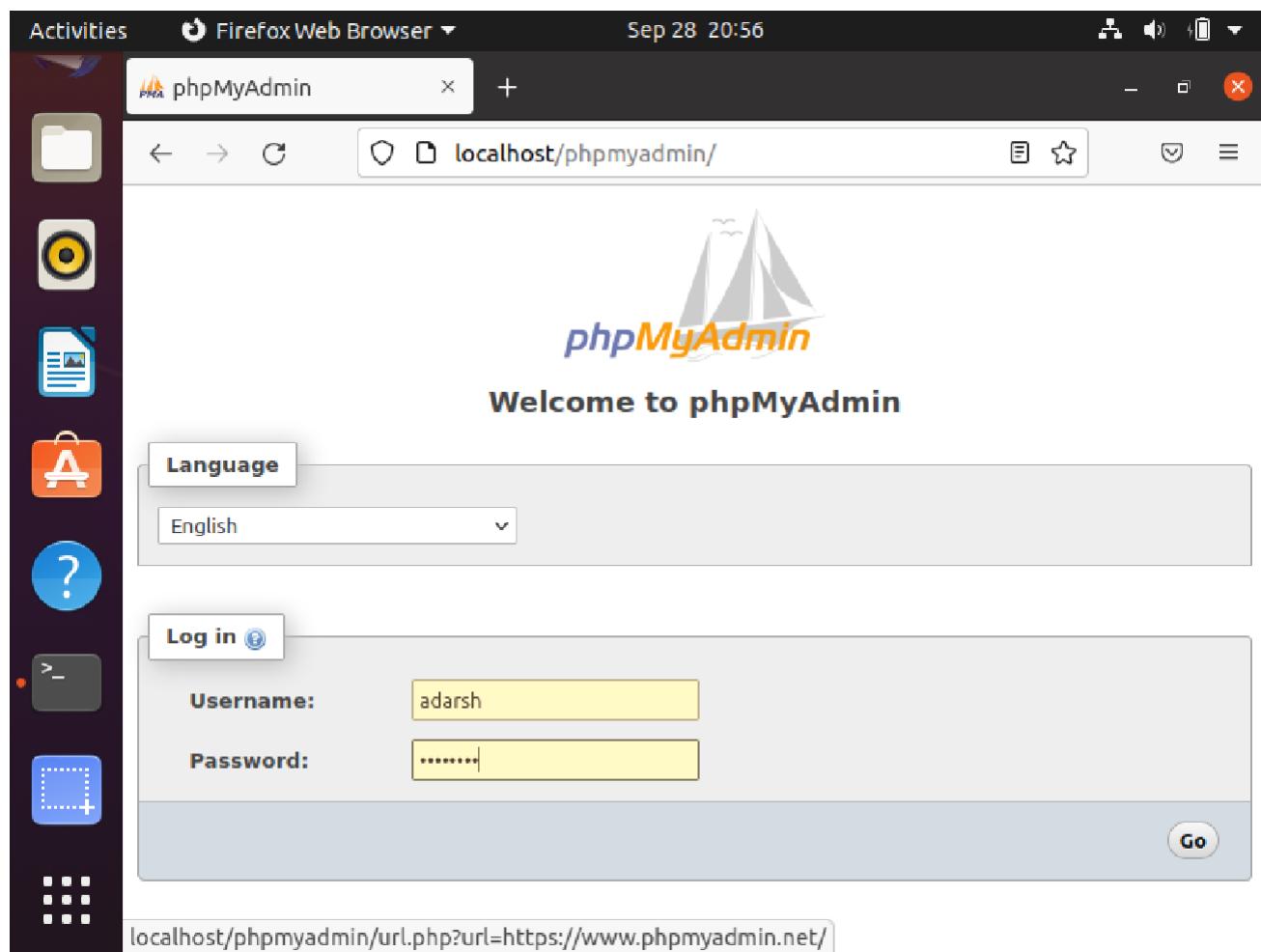
\*\*\*\*\*

<Ok>

<Cancel>

Once the installation process is complete, the configuration files for phpMyAdmin are located in `/etc/phpmyadmin` and its main configuration file is `/etc/phpmyadmin/config.inc.php`. Another important configuration file is `/etc/phpmyadmin/apache.conf`, used to configure Apache2 to work with **PhpMyAdmin**.

Once the **PhpMyAdmin** login page loads, enter **root** for the username and its password, or another MariaDB user, if you have any setup, and enter the user's password. If you disabled remote root user login, you can use the **phpmyadmin** user and password to log in.



After login, you will see the **PhpMyAdmin** dashboard. Use it for managing databases, tables, columns, relations, indexes, users, permissions, etc.

The image shows a Linux desktop environment with a dark theme. A vertical dock on the left contains icons for various applications, including a file manager, terminal, and system settings. Two Firefox browser windows are open, both displaying the phpMyAdmin interface.

**Top Firefox Window:**

- Title bar: Activities → Firefox Web Browser Sep 28 20:57
- Address bar: localhost / localhost | phpMyAdmin +
- Content: General settings and Appearance settings panels. In the General settings panel, "Server connection collation" is set to "utf8mb4\_unicode\_ci".

**Bottom Firefox Window:**

- Title bar: Activities → Firefox Web Browser Sep 28 20:57
- Address bar: localhost / localhost | phpMyAdmin +
- Content: The main phpMyAdmin dashboard showing the "phpMyAdmin" logo and a sidebar with database links: New, information\_schema, mysql, networklab, nsg, performance\_schema, phpmyadmin, and sys.

# **NETWORKING AND SYSTEM ADMINISTRATION LAB**

**SUBMITTED BY,**

**ADARSH S**

**MCA – A**

**ROLL NO : 03**

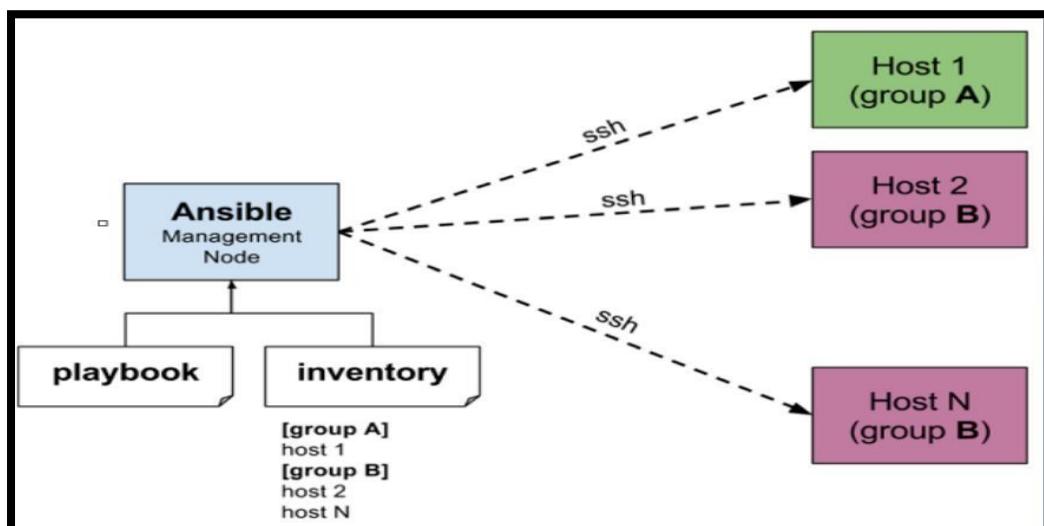
# Ansible

- Ansible is a simple open source IT engine which automates application deployment, intra service orchestration, cloud provisioning and many other IT tools.
- Ansible is easy to deploy because it does not use any agents or custom security infrastructure.
- Ansible uses playbook to describe automation jobs, and playbook uses very simple language i.e. YAML (It's a human-readable data serialization language & is commonly used for configuration files, but could be used in many applications where data is being stored)which is very easy for humans to understand, read and write. Hence the advantage is that even the IT infrastructure support guys can read and understand the playbook and debug if needed (YAML – It is in human readable form).
- Ansible is designed for multi-tier deployment. Ansible does not manage one system at a time, it models IT infrastructure by describing all of your systems as interrelated. Ansible is completely agentless which means Ansible works by connecting your nodes through ssh(by default). But if you want another method for connection like Kerberos, Ansible gives that option to you.

After connecting to your nodes, Ansible pushes small programs called "Ansible Modules". Ansible runs that module on your nodes and removes them when finished. Ansible manages your inventory in simple text files (These are the hosts file). Ansible uses the hosts file where one can group the hosts and can control the actions on a specific group in the playbooks.

## How do Ansible playbooks work?

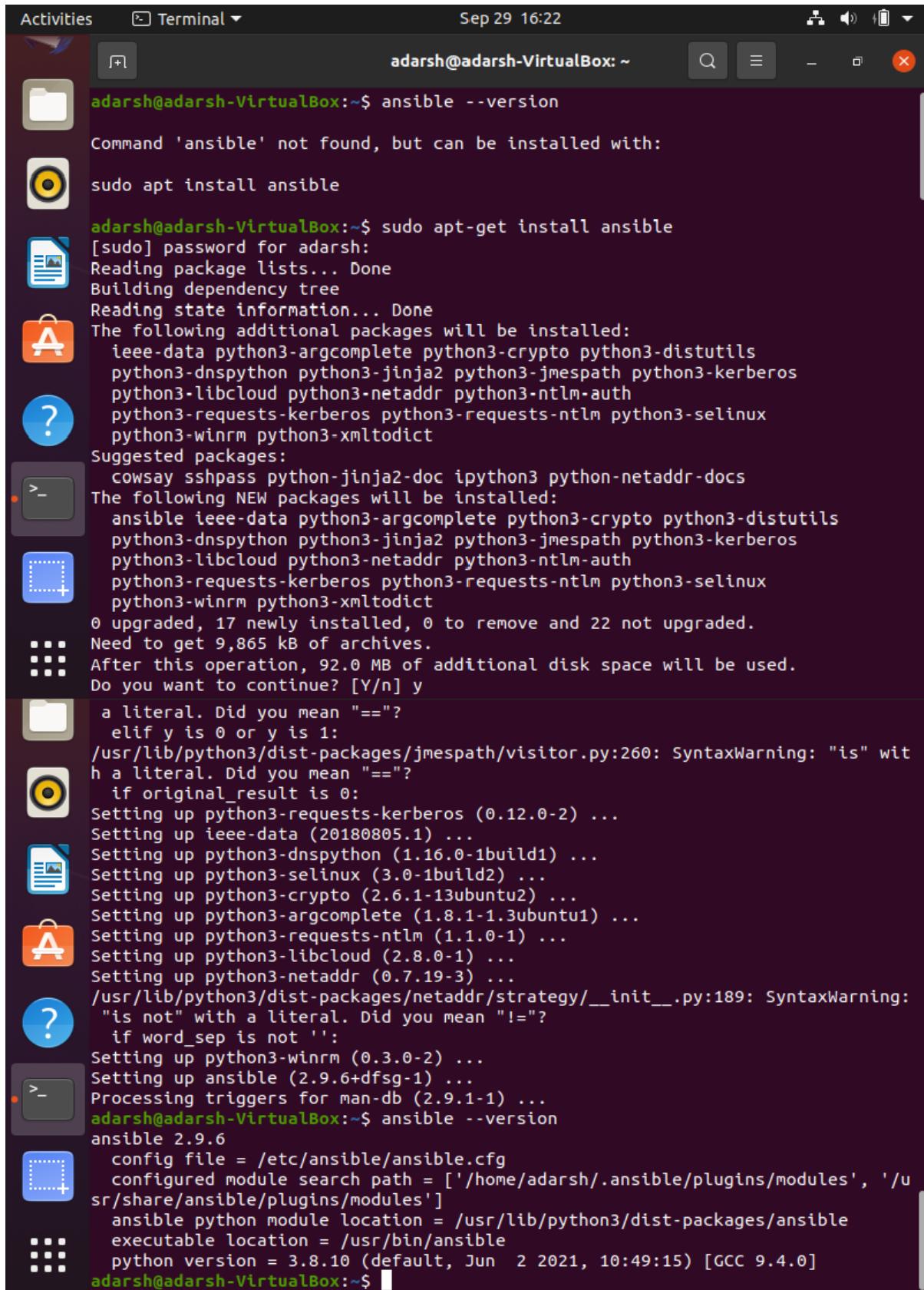
- Ansible works by connecting to your nodes and pushing out small programs, called "Ansible modules" to them. Ansible then executes these modules (over SSH by default), and removes them when finished. Your library of modules can reside on any machine, and there are no servers, daemons, or databases required.



## **Installation Process:**

```
$ sudo apt-get install ansible
```

```
$ ansible --version
```



The screenshot shows a Linux desktop environment with a terminal window open. The terminal window title is "Terminal" and the date and time are "Sep 29 16:22". The user is "adarsh@adarsh-VirtualBox". The terminal output is as follows:

```
adarsh@adarsh-VirtualBox:~$ ansible --version
Command 'ansible' not found, but can be installed with:
sudo apt install ansible
adarsh@adarsh-VirtualBox:~$ sudo apt-get install ansible
[sudo] password for adarsh:
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-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
0 upgraded, 17 newly installed, 0 to remove and 22 not upgraded.
Need to get 9,865 kB of archives.
After this operation, 92.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
a literal. Did you mean "=="?
  elif y is 0 or y is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:260: SyntaxWarning: "is" with a literal. Did you mean "=="?
    if original_result is 0:
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ieee-data (20180805.1) ...
Setting up python3-dnspython (1.16.0-1build1) ...
Setting up python3-selinux (3.0-1build2) ...
Setting up python3-crypto (2.6.1-13ubuntu2) ...
Setting up python3-argcomplete (1.8.1-1.3ubuntu1) ...
Setting up python3-requests-ntlm (1.1.0-1) ...
Setting up python3-libcloud (2.8.0-1) ...
Setting up python3-netaddr (0.7.19-3) ...
/usr/lib/python3/dist-packages/netaddr/strategy/__init__.py:189: SyntaxWarning:
  "is not" with a literal. Did you mean "!="?
    if word_sep is not '':
Setting up python3-winrm (0.3.0-2) ...
Setting up ansible (2.9.6+dfsg-1) ...
Processing triggers for man-db (2.9.1-1) ...
adarsh@adarsh-VirtualBox:~$ ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/adarsh/.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 = 3.8.10 (default, Jun 2 2021, 10:49:15) [GCC 9.4.0]
adarsh@adarsh-VirtualBox:~$
```

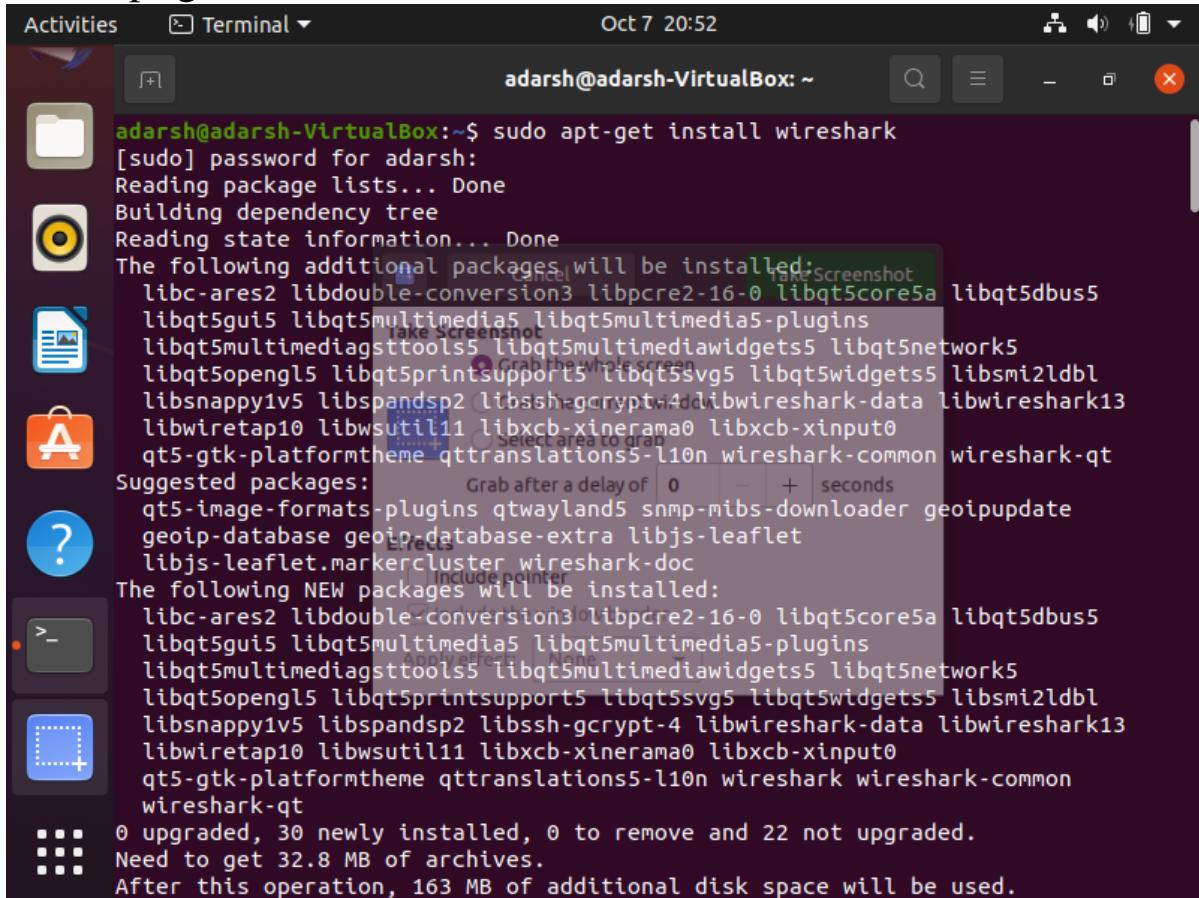
# **Networking & System Administration Lab**

## **Assignment**

Submitted by ,  
Adarsh s  
RollNo : 03  
MCA – A

1. Analyze network packet stream using wireshark. Perform basic network service tests using nc.

sudo apt-get install wireshark



```
adarsh@adarsh-VirtualBox:~$ sudo apt-get install wireshark
[sudo] password for adarsh:
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
  libqt5multimediasupport5 libqt5multimediawidgets5 libqt5network5
  libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l
  libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13
  libwiretap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0
  qt5-gtk-platformtheme qttranslations5-l10n wireshark-common wireshark-qt
Suggested packages:
  qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geoipupdate
  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
  libqt5multimediasupport5 libqt5multimediawidgets5 libqt5network5
  libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l
  libsnappy1v5 libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13
  libwiretap10 libwsutil11 libxcb-xinerama0 libxcb-xinput0
  qt5-gtk-platformtheme qttranslations5-l10n wireshark-common wireshark-qt
0 upgraded, 30 newly installed, 0 to remove and 22 not upgraded.
Need to get 32.8 MB of archives.
After this operation, 163 MB of additional disk space will be used.
```

Activities Terminal ▾ Oct 7 20:52 adarsh@adarsh-VirtualBox: ~

```
Get:8 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5gui5 amd64 5.12.8+dfsg-0ubuntu1 [2,971 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5widgets5 amd64 5.12.8+dfsg-0ubuntu1 [2,293 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5svg5 amd64 5.12.8-0ubuntu1 [131 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5multimediawidgets5 amd64 5.12.8-0ubuntu1 [283 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5opengl5 amd64 5.12.8+dfsg-0ubuntu1 [136 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5multimediamultimedia5 amd64 5.12.8-0ubuntu1 [36.8 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5multimediamsgstools5 amd64 5.12.8-0ubuntu1 [104 kB]
Get:15 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5multimediamultimediasupport5 amd64 5.12.8-0ubuntu1 [197 kB]
Get:16 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5printsupport5 amd64 5.12.8+dfsg-0ubuntu1 [193 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libsmi2ldbl amd64 0.4.8+dfsg2-16 [100 kB]
Get:18 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libspandsp2 amd64 0.0.6+dfsg-2 [272 kB]
Get:19 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libssh-gcrypt-4 amd64 0.9.3-2ubuntu2.2 [202 kB]
Get:20 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libwireshark-data all 3.2.3-1 [1,456 kB]
Get:21 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 libc-ares2 amd64 1.15.0-1ubuntu0.1 [38.2 kB]
Get:22 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libsnappy1v5 amd64
```

## Sudo dpkg-reconfigure wireshark-common

Activities Terminal ▾ Oct 7 20:53 adarsh@adarsh-VirtualBox: ~

```
adarsh@adarsh-VirtualBox:~$ sudo dpkg-reconfigure wireshark-common
[sudo] password for adarsh:
adarsh@adarsh-VirtualBox:~$
```

S Wireshark ▼ Oct 7 20:54 The Wireshark Network Analyzer

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

Welcome to Wireshark

Capture

...using this filter:  All interfaces shown ▾

- ① Cisco remote capture: ciscodump
- ② DisplayPort AUX channel monitor capture: dpauxmon
- ③ Random packet generator: randpkt
- ④ systemd Journal Export: sdjournal
- ⑤ SSH remote capture: sshdump
- ⑥ UDP Listener remote capture: udpdump

Learn

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You are running Wireshark 3.2.3 (Git v3.2.3 packaged as 3.2.3-1).

Ready to load or capture No Packets Profile: Default

Capturing from enp0s3, any, and Loopback: lo

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display Filter ... <Ctrl-/>

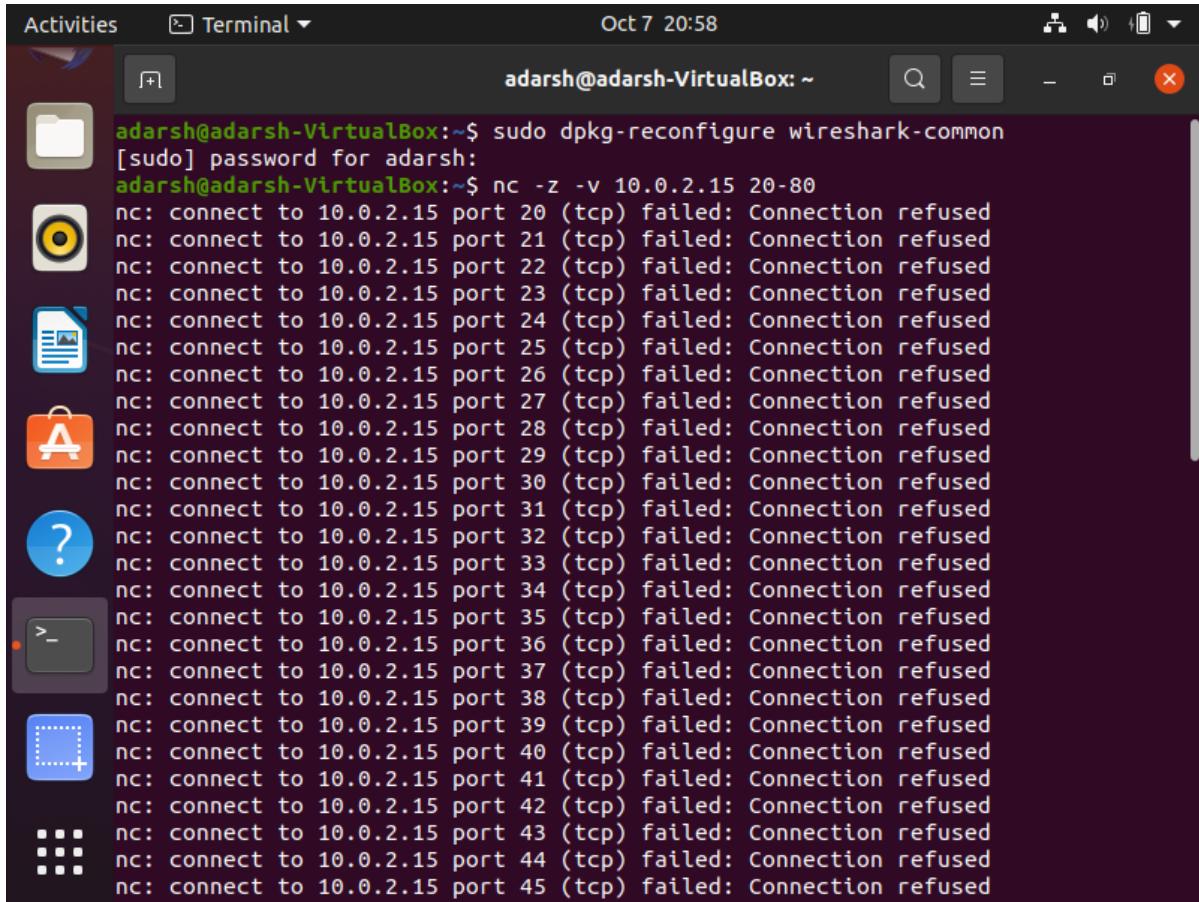
No.	Time	Source	Destination	Protocol	Length
700	3.904189589	13.33.146.49	10.0.2.15	TCP	1402
701	3.904221965	10.0.2.15	13.33.146.49	TCP	54
702	3.907874982	13.33.146.49	10.0.2.15	TCP	1326
703	3.907705214	10.0.2.15	13.33.146.49	TCP	54
704	3.941174357	10.0.2.15	13.33.146.49	TCP	54

Frame 1: 62 bytes on wire (496 bits), 62 bytes captured (496 bits) on interface  
Linux cooked capture v1  
Internet Protocol Version 4, Src: 13.33.179.27, Dst: 10.0.2.15  
Transmission Control Protocol, Src Port: 443, Dst Port: 54020, Seq: 0, Ack: 1,  
VSS Monitoring Ethernet trailer, Source Port: 0

Hex	Dec	Text
0000:	00 00 00 01 00 06 52 54	00 12 35 02 00 00 08 00
0010:	45 00 00 2c 78 1d 00 00	40 06 36 64 9d 21 b3 1b
0020:	0a 00 82 0f 01 bb d3 04	02 80 a0 01 41 90 b7 b3
0030:	60 12 ff ff 5b 46 00 00	02 04 05 b4 00 00

enp0s3, any, and L... capture in progress: Packets: 704 Displayed: 704 (100.0%) Profile: Default

# Netcat



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window title is "adarsh@adarsh-VirtualBox: ~". The terminal content shows the user running the command "sudo dpkg-reconfigure wireshark-common" and then attempting to connect to port 20-80 on 10.0.2.15 using netcat (-z -v). The output indicates that all connections failed due to "Connection refused".

```
adarsh@adarsh-VirtualBox:~$ sudo dpkg-reconfigure wireshark-common
[sudo] password for adarsh:
adarsh@adarsh-VirtualBox:~$ nc -z -v 10.0.2.15 20-80
nc: connect to 10.0.2.15 port 20 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 21 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 22 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 23 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 24 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 25 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 26 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 27 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 28 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 29 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 30 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 31 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 32 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 33 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 34 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 35 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 36 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 37 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 38 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 39 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 40 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 41 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 42 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 43 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 44 (tcp) failed: Connection refused
nc: connect to 10.0.2.15 port 45 (tcp) failed: Connection refused
```

# **Networking and System Administration Lab**

## **Assignment: Docker Installation**

ADARSH S

ROLL NO : 03

RMCA-A Sem-II

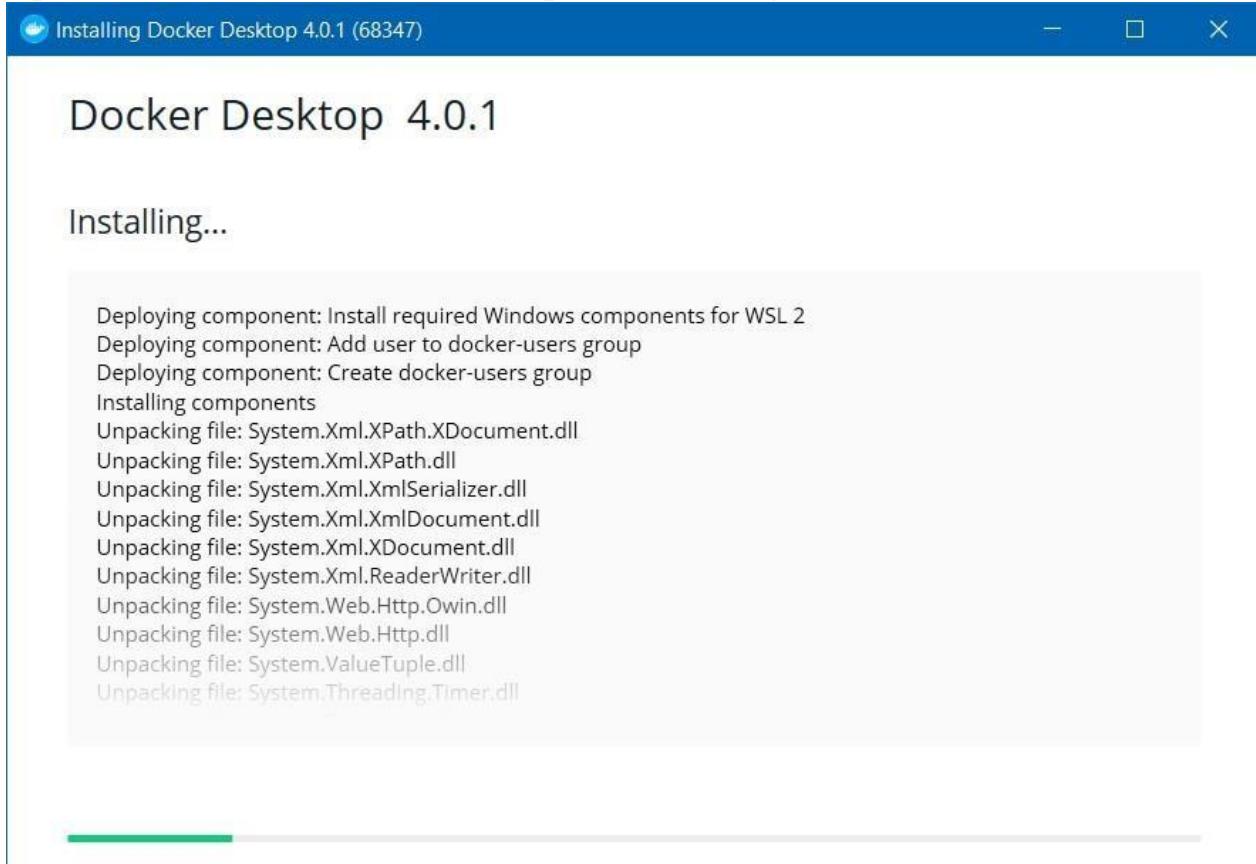
## Step-I

Download Docker Desktop installer for Windows from  
<https://desktop.docker.com/win/main/amd64/Docker%20Desktop%20Installer.exe>

 Docker Desktop Installer	9/29/2021 2:51 PM	Application	522,896 KB
--	-------------------	-------------	------------

## Step-II

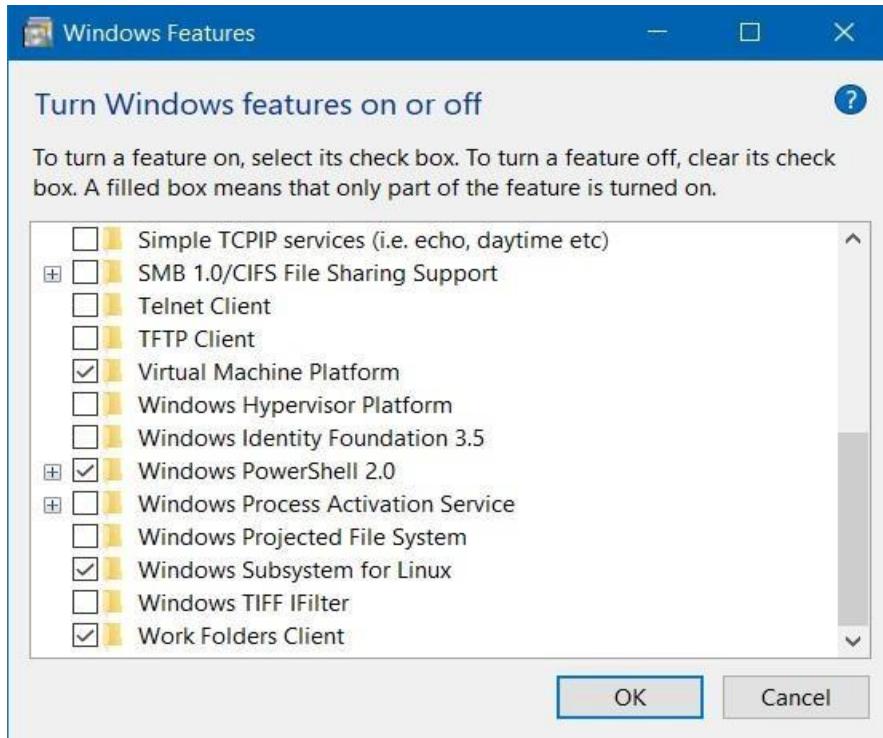
Open the .exe file and follow the steps after clicking install button.



## Step-III

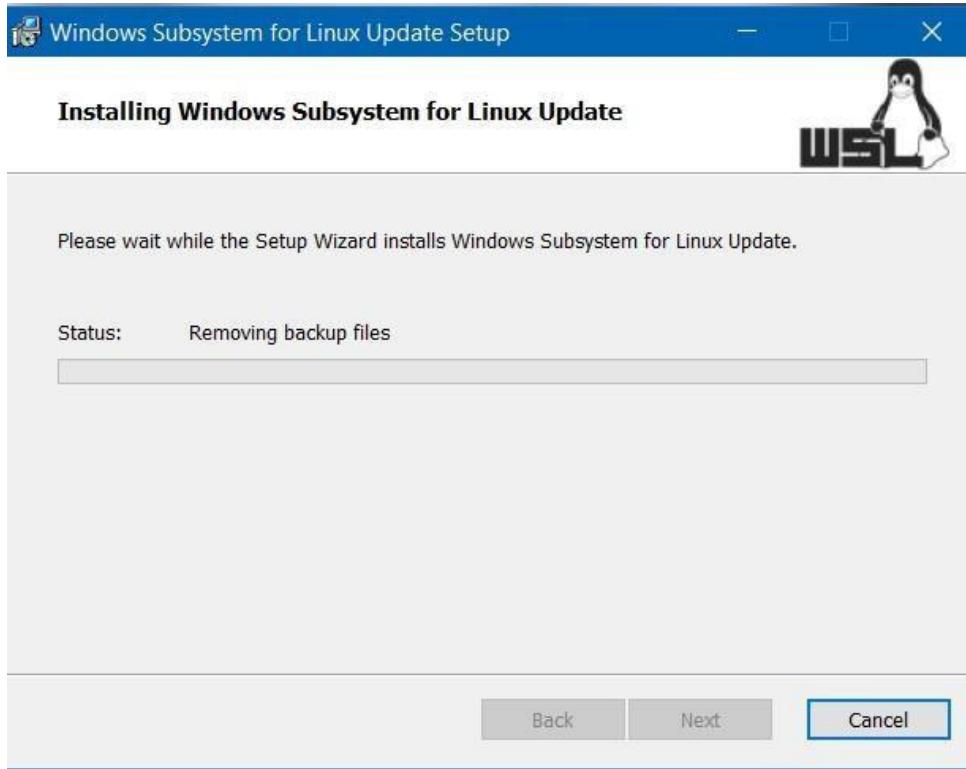
Once installed go to programs and features and click turn on windows features on or off

Scroll to the bottom and select windows subsystem for Linux



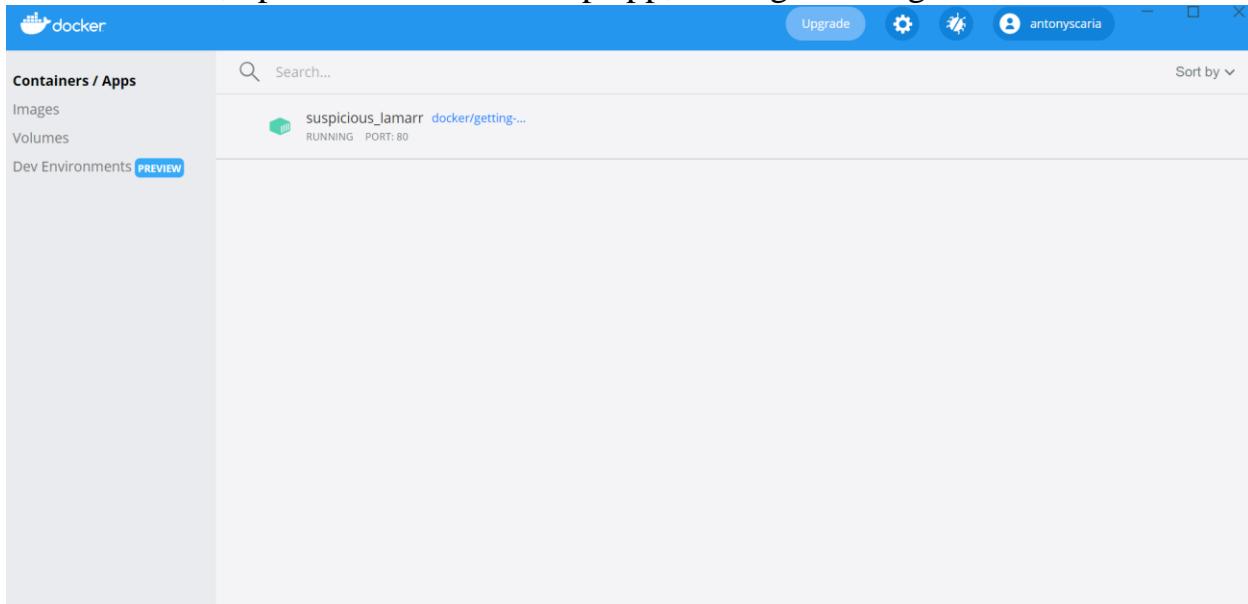
#### Step-IV

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.



## Step-V

Once installed, open the docker desktop app, and signin using the dockerID



## Step-VI

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

```
C:\> 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 192.168.65.5:53: 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: sha256:65de08a8dabf289ef114053ab32f79e0c333a4fbfa1fe3778bb13ae921a7849b
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

C:\Windows\system32>
```

Now in the images tab an image of ubuntu will be displayed, we can run the

## ubuntu instance using the cli.

The screenshot shows the Docker desktop application interface. The left sidebar has options: 'Containers / Apps', 'Images' (selected), 'Volumes', and 'Dev Environments' (with a 'PREVIEW' badge). The main area is titled 'Images on disk' and shows '2 images' with a total size of '100.76 MB'. A progress bar indicates 'IN USE' (green) and 'UNUSED' (grey). A 'Clean up...' button is at the top right. Below, there are tabs for 'LOCAL' (selected) and 'REMOTE REPOSITORIES'. A search bar and an 'In Use only' checkbox are present. A table lists the images:

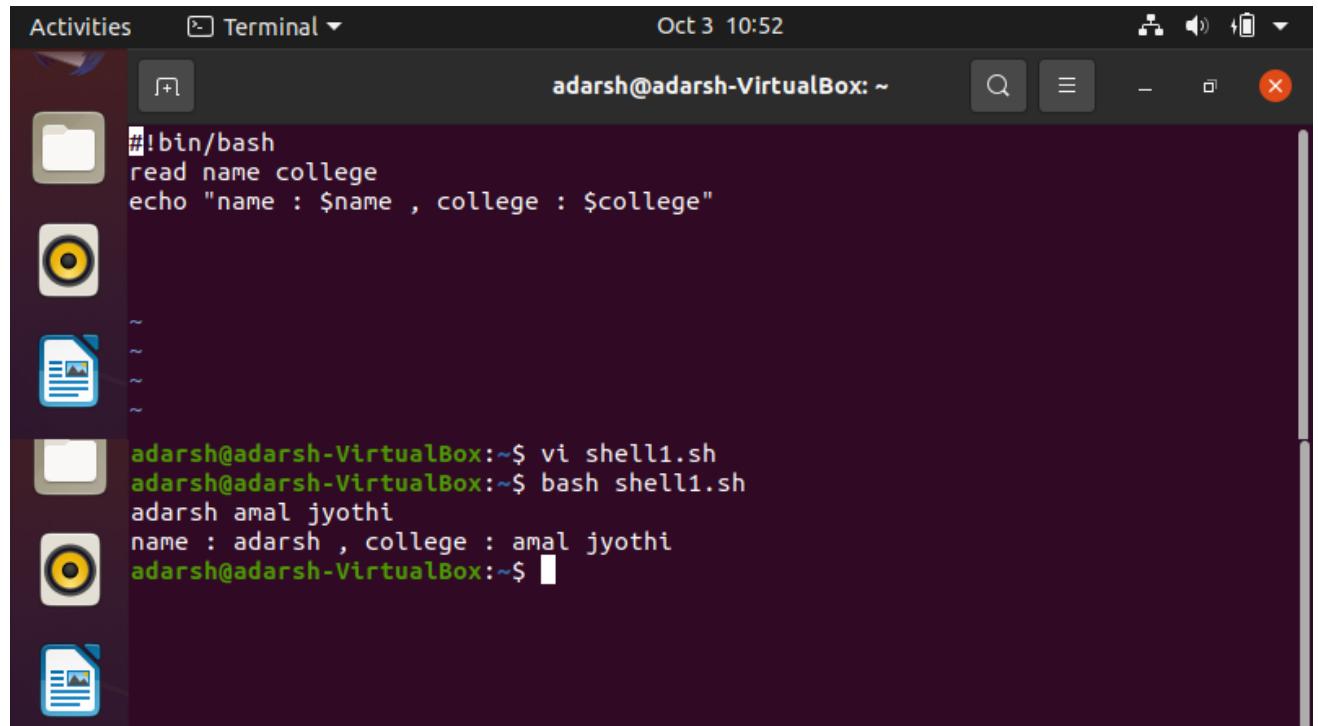
NAME	TAG	IMAGE ID	CREATED	SIZE
docker/getting-started	latest	083d7564d904	4 months ago	27.99 MB
ubuntu	latest	597ce1600cf4	1 day ago	72.78 MB

# **20MCA136-Networking & System Administration Lab**

## **Shell Scripting Lab Assignments**

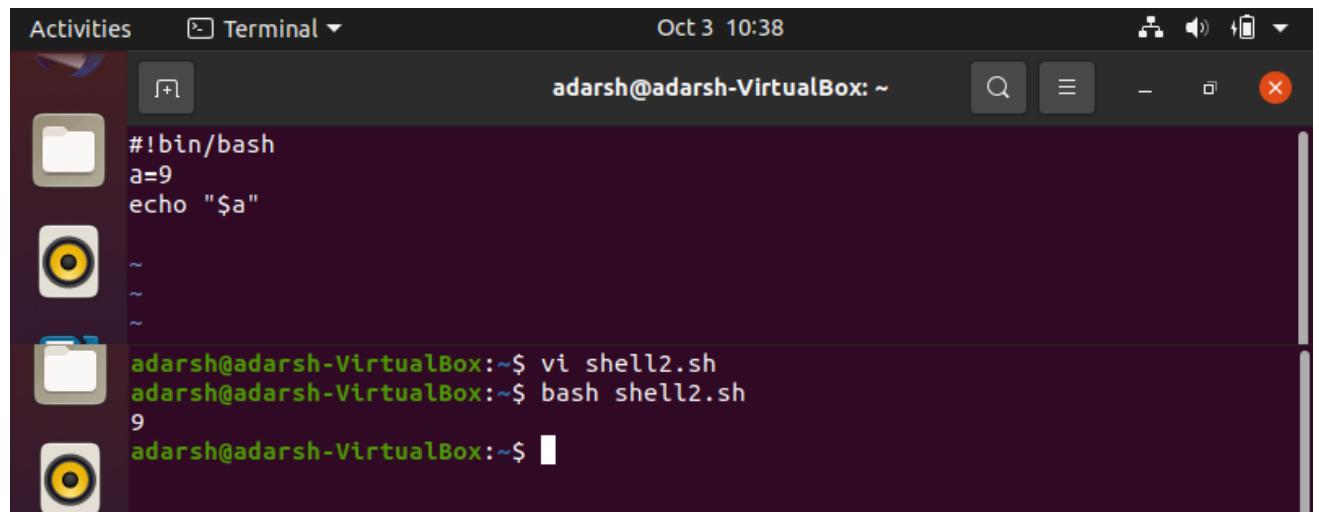
**ADARSH S  
03  
MCA A BATCH**

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



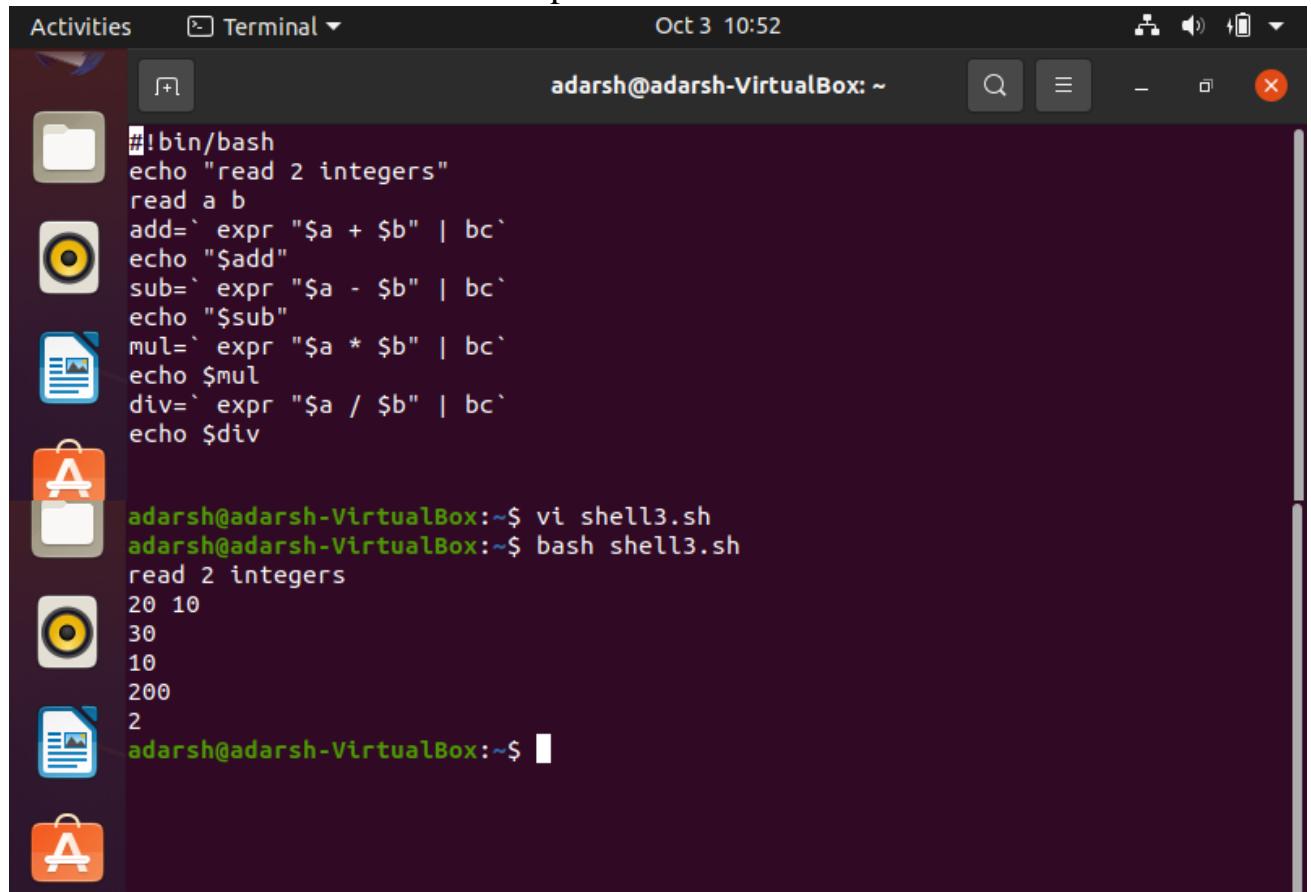
```
Activities Terminal Oct 3 10:52
adarsh@adarsh-VirtualBox: ~
#!/bin/bash
read name college
echo "name : $name , college : $college"
~
~
~
adarsh@adarsh-VirtualBox:~$ vi shell1.sh
adarsh@adarsh-VirtualBox:~$ bash shell1.sh
adarsh amal jyothi
name : adarsh , college : amal jyothi
adarsh@adarsh-VirtualBox:~$
```

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



```
Activities Terminal Oct 3 10:38
adarsh@adarsh-VirtualBox: ~
#!/bin/bash
a=9
echo "$a"
~
~
~
adarsh@adarsh-VirtualBox:~$ vi shell2.sh
adarsh@adarsh-VirtualBox:~$ bash shell2.sh
9
adarsh@adarsh-VirtualBox:~$
```

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



A screenshot of a Linux desktop environment showing a terminal window titled "Terminal". The terminal window has a dark background and displays the following content:

```
#!/bin/bash
echo "read 2 integers"
read a b
add=` expr "$a + $b" | bc`
echo "$add"
sub=` expr "$a - $b" | bc`
echo "$sub"
mul=` expr "$a * $b" | bc`
echo $mul
div=` expr "$a / $b" | bc`
echo $div

adarsh@adarsh-VirtualBox:~$ vi shell3.sh
adarsh@adarsh-VirtualBox:~$ bash shell3.sh
read 2 integers
20 10
30
10
200
2
adarsh@adarsh-VirtualBox:~$
```

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

```
#!/bin/bash
echo "Finding a number"

echo "Enter a number"
read a
if [ $a == 10];
then
    echo "Number found!"
else
    echo "Number not found!"
fi
```

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

```
#!/bin/bash
echo "Time and Calender"

echo "Today is $(date)"

echo "Calender"
```

6. Write a shell script to check a number is even or odd.

```
#!/bin/bash
echo "EVEN OR ODD"

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

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

```
#!/bin/bash
echo "avg, sum & product of 4 numbers"

echo "enter first number"
read a
echo "enter second number"
read b
echo "enter third number"
read c
echo "enter forth number"
read d

sum=$((a + b + c + d))
avg=$(echo $sum/4 | bc-l)
prod=$((a * b * c * d))

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

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

```
#!/bin/bash
echo "Sum of Numbers"

a=0
for (( i=1;i<=10;i++ ))
do
    a=`expr $a + $i`
done
echo "Sum of 10 numbers=$a"
```

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

```
#!/bin/bash
echo "avg, sum & product of 4 numbers"

echo "enter first number"
read a
echo "enter second number"
read b
echo "enter third number"
read c
echo "enter forth number"
read d

sum=$((a + b + c + d))
avg=$(echo $sum/4 | bc-l)
prod=$((a * b * c * d))

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

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

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

```
#!/bin/bash
echo "Factorial"

echo "enter a number"
read num
fact=1
for((i=2;i<=num;i++))
{
    fact=$((fact*i))
}
echo "factorial is $fact"
"
```

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

```
#!/bin/bash
echo "Palindrome or NOT"

echo "Enter number to check"
read n
rev=$(echo $n | rev)
if [ $n -eq $rev ];
then
    echo "Number is Palindrome"
else
    echo "Number is not Palindrome"
fi
```

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

```
#!/bin/bash
echo "Avg of n numbers"

echo "enter size"
read n
i=1
sum=0

echo "Enter numbers"
while [ $i -le $n ]
do
    read num
    sum=$((sum + num))
    i=$((i + 1))
done
avg=$(echo $sum/$n | bc -l)
echo $avg
```

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

```
#!/bin/bash
echo "Sum of all digits"

echo "Enter a number"
read num
sum=0

while [ $num -gt 0 ]
do
    mod=$((num % 10))
    sum=$((sum + mod))
    num=$((num / 10 ))
done
echo "Sum of digits is $sum"
```

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

```
#!/bin/bash
echo "Leap year or Not"

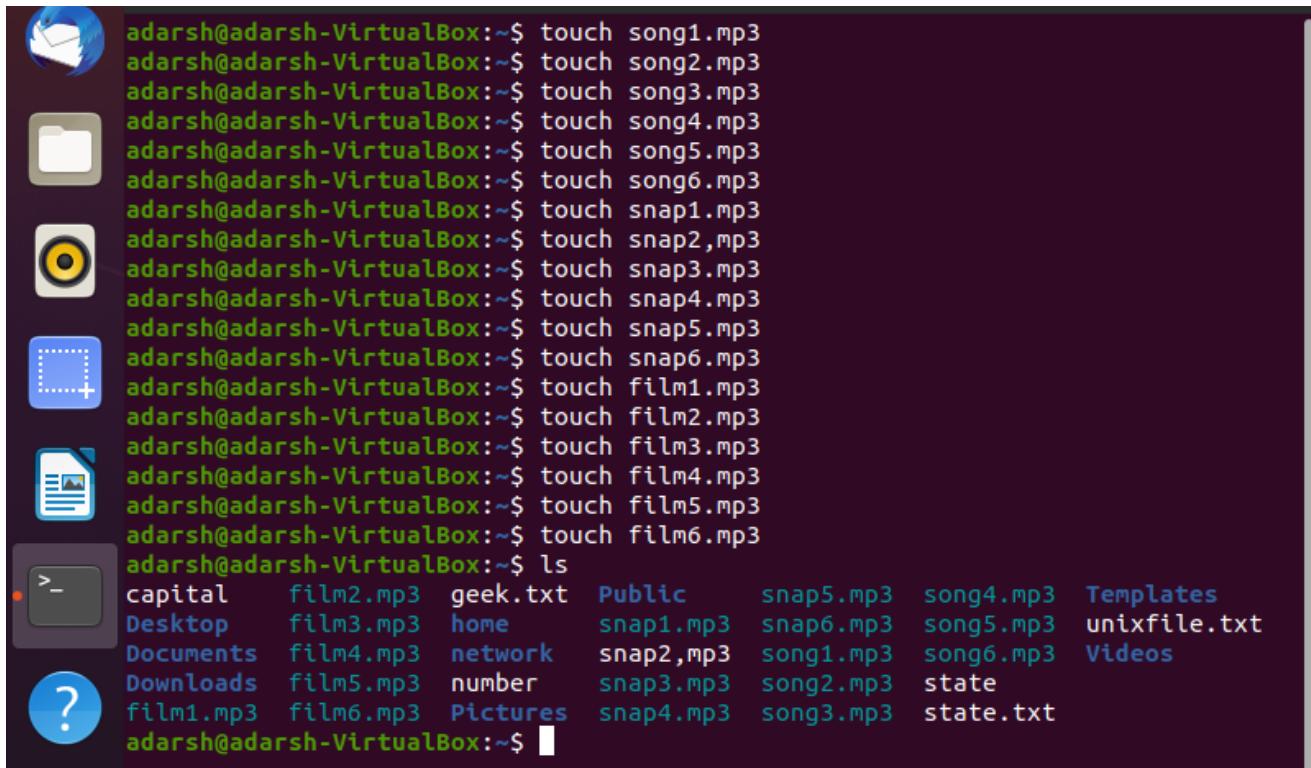
echo "Enter the year"
read y
a=`expr $y % 4`
b=`expr $y % 100`
c=`expr $y % 400`
if [ $a -eq 0 -a $b -ne 0 -o $c -eq 0];
then
    echo "$y is leap year"
else
    echo "$y is not leap year"
fi
```

# **ASSIGNMENT**

**Submitted  
To:Riny kurian**

**SUBMITTED BY:  
ADARSH S  
ROLL NO:03  
MCA BATCH A**

1. a. Create six files with name of the form songX.mp3
- b. Create six files with name of the form snapX.mp3
- c. Create six files with name of the form filmX.mp3 (In each set, replace X with the numbers 1 through 6)

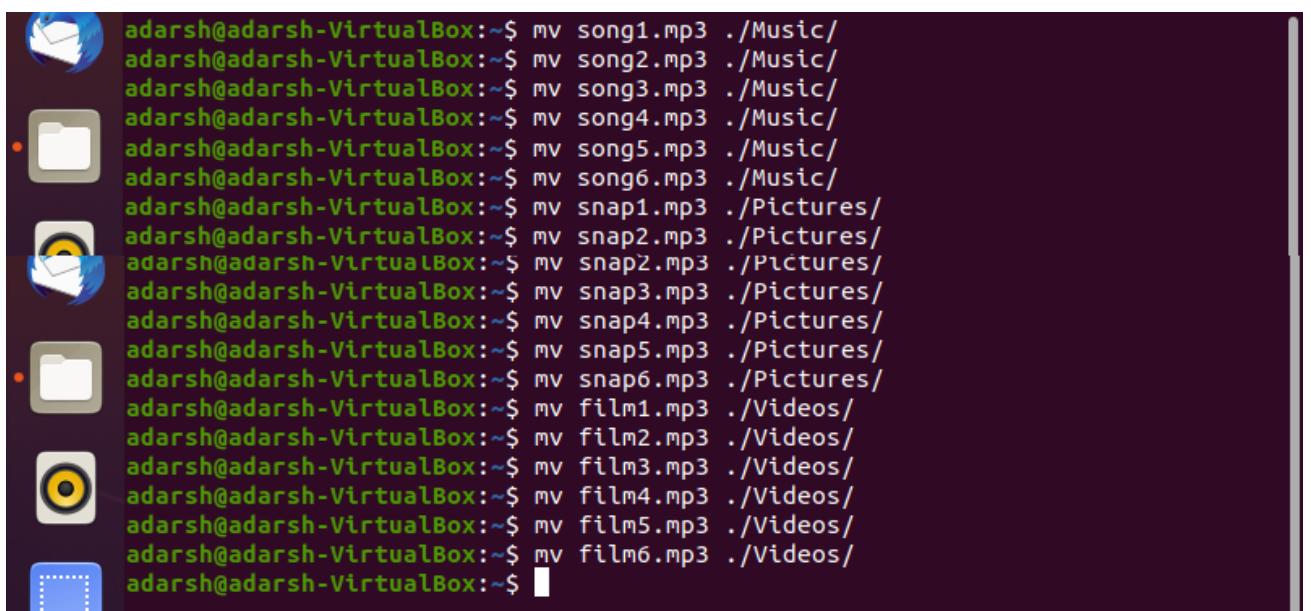


```

adarsh@adarsh-VirtualBox:~$ touch song1.mp3
adarsh@adarsh-VirtualBox:~$ touch song2.mp3
adarsh@adarsh-VirtualBox:~$ touch song3.mp3
adarsh@adarsh-VirtualBox:~$ touch song4.mp3
adarsh@adarsh-VirtualBox:~$ touch song5.mp3
adarsh@adarsh-VirtualBox:~$ touch song6.mp3
adarsh@adarsh-VirtualBox:~$ touch snap1.mp3
adarsh@adarsh-VirtualBox:~$ touch snap2.mp3
adarsh@adarsh-VirtualBox:~$ touch snap3.mp3
adarsh@adarsh-VirtualBox:~$ touch snap4.mp3
adarsh@adarsh-VirtualBox:~$ touch snap5.mp3
adarsh@adarsh-VirtualBox:~$ touch snap6.mp3
adarsh@adarsh-VirtualBox:~$ touch film1.mp3
adarsh@adarsh-VirtualBox:~$ touch film2.mp3
adarsh@adarsh-VirtualBox:~$ touch film3.mp3
adarsh@adarsh-VirtualBox:~$ touch film4.mp3
adarsh@adarsh-VirtualBox:~$ touch film5.mp3
adarsh@adarsh-VirtualBox:~$ touch film6.mp3
adarsh@adarsh-VirtualBox:~$ ls
capital    film2.mp3  geek.txt  Public      snap5.mp3  song4.mp3  Templates
Desktop   film3.mp3  home       snap1.mp3  snap6.mp3  song5.mp3  unixfile.txt
Documents  film4.mp3  network    snap2.mp3  snap3.mp3  song1.mp3  song6.mp3  Videos
Downloads  film5.mp3  number     snap4.mp3  snap5.mp3  song2.mp3  state
film1.mp3  film6.mp3  Pictures   snap6.mp3  snap3.mp3  song3.mp3  state.txt
adarsh@adarsh-VirtualBox:~$ 

```

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

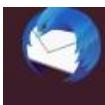


```

adarsh@adarsh-VirtualBox:~$ mv song1.mp3 ./Music/
adarsh@adarsh-VirtualBox:~$ mv song2.mp3 ./Music/
adarsh@adarsh-VirtualBox:~$ mv song3.mp3 ./Music/
adarsh@adarsh-VirtualBox:~$ mv song4.mp3 ./Music/
adarsh@adarsh-VirtualBox:~$ mv song5.mp3 ./Music/
adarsh@adarsh-VirtualBox:~$ mv song6.mp3 ./Music/
adarsh@adarsh-VirtualBox:~$ mv snap1.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv snap2.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv snap2.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv snap3.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv snap4.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv snap5.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv snap6.mp3 ./Pictures/
adarsh@adarsh-VirtualBox:~$ mv film1.mp3 ./Videos/
adarsh@adarsh-VirtualBox:~$ mv film2.mp3 ./Videos/
adarsh@adarsh-VirtualBox:~$ mv film3.mp3 ./Videos/
adarsh@adarsh-VirtualBox:~$ mv film4.mp3 ./Videos/
adarsh@adarsh-VirtualBox:~$ mv film5.mp3 ./Videos/
adarsh@adarsh-VirtualBox:~$ mv film6.mp3 ./Videos/
adarsh@adarsh-VirtualBox:~$ 

```

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.



```
adarsh@adarsh-VirtualBox:~$ mkdir friends family work  
adarsh@adarsh-VirtualBox:~$
```

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



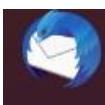
```
adarsh@adarsh-VirtualBox:~$ cp Music/song1.mp3 Music/song2.mp3 Music/song3.mp3  
Music/song4.mp3 Music/song5.mp3 Music/song6.mp3 friends  
adarsh@adarsh-VirtualBox:~$ cp Pictures/snap1.mp3 Pictures/snap2.mp3 Pictures/s  
nap3.mp3 Pictures/snap4.mp3 Pictures/snap5.mp3 Pictures/snap6.mp3 family  
adarsh@adarsh-VirtualBox:~$
```

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



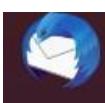
```
adarsh@adarsh-VirtualBox:~$ rmdir family friends  
rmdir: failed to remove 'family': Directory not empty  
rmdir: failed to remove 'friends': Directory not empty  
adarsh@adarsh-VirtualBox:~$
```

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



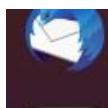
```
adarsh@adarsh-VirtualBox:~$ rm -r family friends  
adarsh@adarsh-VirtualBox:~$
```

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



```
adarsh@adarsh-VirtualBox:~$ ls -a >allfiles.txt  
adarsh@adarsh-VirtualBox:~$
```

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



```
adarsh@adarsh-VirtualBox:~$ date
Friday 24 September 2021 12:01:31 PM IST
adarsh@adarsh-VirtualBox:~$
```

9. Add the user Juliet



```
adarsh@adarsh-VirtualBox:~$ sudo useradd juliet
[sudo] password for adarsh:
adarsh@adarsh-VirtualBox:~$
```

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



```
adarsh@adarsh-VirtualBox:~$ cat /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:/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
in
```

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



```
adarsh@adarsh-VirtualBox:~$ sudo passwd juliet
New password:
Retype new password:
passwd: password updated successfully
adarsh@adarsh-VirtualBox:~$
```

12. Create a supplementary group called Shakespeare with a group id of 30000

 adarsh@adarsh-VirtualBox:~\$ sudo groupadd -g 30000 Shakespeare

13. Create a supplementary group called artists

 adarsh@adarsh-VirtualBox:~\$ sudo groupadd -g 2000 artists

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

 adarsh@adarsh-VirtualBox:~\$ cat /etc/group  
root:x:0:  
daemon:x:1:  
bin:x:2:  
sys:x:3:  
adm:x:4:syslog,adarsh  
tty:x:5:syslog  
disk:x:6:  
lp:x:7:  
mail:x:8:

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

 adarsh@adarsh-VirtualBox:~\$ groups juliet  
juliet : juliet  
adarsh@adarsh-VirtualBox:~\$ sudo usermod -a -G Shakespeare juliet  
adarsh@adarsh-VirtualBox:~\$

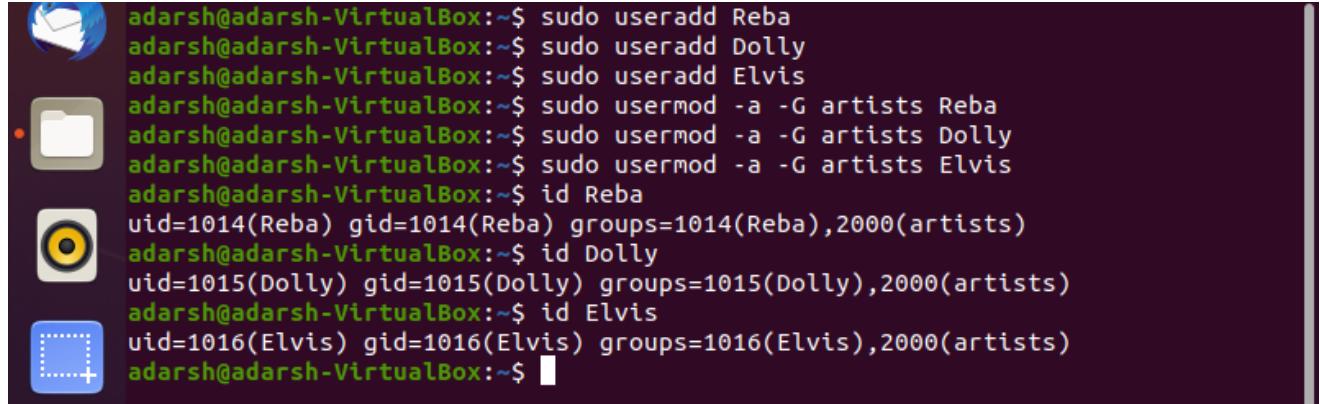
16. Confirm that Juliet has been added using the id command

 adarsh@adarsh-VirtualBox:~\$ id juliet  
uid=1011(juliet) gid=1011(juliet) groups=1011(juliet),3006(Shakespeare)  
adarsh@adarsh-VirtualBox:~\$

17. Add Romeo and Hamlet to the Shakespeare group

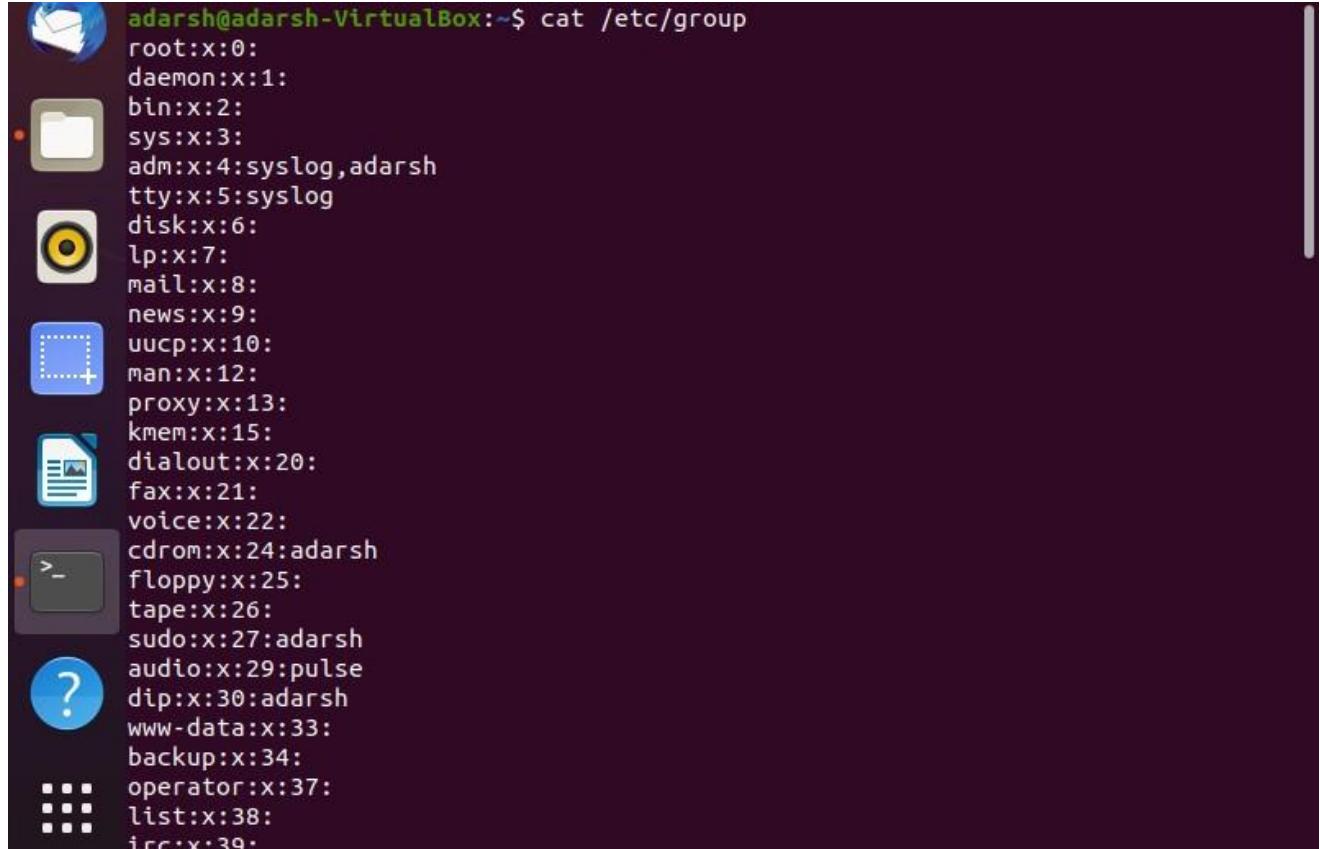
 adarsh@adarsh-VirtualBox:~\$ sudo useradd Romeo  
adarsh@adarsh-VirtualBox:~\$ sudo useradd Hamlet  
adarsh@adarsh-VirtualBox:~\$ sudo usermod -a -G Shakespeare Romeo  
adarsh@adarsh-VirtualBox:~\$ sudo usermod -a -G Shakespeare Hamlet  
adarsh@adarsh-VirtualBox:~\$ id Romeo  
uid=1012(Romeo) gid=1012(Romeo) groups=1012(Romeo),3006(Shakespeare)  
adarsh@adarsh-VirtualBox:~\$ id Hamlet  
uid=1013(Hamlet) gid=1013(Hamlet) groups=1013(Hamlet),3006(Shakespeare)  
adarsh@adarsh-VirtualBox:~\$

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



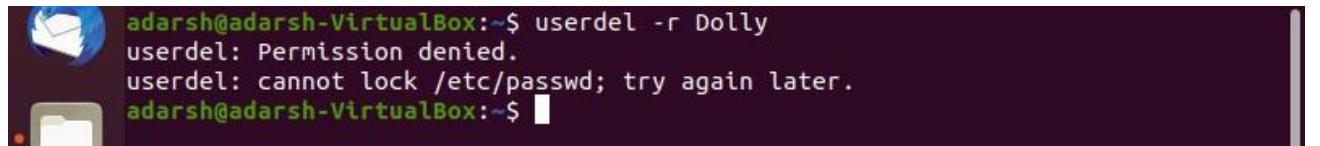
```
adarsh@adarsh-VirtualBox:~$ sudo useradd Reba
adarsh@adarsh-VirtualBox:~$ sudo useradd Dolly
adarsh@adarsh-VirtualBox:~$ sudo useradd Elvis
adarsh@adarsh-VirtualBox:~$ sudo usermod -a -G artists Reba
adarsh@adarsh-VirtualBox:~$ sudo usermod -a -G artists Dolly
adarsh@adarsh-VirtualBox:~$ sudo usermod -a -G artists Elvis
adarsh@adarsh-VirtualBox:~$ id Reba
uid=1014(Reba) gid=1014(Reba) groups=1014(Reba),2000(artists)
adarsh@adarsh-VirtualBox:~$ id Dolly
uid=1015(Dolly) gid=1015(Dolly) groups=1015(Dolly),2000(artists)
adarsh@adarsh-VirtualBox:~$ id Elvis
uid=1016(Elvis) gid=1016(Elvis) groups=1016(Elvis),2000(artists)
adarsh@adarsh-VirtualBox:~$
```

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



```
adarsh@adarsh-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,adarsh
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:adarsh
floppy:x:25:
tape:x:26:
sudo:x:27:adarsh
audio:x:29:pulse
dip:x:30:adarsh
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
```

20. Attempt to remove user Dolly



```
adarsh@adarsh-VirtualBox:~$ userdel -r Dolly
userdel: Permission denied.
userdel: cannot lock /etc/passwd; try again later.
adarsh@adarsh-VirtualBox:~$
```

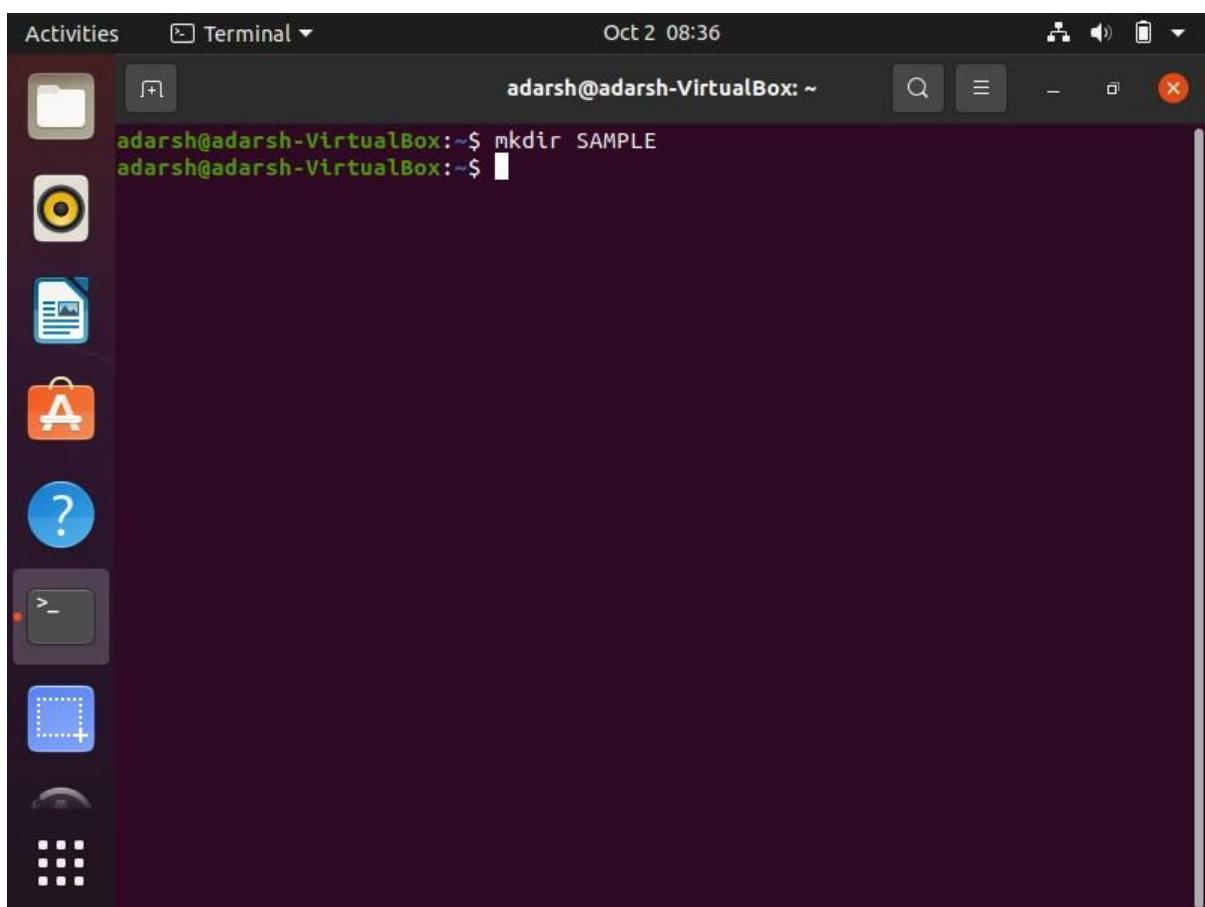
## **Networking & System Administration Lab Model Exam Model Exam**

**Adarsh s**

**MCA A**

**Roll no: 03**

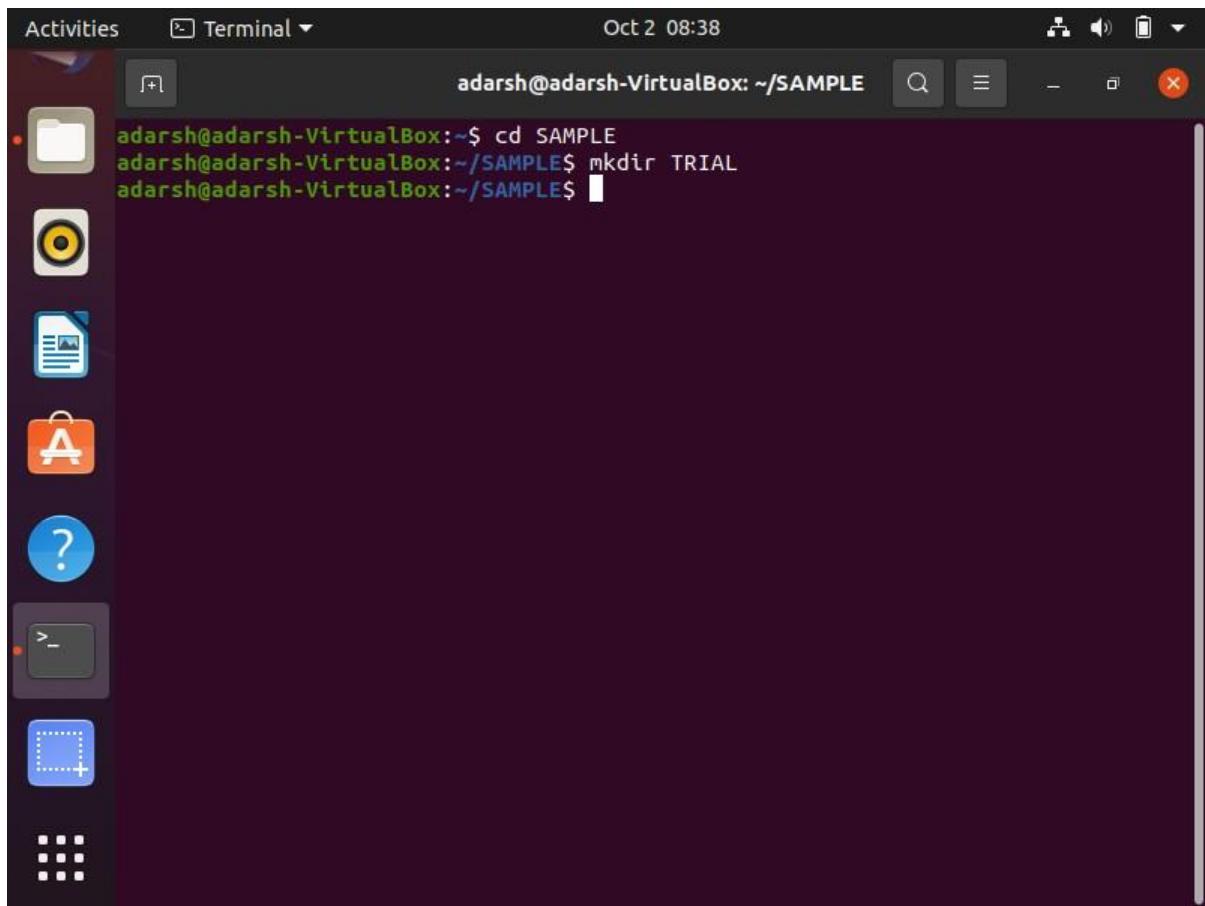
1. Create a directory SAMPLE under your home director



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window. The terminal window is titled "Terminal" and has the command "adarsh@adarsh-VirtualBox: ~" in the title bar. The date and time "Oct 2 08:36" are also displayed. The terminal content shows the command "mkdir SAMPLE" being run, followed by a new line. The desktop interface includes a dock on the left with various icons for applications like the Dash, Home, and System Settings.

```
adarsh@adarsh-VirtualBox:~$ mkdir SAMPLE  
adarsh@adarsh-VirtualBox:~$
```

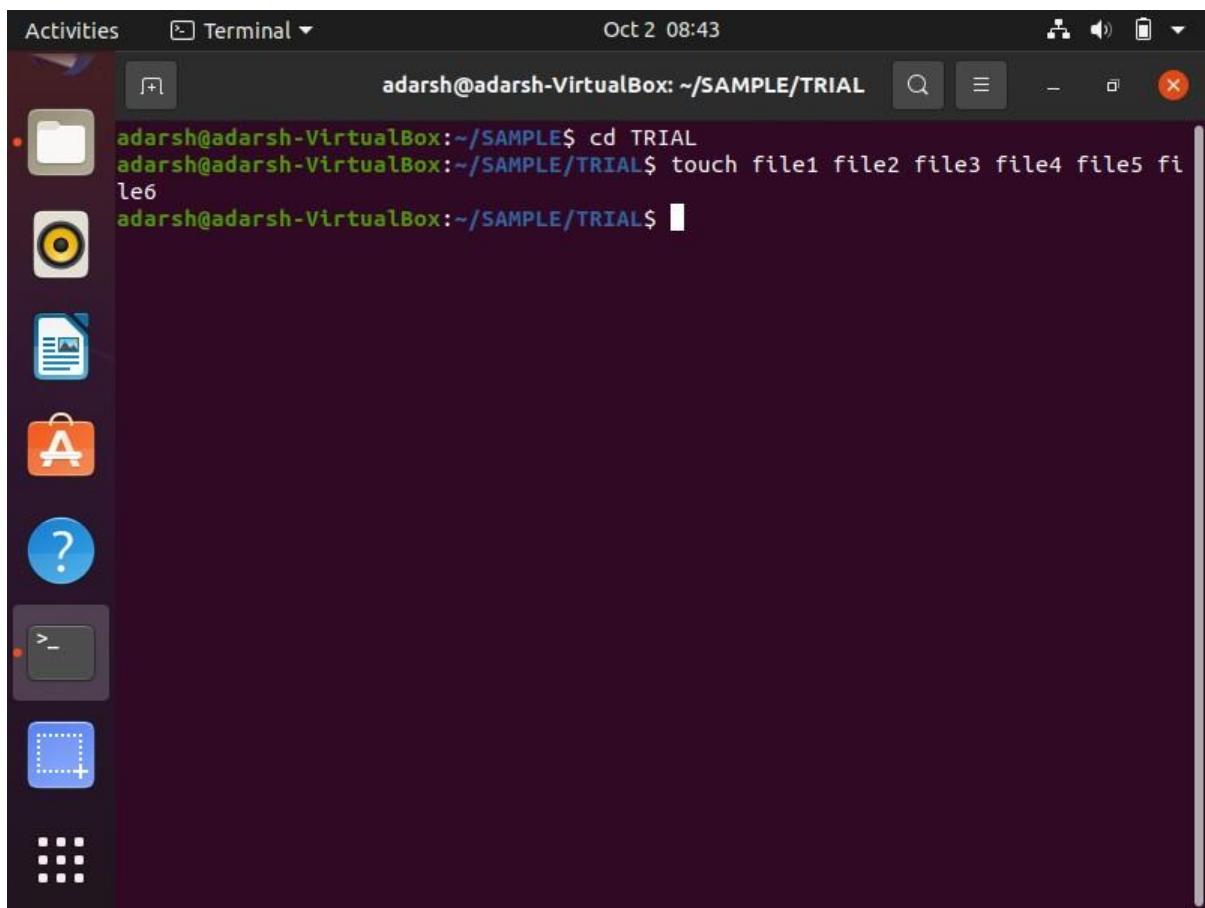
2. Create a sub-directory by name TRIAL under SAMPLE



The image shows a screenshot of an Ubuntu desktop environment. On the left, there is a vertical dock with several icons: a folder, a target, a document, a terminal, a question mark, a terminal (selected), a square with a plus sign, and a grid. At the top, the title bar says "Activities Terminal" and the date and time are "Oct 2 08:38". The main window is a terminal window titled "adarsh@adarsh-VirtualBox: ~/SAMPLE". The terminal contains the following text:

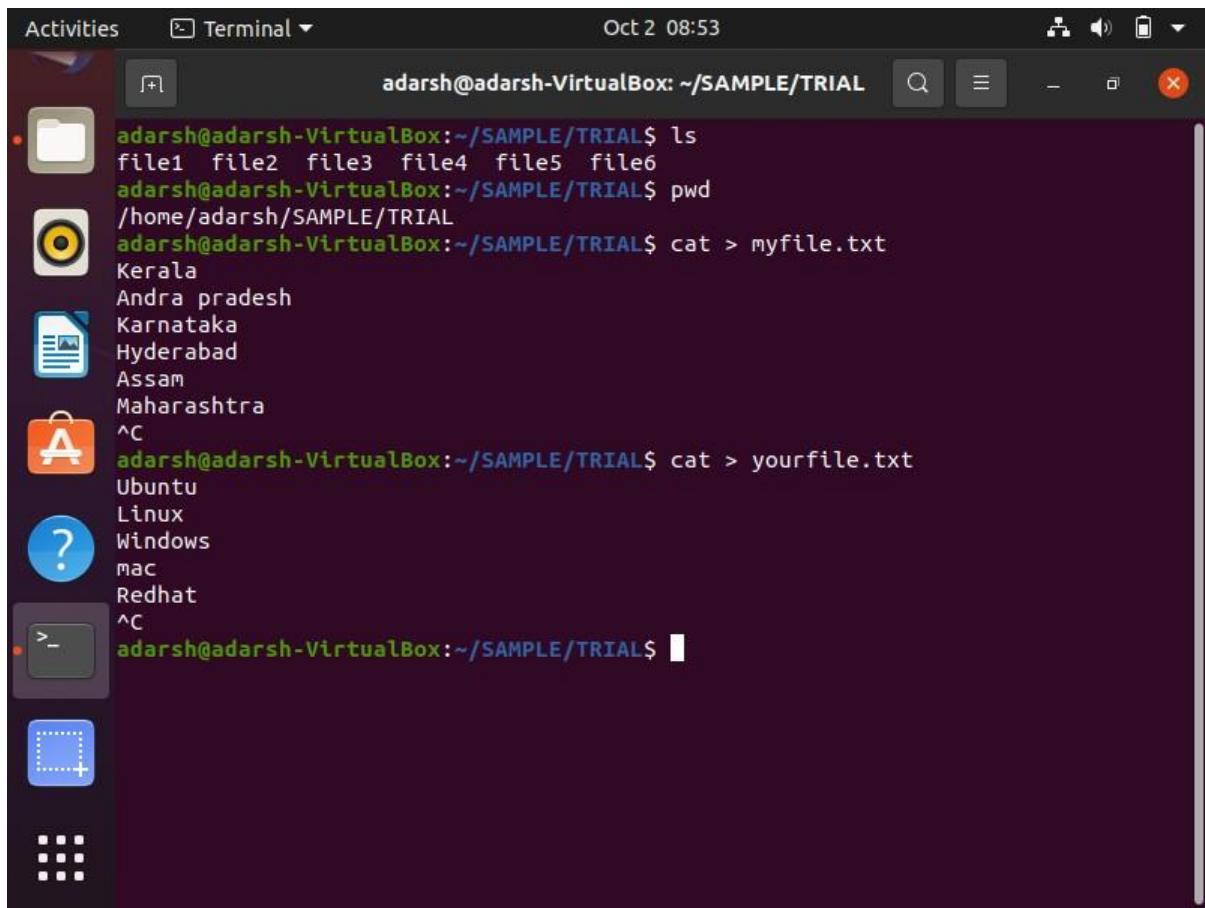
```
adarsh@adarsh-VirtualBox:~$ cd SAMPLE
adarsh@adarsh-VirtualBox:~/SAMPLE$ mkdir TRIAL
adarsh@adarsh-VirtualBox:~/SAMPLE$
```

3. Create file1,file2, file3, file4, file5, file6 under TRIAL directory using a single command.

A screenshot of an Ubuntu desktop environment. On the left is a vertical dock with icons for Dash, Home, Applications, Help, and several system indicators. The main area shows a terminal window titled "Terminal". The terminal window has a dark background and displays the following command-line session:

```
adarsh@adarsh-VirtualBox:~/SAMPLE$ cd TRIAL  
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ touch file1 file2 file3 file4 file5 fi  
le6  
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$
```

4. Create files myfile and yourfile under Present Working Directory



The image shows a screenshot of an Ubuntu desktop environment. On the left, there is a dock with several icons: a folder, a target, a document, a question mark, and a terminal. The terminal window is open and displays the following command-line session:

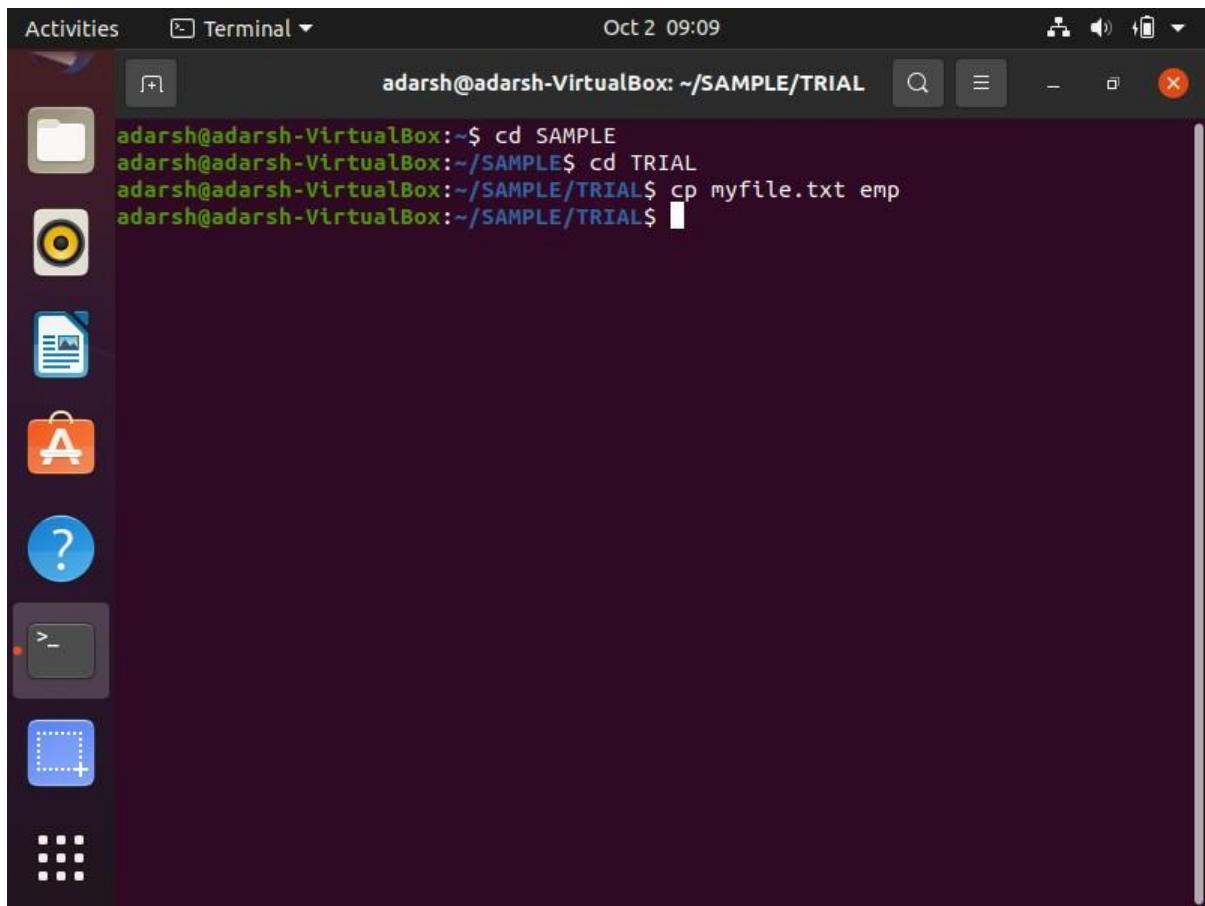
```
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ ls
file1 file2 file3 file4 file5 file6
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ pwd
/home/adarsh/SAMPLE/TRIAL
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ cat > myfile.txt
Kerala
Andra pradesh
Karnataka
Hyderabad
Assam
Maharashtra
^C
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ cat > yourfile.txt
Ubuntu
Linux
Windows
mac
Redhat
^C
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$
```

5. Display the contents in myfile and yourfile.

The screenshot shows a Linux desktop environment with a dark theme. On the left, there's a vertical dock containing icons for a file browser, terminal, and other applications. The terminal window is open and displays the following command-line session:

```
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ cat myfile.txt
Kerala
Andra pradesh
Karnataka
Hyderabad
Assam
Maharashtra
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ cat yourfile.txt
Ubuntu
Linux
Windows
mac
Redhat
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$
```

6. Copy myfile file to emp

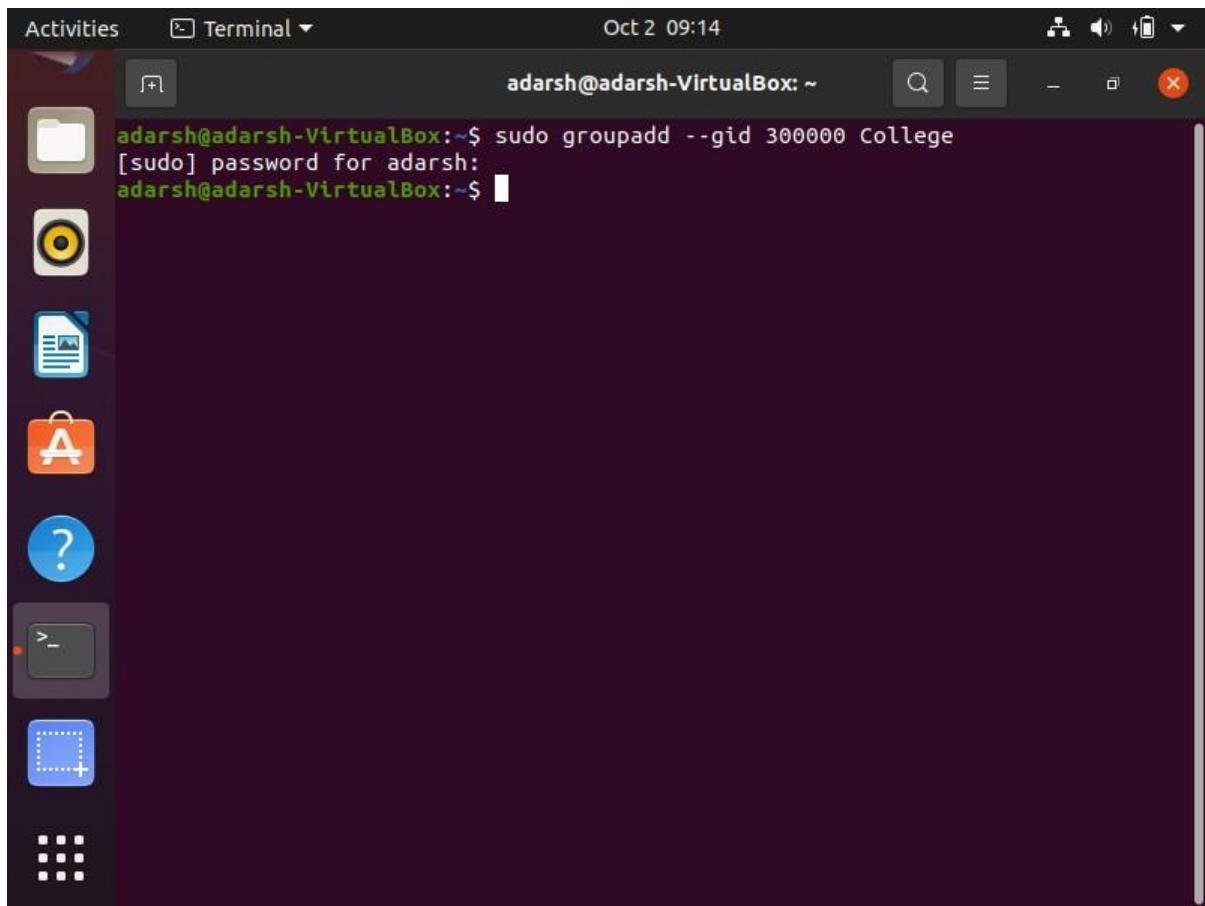
A screenshot of an Ubuntu desktop environment. On the left is a vertical dock with icons for File Manager, Dash, Home, Applications, Help, and a terminal. The main window is a terminal window titled "Terminal". The terminal shows the following command-line session:

```
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ cd SAMPLE
adarsh@adarsh-VirtualBox:~/SAMPLE$ cd TRIAL
adarsh@adarsh-VirtualBox:~/SAMPLE/TRIAL$ cp myfile.txt emp
```

7. Create a supplementary group called College with a group id 30000.Check group is created or not.

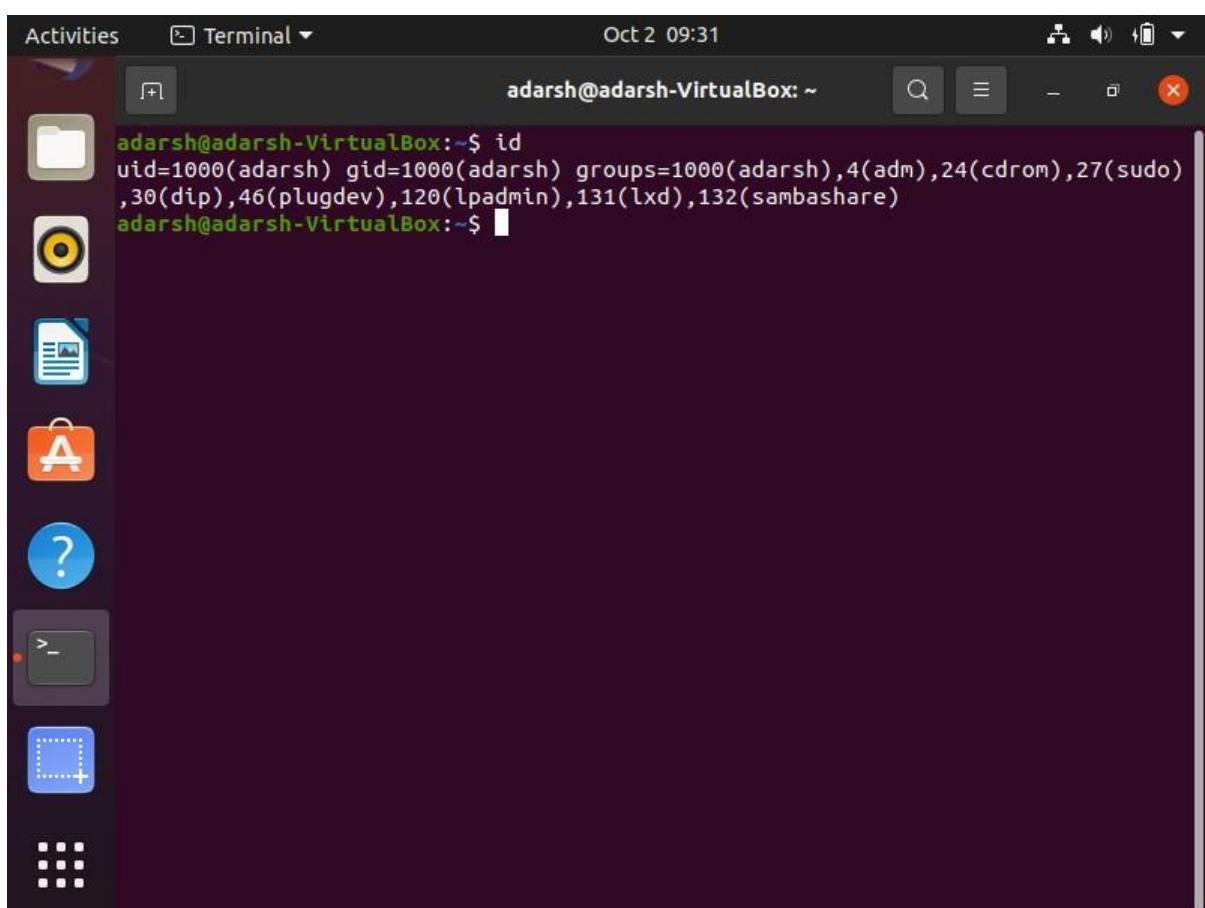
Activities Terminal Oct 2 09:14

```
adarsh@adarsh-VirtualBox:~$ sudo groupadd --gid 300000 College
[sudo] password for adarsh:
adarsh@adarsh-VirtualBox:~$
```



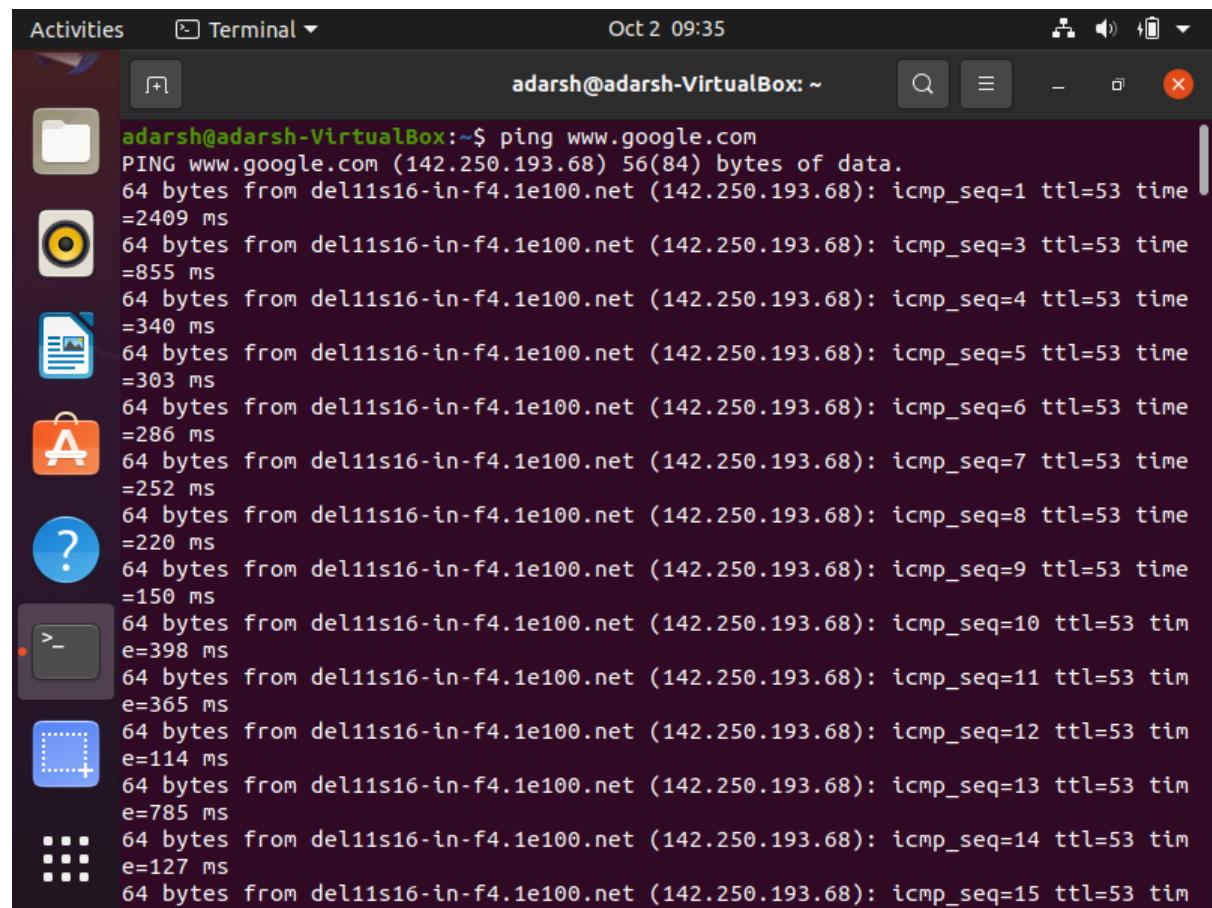
Activities Terminal Oct 2 09:31

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



8. Execute the following commands and write their output a.

Ping



```
adarsh@adarsh-VirtualBox:~$ ping www.google.com
PING www.google.com (142.250.193.68) 56(84) bytes of data.
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=1 ttl=53 time=2409 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=3 ttl=53 time=855 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=4 ttl=53 time=340 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=5 ttl=53 time=303 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=6 ttl=53 time=286 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=7 ttl=53 time=252 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=8 ttl=53 time=220 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=9 ttl=53 time=150 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=10 ttl=53 time=398 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=11 ttl=53 time=365 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=12 ttl=53 time=114 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=13 ttl=53 time=785 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=14 ttl=53 time=127 ms
64 bytes from del11s16-in-f4.1e100.net (142.250.193.68): icmp_seq=15 ttl=53 time
```

Traceroute

Activities Terminal Oct 2 09:39

```
adarsh@adarsh-VirtualBox:~$ traceroute google.com
traceroute to google.com (142.250.196.78), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2)  0.742 ms  0.711 ms  0.675 ms
 2 _gateway (10.0.2.2)  176.514 ms  176.489 ms  180.459 ms
adarsh@adarsh-VirtualBox:~$
```

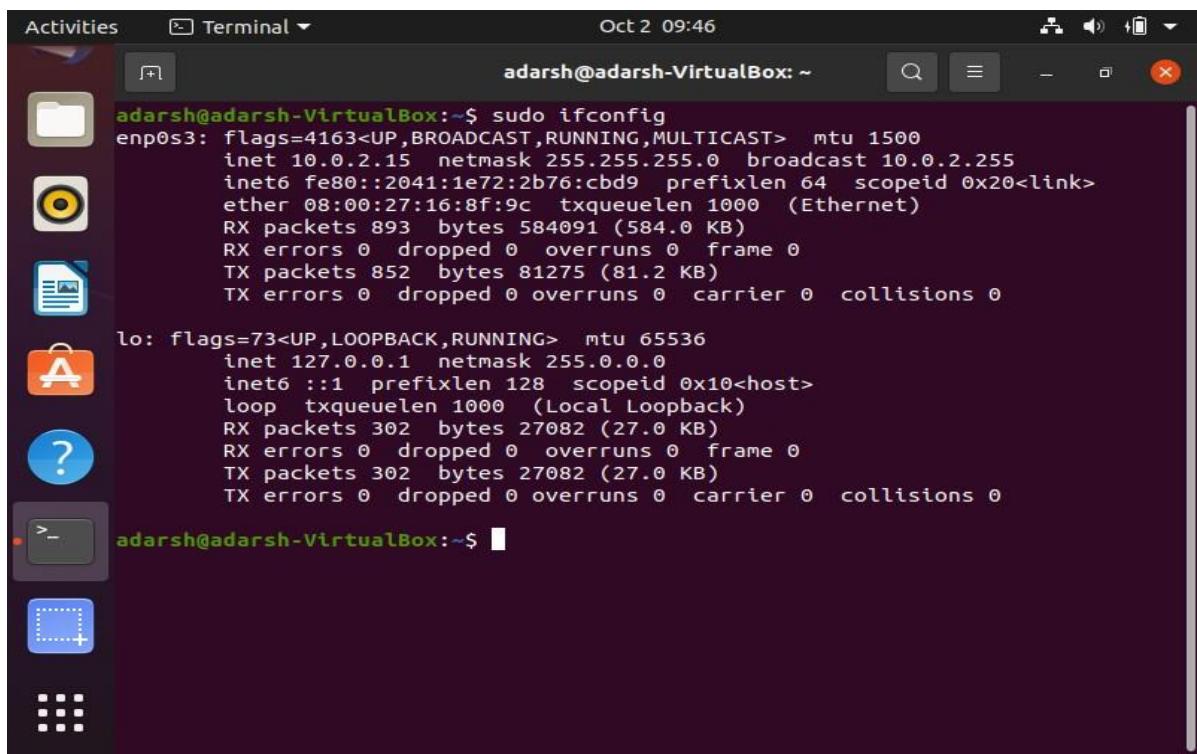
Netstat

Activities Terminal Oct 2 09:46

```
adarsh@adarsh-VirtualBox:~$ sudo netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
tcp      0      0 adarsh-VirtualBox:33716  43.255.166.254:http    TIME_WAIT
udp      0      0 adarsh-VirtualBo:bootpc _gateway:bootps      ESTABLISHED

Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type      State         I-Node Path
unix    2      [ ]     DGRAM           27186   /run/user/1000/systemd/notify
unix    4      [ ]     DGRAM           15510   /run/systemd/notify
unix    2      [ ]     DGRAM           15524   /run/systemd/journal
/syslog
unix  17      [ ]     DGRAM           15534   /run/systemd/journal
/dev-log
unix  8      [ ]     DGRAM           15538   /run/systemd/journal
/socket
unix  3      [ ]     STREAM  CONNECTED    28101   /run/user/1000/bus
unix  3      [ ]     STREAM  CONNECTED    30046   /run/user/1000/bus
unix  3      [ ]     STREAM  CONNECTED    29079   /run/systemd/journal
/stdout
unix  3      [ ]     STREAM  CONNECTED    26070   /run/systemd/journal
unix  3      [ ]     STREAM  CONNECTED    28100   /run/systemd/journal
unix  3      [ ]     STREAM  CONNECTED    26060   /run/systemd/journal
/stdout
unix  3      [ ]     STREAM  CONNECTED    30047   /run/user/1000/bus
unix  3      [ ]     STREAM  CONNECTED    28876   /run/user/1000/bus
unix  2      [ ]     DGRAM           26191   /run/user/1000/bus
unix  3      [ ]     STREAM  CONNECTED    28150   /run/user/1000/bus
unix  3      [ ]     STREAM  CONNECTED    24002   /run/user/1000/bus
```

## Ifconfig



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window titled "Terminal". The terminal window has a dark background and displays the command "sudo ifconfig" followed by its output. The output shows two network interfaces: "enp0s3" and "lo". The "enp0s3" interface is an Ethernet interface with an IP address of 10.0.2.15, a netmask of 255.255.255.0, and a broadcast address of 10.0.2.255. The "lo" interface is a loopback interface with an IP address of 127.0.0.1 and a netmask of 255.0.0.0. Both interfaces show statistics for RX and TX packets, errors, and collisions.

```
adarsh@adarsh-VirtualBox:~$ sudo ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.2.15 brd 10.0.2.255 netmask 255.255.255.0
              broadcast 10.0.2.255
        inet6 fe80::2041:1e72:2b76:cbd9 brd fe80::ff72:2b76:cbd9/128
              prefixlen 64 scopeid 0x20<link>
        ether 08:00:27:16:8f:9c txqueuelen 1000 (Ethernet)
      RX packets 893 bytes 584091 (584.0 KB)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 852 bytes 81275 (81.2 KB)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
      inet 127.0.0.1 brd 127.0.0.1 netmask 255.0.0.0
            broadcast 127.0.0.1
      inet6 ::1 brd ::1 prefixlen 128 scopeid 0x10<host>
            loop txqueuelen 1000 (Local Loopback)
      RX packets 302 bytes 27082 (27.0 KB)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 302 bytes 27082 (27.0 KB)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

adarsh@adarsh-VirtualBox:~$
```