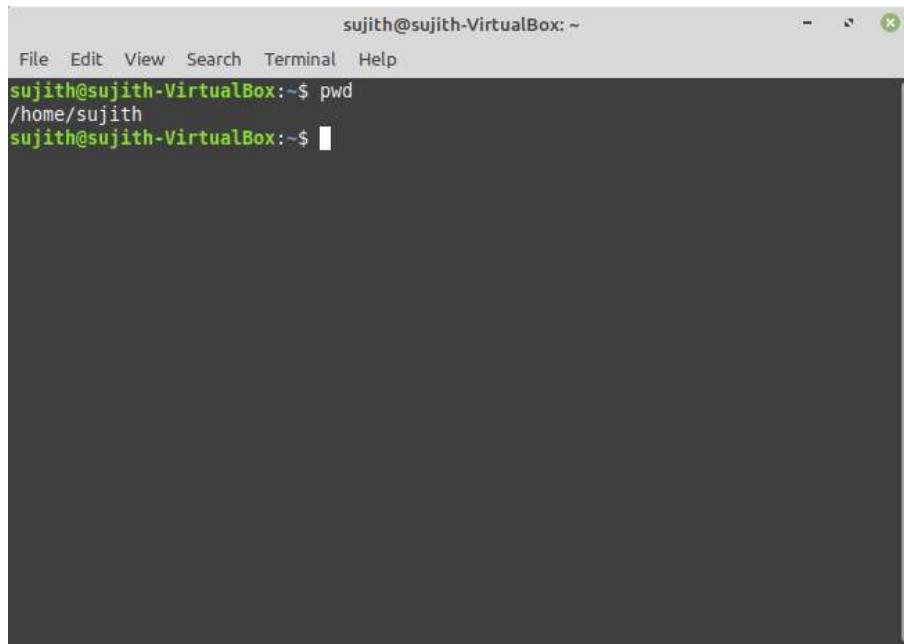


## Basic Linux Commands

### 1) PWD (Print Working Word)

- Used to find the path of the current working directory
- Absolute path Which is basically a path of all the directories that start with a forward slash(\)



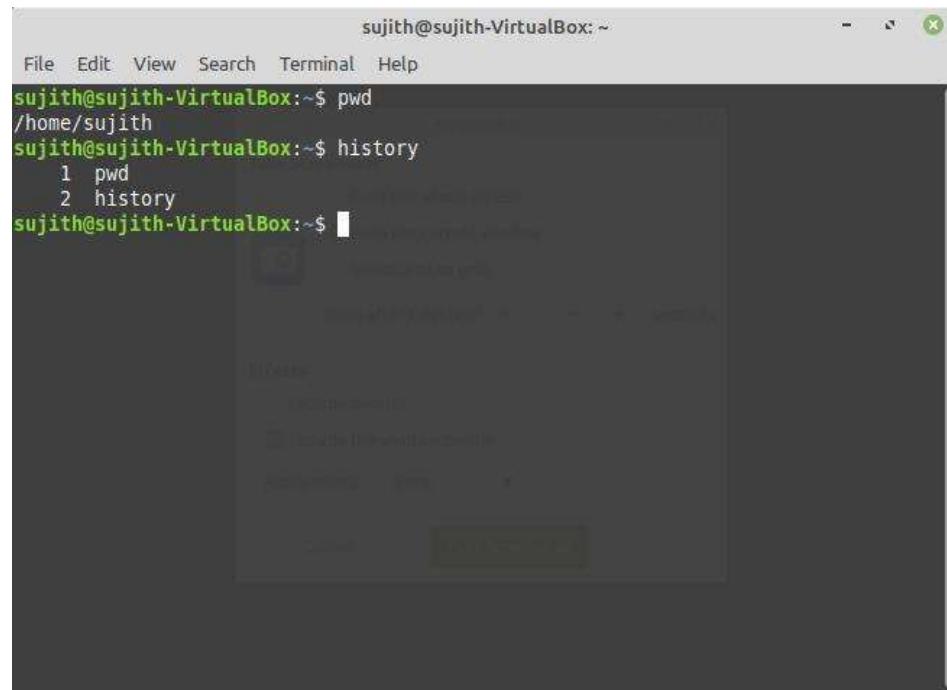
A screenshot of a terminal window titled "sujith@sujith-VirtualBox: ~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area of the terminal shows the command "pwd" being run and its output "/home/sujith". The terminal window has a dark background and light-colored text.

```
sujith@sujith-VirtualBox:~$ pwd
/home/sujith
sujith@sujith-VirtualBox:~$
```

- **Relative path** defined as the path related to the present working directory  
From root directory

### 2) History

- To review the commands, you have entered before

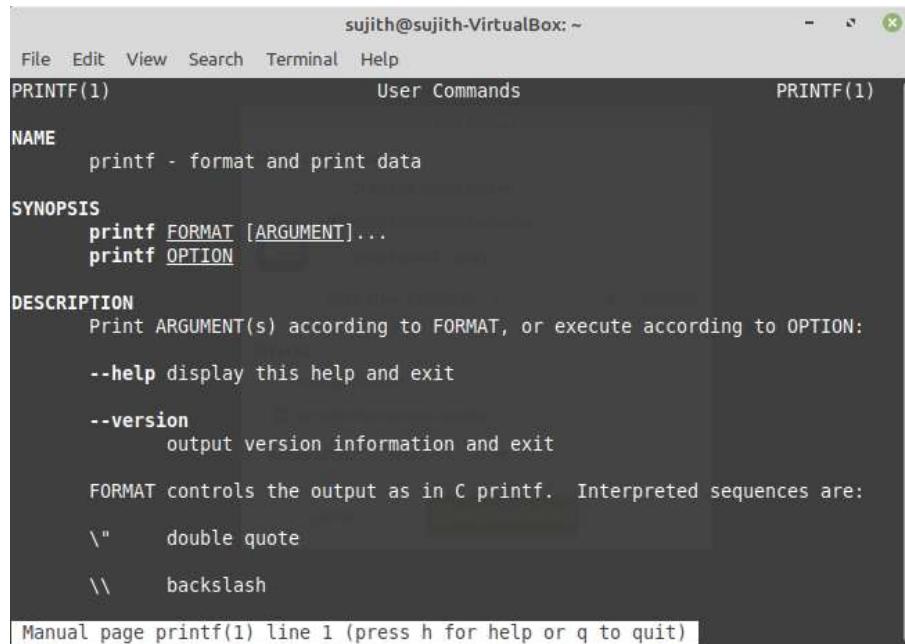


A screenshot of a terminal window titled "sujith@sujith-VirtualBox:~". The window shows the user's command history:

```
sujith@sujith-VirtualBox:~$ pwd  
/home/sujith  
sujith@sujith-VirtualBox:~$ history  
 1 pwd  
 2 history  
sujith@sujith-VirtualBox:~$
```

### 3) Man

- Shows the manual instruction of the tail command
- Man, man to start learning about man utility

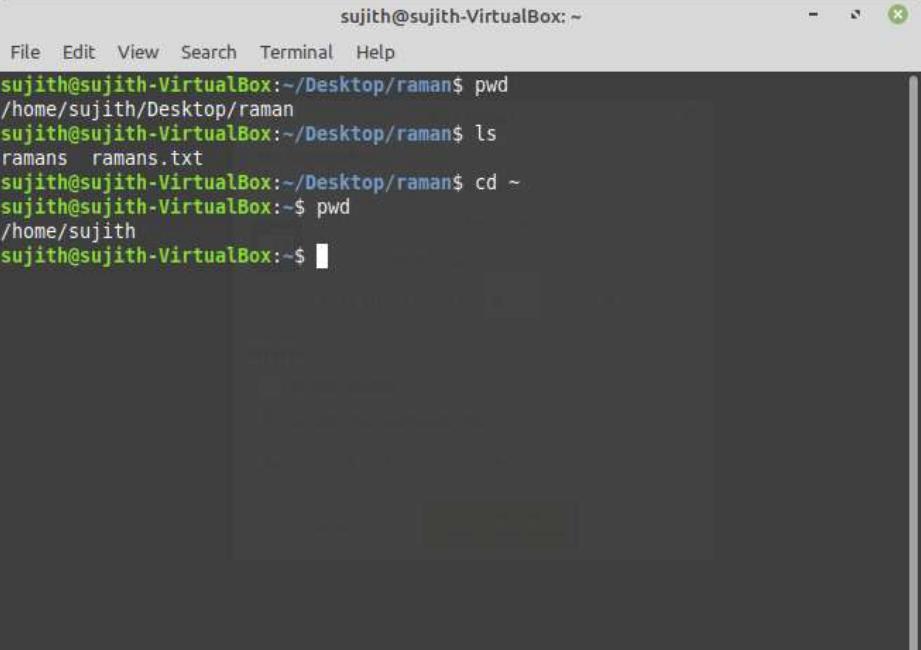


A screenshot of a terminal window titled "sujith@sujith-VirtualBox:~". The window displays the man page for the printf command:

```
PRINTF(1) User Commands PRINTF(1)  
  
NAME  
    printf - format and print data  
  
SYNOPSIS  
    printf FORMAT [ARGUMENT]...  
    printf OPTION  
  
DESCRIPTION  
    Print ARGUMENT(s) according to FORMAT, or execute according to OPTION:  
        --help display this help and exit  
        --version  
            output version information and exit  
  
    FORMAT controls the output as in C printf. Interpreted sequences are:  
        \"      double quote  
        \\      backslash  
  
Manual page printf(1) line 1 (press h for help or q to quit)
```

#### 4) cd

- To navigate through the Linux files and directories
- Cd ... (to move one directory up)
- Cd ~ (to go straight to the home folder)
- Cd - (to move to a previous directory)



The screenshot shows a terminal window with a dark background and light-colored text. At the top, it says "sujith@sujith-VirtualBox: ~/Desktop/raman\$". Below that is a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area of the terminal shows the following commands and output:  
sujith@sujith-VirtualBox:~/Desktop/raman\$ pwd  
/home/sujith/Desktop/raman  
sujith@sujith-VirtualBox:~/Desktop/raman\$ ls  
ramans ramans.txt  
sujith@sujith-VirtualBox:~/Desktop/raman\$ cd ~  
sujith@sujith-VirtualBox:~\$ pwd  
/home/sujith  
sujith@sujith-VirtualBox:~\$ █

#### 5) ls

- Used to view the content of the directory
- Ls -R (Will list all the files in the sub directory)
- Ls -a (long listing)
- Ls -al (will show hidden files)

```
sujith@sujith-VirtualBox:~/Desktop/raman$ pwd  
/home/sujith/Desktop/raman  
sujith@sujith-VirtualBox:~/Desktop/raman$ ls  
ramans ramans.txt  
sujith@sujith-VirtualBox:~/Desktop/raman$ cd ~  
sujith@sujith-VirtualBox:~$ pwd  
/home/sujith  
sujith@sujith-VirtualBox:~$
```

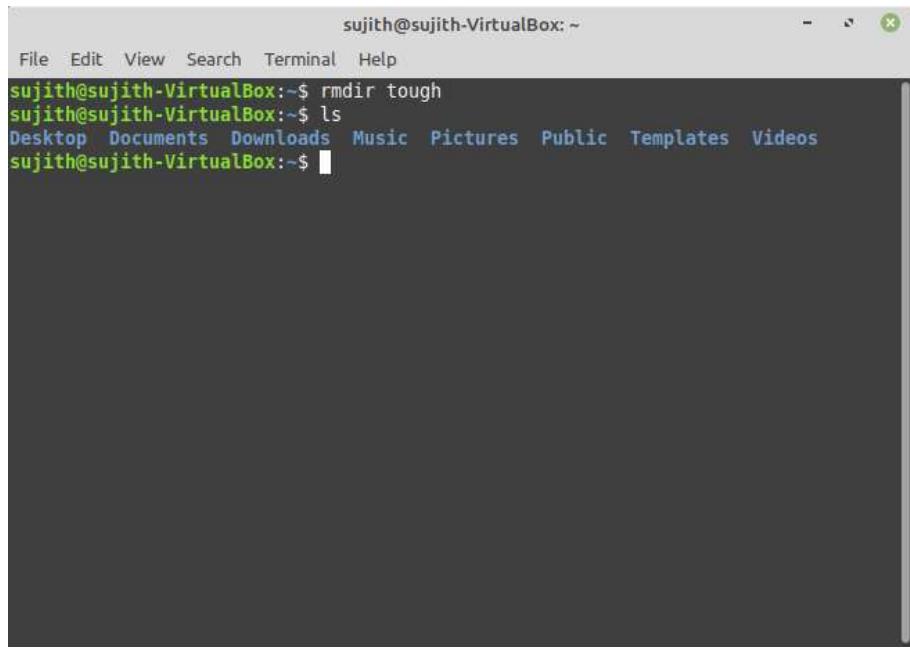
## 6) Mkdir

- To make a new directory
- Mkdir -p (to create a directory in between two existing directory)

```
sujith@sujith-VirtualBox:~$ mkdir tough  
sujith@sujith-VirtualBox:~$ ls  
Desktop Downloads Pictures Templates Videos  
Documents Music Public tough  
sujith@sujith-VirtualBox:~$
```

## 7)rmdir

→ To delete a directory (only allows you to delete empty directories)



A screenshot of a terminal window titled "sujith@sujith-VirtualBox: ~". The window has a standard Linux-style title bar with icons for minimize, maximize, and close. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal itself shows the following command sequence:

```
sujith@sujith-VirtualBox:~$ rmdir tough
sujith@sujith-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
sujith@sujith-VirtualBox:~$
```

The "rmdir tough" command was entered, followed by "ls" to list the contents of the current directory. The "tough" directory is missing from the list.

## 8)touch

→ To create a blank new file

```
sujith@sujith-VirtualBox:~$ touch thewhitedevil.txt
sujith@sujith-VirtualBox:~$ ls
Desktop  Downloads  Pictures  Templates      Videos
Documents  Music    Public       thewhitedevil.txt
sujith@sujith-VirtualBox:~$
```

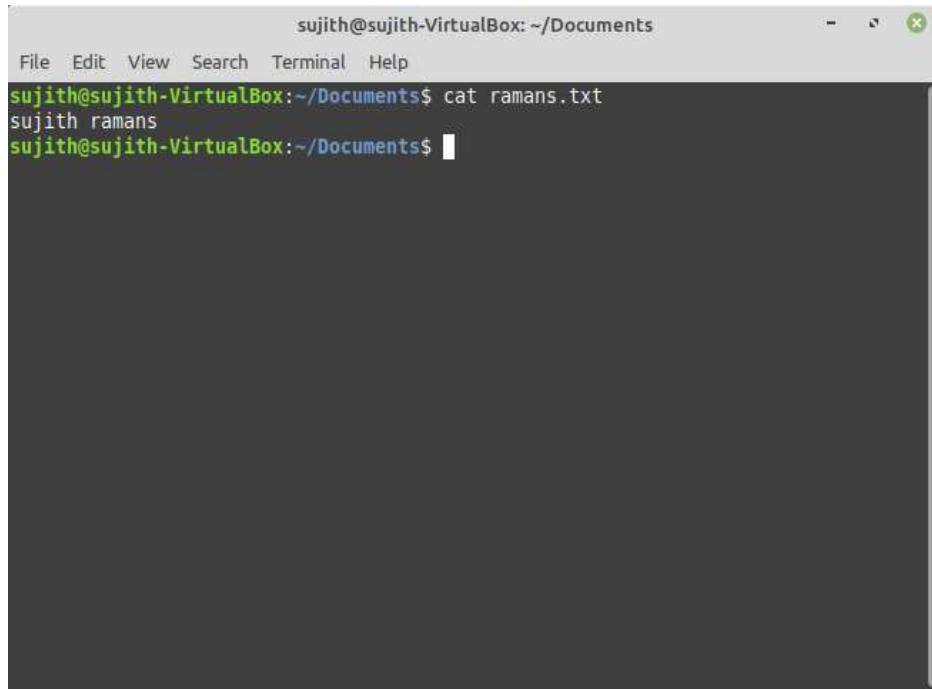
## 9)rm

- To delete directories and the contents within them
- Rm -r (to delete directory)
- Rm filename (to remove a file)

```
sujith@sujith-VirtualBox:~$ rm thewhitedevil.txt
sujith@sujith-VirtualBox:~$ ls
\Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
sujith@sujith-VirtualBox:~$
```

## 10)cat

- List the content of a file
- Cat >filename(create a new file)
- Cat filename1file name2>filename3(join two files and store the output)
- Cat filename | tr a-z A-Z



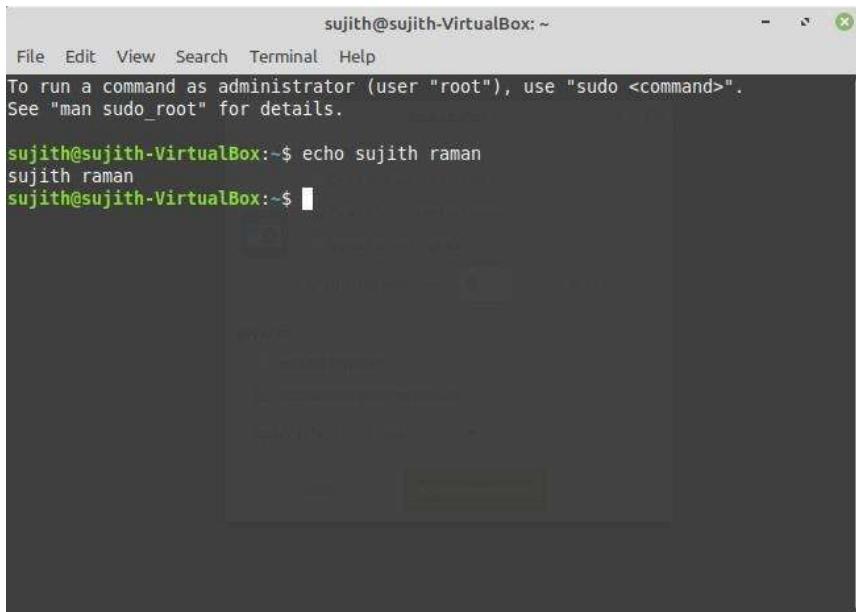
The screenshot shows a terminal window titled "sujith@sujith-VirtualBox: ~/Documents". The window has a standard Linux-style menu bar with options: File, Edit, View, Search, Terminal, Help. The main area of the terminal displays the command "cat ramans.txt" followed by its output: "sujith ramans". The terminal prompt "sujith@sujith-VirtualBox:~/Documents\$" is visible at the bottom.

```
sujith@sujith-VirtualBox:~/Documents$ cat ramans.txt
sujith ramans
sujith@sujith-VirtualBox:~/Documents$
```

## BASIC LINUX COMMANDS

### 1. echo

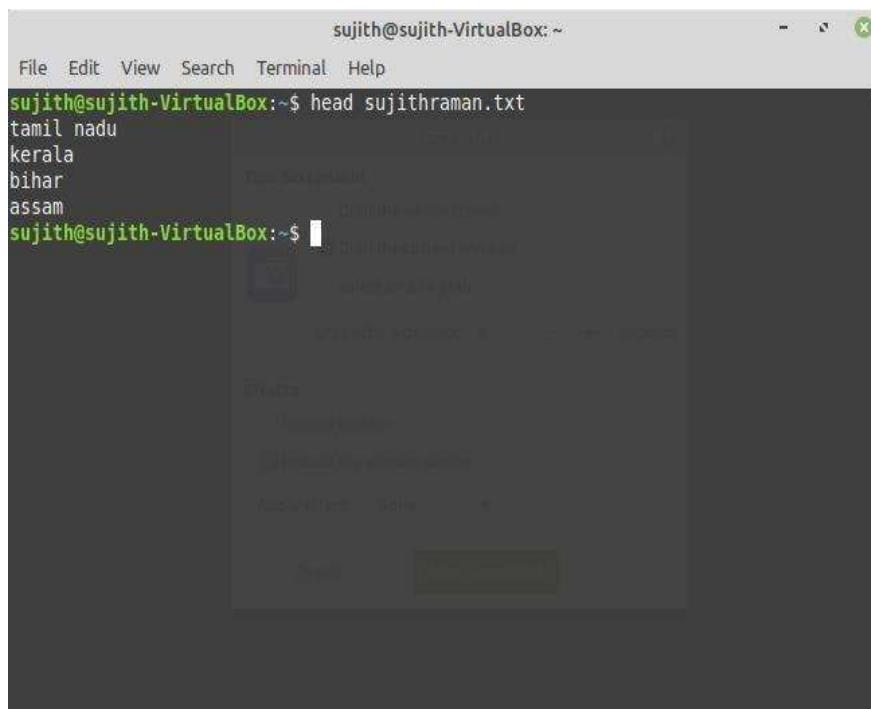
The echo command is used to move some data into a file.



A screenshot of a Linux terminal window titled "sujith@sujith-VirtualBox: ~". The window has a standard title bar with icons for minimize, maximize, and close. The terminal itself is dark-themed. At the top, there is a message from the system: "To run a command as administrator (user "root"), use "sudo <command>". See "man sudo\_root" for details." Below this, the user has entered the command "echo sujith raman" and pressed enter. The output shows the text "sujith raman" repeated twice, once for each line entered. The prompt "sujith@sujith-VirtualBox:~\$" is visible at the bottom.

### 2. head

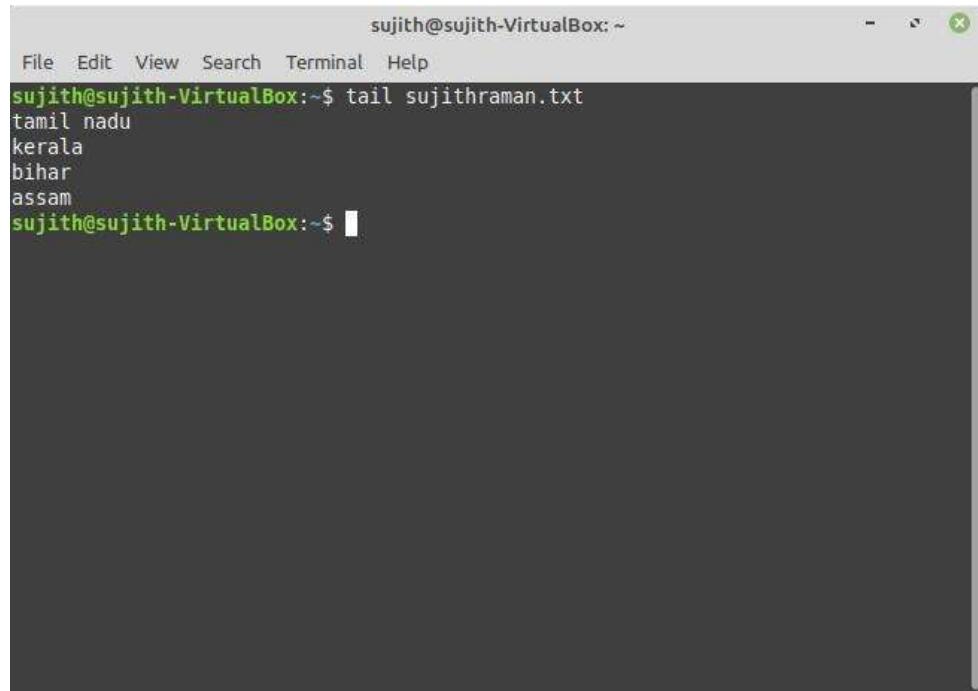
The head command is used to view the first lines of any text file. By default, it will show the first ten lines, but you can change this number to your liking.



A screenshot of a Linux terminal window titled "sujith@sujith-VirtualBox: ~". The terminal window has a light-colored background. The user has run the command "head sujithraman.txt". The output displays the first five lines of the file "sujithraman.txt", which contain the names of Indian states: "tamil nadu", "kerala", "bihar", "assam". The prompt "sujith@sujith-VirtualBox:~\$" is at the bottom.

### **3. tail**

The tail command will display the last ten lines of a text file.

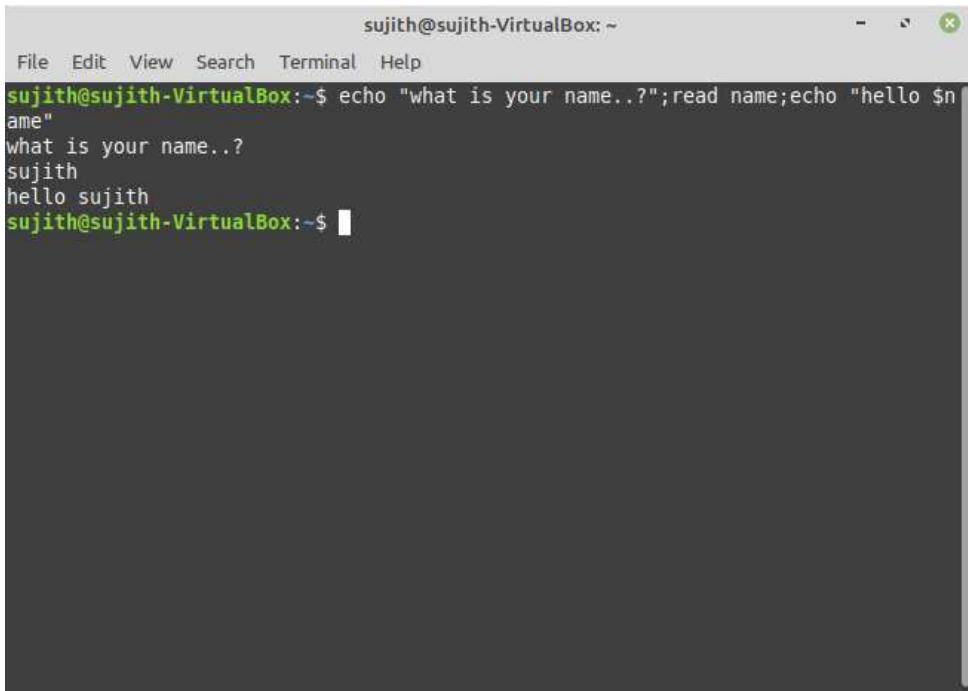


A screenshot of a terminal window titled "sujith@sujith-VirtualBox: ~". The window has a standard Linux-style title bar with icons for minimize, maximize, and close. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The command "tail sujithraman.txt" is run in the terminal, and the output shows the last four lines of the file: "tamil nadu", "kerala", "bihar", and "assam". The terminal prompt "sujith@sujith-VirtualBox:~\$" is visible at the bottom.

```
sujith@sujith-VirtualBox:~$ tail sujithraman.txt
tamil nadu
kerala
bihar
assam
sujith@sujith-VirtualBox:~$
```

#### **4. read**

The read command can be used to read the contents of a line into a variable. It can be used with and without arguments.



A screenshot of a terminal window titled "sujith@sujith-VirtualBox: ~". The window has a standard OS X-style title bar with icons for minimize, maximize, and close. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal itself shows the following command and its execution:

```
sujith@sujith-VirtualBox:~$ echo "what is your name..?";read name;echo "hello $name"
what is your name..?
sujith
hello sujith
sujith@sujith-VirtualBox:~$
```

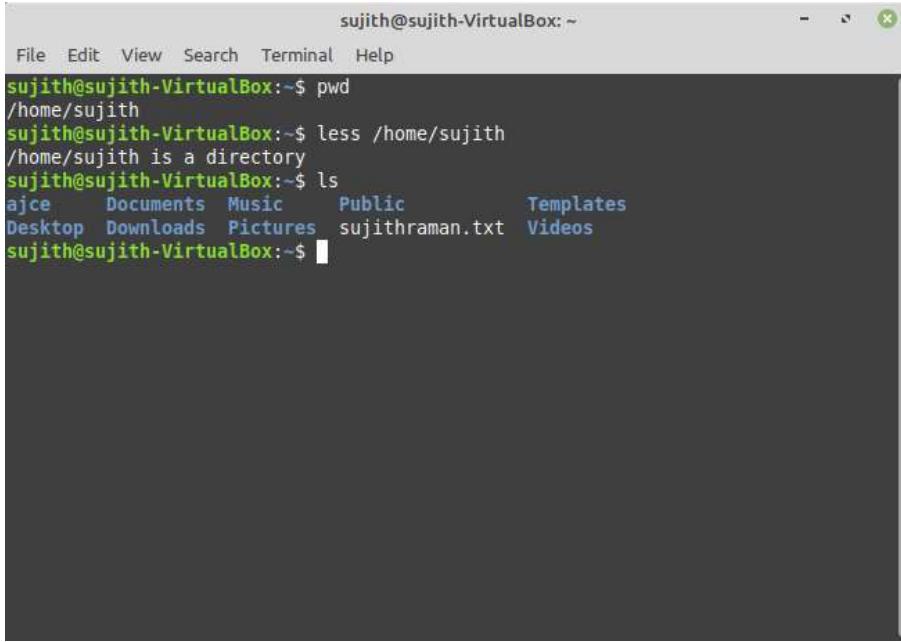
#### **5. more**

The 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. The more command also allows the user to scroll up and down through the page.

```
sujith@sujith-VirtualBox:~$ sujith@sujith-VirtualBox:~$ more -d sujithraman.txt  
tamil nadu  
kerala  
bihar  
assam  
sujith@sujith-VirtualBox:~$
```

## 6. less

Less command is linux utility which can be used to read contents of text file one page(one screen) per time.

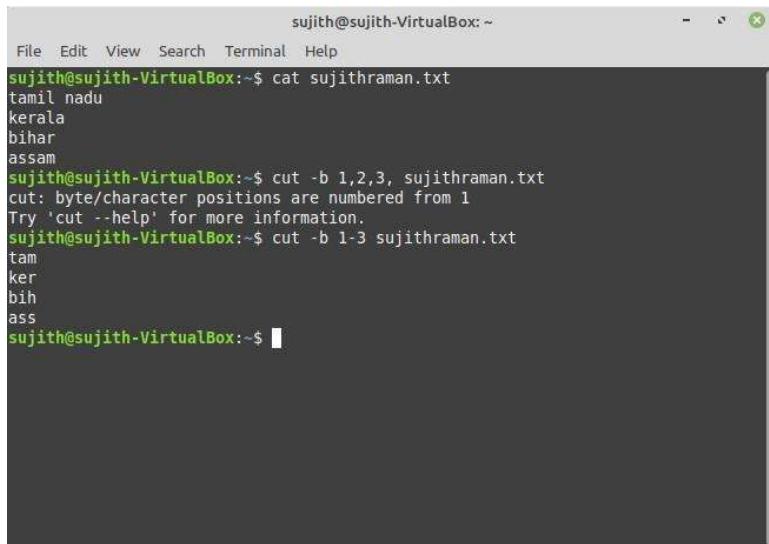


The screenshot shows a terminal window with a dark gray background and white text. At the top, there's a menu bar with options: File, Edit, View, Search, Terminal, and Help. Below the menu, the terminal prompt is 'sujith@sujith-VirtualBox:~'. The user runs the command 'pwd' to show the current working directory, which is '/home/sujith'. Then, they run 'less /home/sujith' to view the contents of that directory. The output shows that '/home/sujith' is a directory containing files like 'ajce', 'Documents', 'Music', 'Public', 'Templates', 'Desktop', 'Downloads', 'Pictures', 'sujithraman.txt', and 'Videos'. The terminal window has a green title bar and a small red close button in the top right corner.

```
sujith@sujith-VirtualBox:~$ pwd
/home/sujith
sujith@sujith-VirtualBox:~$ less /home/sujith
/home/sujith is a directory
sujith@sujith-VirtualBox:~$ ls
ajce    Documents  Music      Public      Templates
Desktop  Downloads Pictures  sujithraman.txt  Videos
sujith@sujith-VirtualBox:~$
```

## 7. cut

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

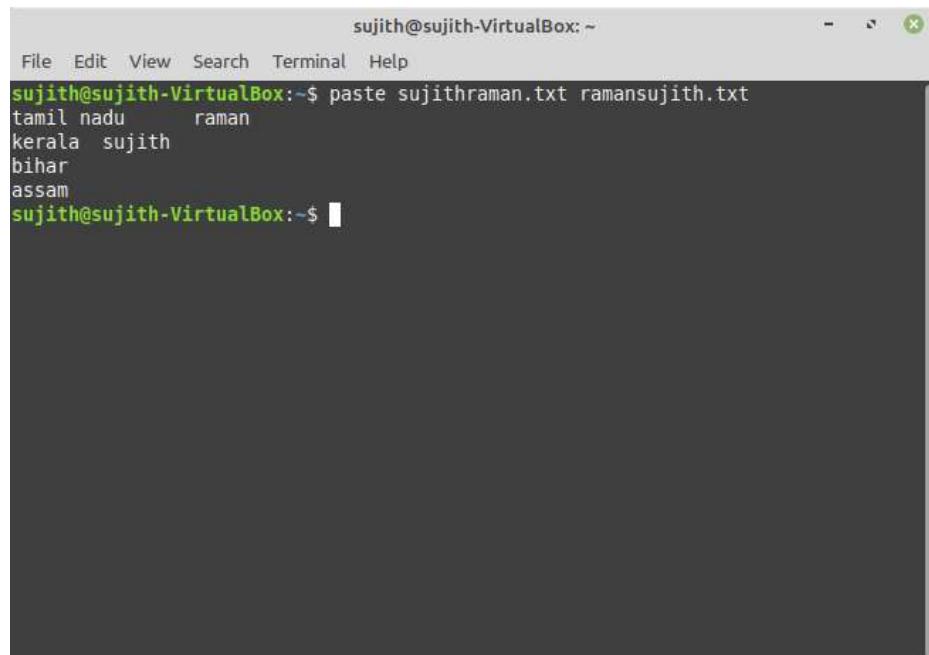


The screenshot shows a terminal window with a dark gray background and white text. At the top, there's a menu bar with options: File, Edit, View, Search, Terminal, and Help. Below the menu, the terminal prompt is 'sujith@sujith-VirtualBox:~'. The user runs 'cat sujithraman.txt' to view the contents of the file, which contains the lines 'tamil nadu', 'kerala', 'bihar', and 'assam'. Then, they run 'cut -b 1,2,3, sujithraman.txt'. The output shows the first three characters of each word: 'tam', 'ker', 'bih', and 'ass'. The terminal window has a green title bar and a small red close button in the top right corner.

```
sujith@sujith-VirtualBox:~$ cat sujithraman.txt
tamil nadu
kerala
bihar
assam
sujith@sujith-VirtualBox:~$ cut -b 1,2,3, sujithraman.txt
cut: byte/character positions are numbered from 1
Try 'cut --help' for more information.
sujith@sujith-VirtualBox:~$ cut -b 1-3 sujithraman.txt
tam
ker
bih
ass
sujith@sujith-VirtualBox:~$
```

## 8. paste

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

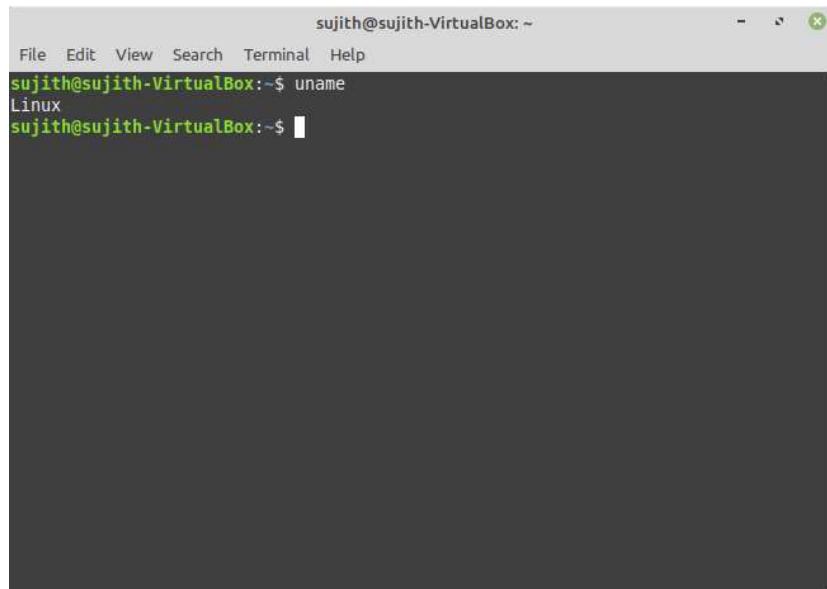


A screenshot of a terminal window titled "sujith@suji...". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area shows the command "sujith@suji...:~\$ paste sujithraman.txt ramansujith.txt" followed by its output:

```
sujith@suji...:~$ paste sujithraman.txt ramansujith.txt
tamil nadu      raman
kerala   sujith
bihar
assam
sujith@suji...:~$
```

## 9. uname

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



A screenshot of a terminal window titled "sujith@sujith-VirtualBox: ~". The window has a standard title bar with icons for minimize, maximize, and close. Below the title bar is a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The main area of the terminal shows the command "uname" being run, followed by the output "Linux". The prompt "sujith@sujith-VirtualBox:~\$ " is visible at the bottom right of the terminal window.

```
sujith@sujith-VirtualBox: ~
File Edit View Search Terminal Help
sujith@sujith-VirtualBox:~$ uname
Linux
sujith@sujith-VirtualBox:~$
```

⌚ **groupadd :**

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

```
(raman㉿kali)-[~]
$ groupadd usrgrp
groupadd: group 'usrgrp' already exists

(raman㉿kali)-[~]
$ groups
raman cdrom floppy sudo audio dip video plugdev netdev bluetooth scanner kaboxer

(raman㉿kali)-[~]
$ groups raman
raman : raman cdrom floppy sudo audio dip video plugdev netdev bluetooth scanner kaboxer

(raman㉿kali)-[~]
```

⌚ **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.

```
(raman㉿kali)-[~]
$ sudo groupdel sujith

(raman㉿kali)-[~]
$ cat /etc/group
zsh: no such file or directory: cat /etc/group

(raman㉿kali)-[~]
$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:
tty:x:5:
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:
```

## ⌚ **usermod:**

usermod command is used to change the properties of a user in Linux through the commandline

- ✚ command-line utility that allows you to modify a user's login information
- ✚ #usermod --help
- ✚ #usermod -u 2000 Tom

```
(raman㉿kali)-[~]
$ sudo usermod -c "hello" raman
zsh: command not found: sudoo

(raman㉿kali)-[~]
$ sudo usermod -c "hello" raman

(raman㉿kali)-[~]
$ cat /etc/passwd
root:x:0:0:root:/root:/usr/bin/zsh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
```

## ⌚ **groups:**

- ✚ print the groups a user is in
- ✚ #groups alice

```
(raman㉿kali)-[~]
$ groups
raman cdrom floppy sudo audio dip video plugdev netdev bluetooth scanner ka
boxer

(raman㉿kali)-[~]
$
```

## ⌚ **groupmod:**

- ✚ The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group database.
- ✚ # groupmod -n group1 group2

```
(raman㉿kali)-[~]
└─$ groupmod -n newusergrp usrgrp
groupmod: Permission denied.
groupmod: cannot lock /etc/group; try again later.

(raman㉿kali)-[~]
└─$ sudo groupmod -n newusergrp usrgrp

(raman㉿kali)-[~]
└─$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:
tty:x:5:
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:
```

### ⑤ **chmod:**

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

#chmod whowhatwhich file/directory

- + **chmod +rwx filename** // To add permissions.

- + **chmod -rwx directoryname** // To remove permissions.

- + **chmod +x filename** //To allow executable permissions.

- + **chmod -wx filename** // to take out write and executable permissions.

#chmod u+x test

#chmod g-rwx test

#chmod o-r test

```
[~] (raman㉿kali)-[~]
$ sudo chmod g+rw myfile.txt
[sudo] password for raman:

[~] (raman㉿kali)-[~]
$ chmod g+rw myfile.txt

[~] (raman㉿kali)-[~]
$ chmod +rwx myfile.txt

[~] (raman㉿kali)-[~]
$ ls -l myfile.txt
-rwxrwxr-x 1 raman raman 0 Aug 13 19:51 myfile.txt

[~] (raman㉿kali)-[~]
$ sudo chmod g+rw myfile.txt

[~] (raman㉿kali)-[~]
$ chmod g+rw myfile.txt

[~] (raman㉿kali)-[~]
$ ls -l myfile.txt
-rwxrwxr-x 1 raman raman 0 Aug 13 19:51 myfile.txt

[~] (raman㉿kali)-[~]
$
```

### ⌚ ps:

- + The ps command, **short for Process Status**, is a command line utility that is used to display or view information related to the processes running in a Linux system.
- + PID – This is the unique process ID
- + TTY – This is the type of terminal that the user is logged in to
- + TIME – This is the time in minutes and seconds that the process has been running
- + CMD – The command that launched the process #ps -a

```
[~] (raman㉿kali)-[~]
$ ps
    PID TTY          TIME CMD
  1045 pts/0    00:00:04 zsh
  1589 pts/0    00:00:00 ps

[~] (raman㉿kali)-[~]
$
```

### ⌚ chown:

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

- + #chown Tom Test

```
└$ sudo chown raman myfile.txt
[sudo] password for raman:

[raman@kali)~]
$ chown raman myfile.txt

[raman@kali)~]
$ ls -l myfile.txt
-rwxrwxr-x 1 raman raman 0 Aug 13 19:51 myfile.txt

[raman@kali)~]
$
```

⌚ **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. List out all the groups a user belongs to. Display security context of the current user

```
[raman@kali)~]
$ id
uid=1000(raman) gid=1000(raman) groups=1000(raman),24(cdrom),25(floppy),27(sudo),29(audio),30(dip),44(video),46(plugdev),109(netdev),118(bluetooth),133(scanner),142(kaboxer)
```

⌚ **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 - 19:49:03 up 16 min, 1 user, load average: 0.12, 0.17, 0.18
Tasks: 140 total, 1 running, 139 sleeping, 0 stopped, 0 zombie
%Cpu(s): 1.1 us, 3.0 sy, 0.0 ni, 93.9 id, 1.1 wa, 0.0 hi, 0.8 si, 0.
MiB Mem : 1990.1 total, 1173.4 free, 405.2 used, 411.5 buff/cache
MiB Swap: 975.0 total, 975.0 free, 0.0 used. 1432.2 avail Mem

```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
475	root	20	0	277996	79320	38420	S	5.0	3.9	0:21.20
1650	raman	20	0	330808	40576	32512	S	2.7	2.0	0:00.33
833	raman	20	0	388940	83764	59880	S	1.3	4.1	0:07.47
786	raman	20	0	156908	2860	2408	S	0.3	0.1	0:03.91
851	raman	20	0	235108	21276	14732	S	0.3	1.0	0:00.49
896	raman	20	0	514652	40928	31364	S	0.3	2.0	0:00.94
967	raman	20	0	404188	42100	34252	S	0.3	2.1	0:00.36
995	raman	20	0	403632	85232	68040	S	0.3	4.2	0:03.03
1	root	20	0	102528	11352	8572	S	0.0	0.6	0:05.22
2	root	20	0	0	0	0	S	0.0	0.0	0:00.00
3	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
8	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
9	root	20	0	0	0	0	S	0.0	0.0	0:00.37
10	root	20	0	0	0	0	I	0.0	0.0	0:00.37
11	root	rt	0	0	0	0	S	0.0	0.0	0:00.02
12	root	20	0	0	0	0	I	0.0	0.0	0:00.60
13	root	20	0	0	0	0	S	0.0	0.0	0:00.00
15	root	20	0	0	0	0	S	0.0	0.0	0:00.00

## ⌚ wc:

wc stands for word count.

✚ Used for counting purpose.

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

✚ #wc state.txt 6 8 54 state.txt

✚ #wc state.txt capital.txt

✚ wc -l state.txt

✚ wc -w state.txt capital.txt

✚ wc -c state.txt

✚ wc -m state.txt

```
(raman@kali)-[~]
$ cat myfile.txt
hello everyone
hope u all safe
stay home stay safe

(raman@kali)-[~]
$ cat myfile2.txt
hai hello

(raman@kali)-[~]
$ wc myfile.txt
3 10 52 myfile.txt

(raman@kali)-[~]
$ wc myfile2.txt
1 2 10 myfile2.txt

(raman@kali)-[~]
$ wc -l myfile.txt
3 myfile.txt

(raman@kali)-[~]
$ wc -w myfile.txt myfile2.txt
10 myfile.txt
2 myfile2.txt
12 total
```

## ⌚ Tar:

- The Linux ‘tar’stands for tape archive, is used to create Archive and extract the Archive files
- Linux tar command to create compressed or uncompressed Archive files
- Options:

✚ -c : Creates Archive

✚ -x : Extract the archive

✚ -f : creates archive with given filename

✚ -t: displays or lists files in archived file

✚ -u: archives and adds to an existing archive file

✚ -v: Displays Verbose Information

✚ -A : Concatenates the archive files

✚ -z : zip, tells tar command that creates tar file using gzip

- ⊕ -j : filter archive tar file using tbzip
- ⊕ -W : Verify a archive file
- ⊕ -r : update or add file or directory in already existed .tar file

```
#tar cf archive.tar state.txt capital.txt //create archive file
#ls archive.tar
#tar tf /archive.tar // list contents of tar archive file
⊕ Extract an archive created with tar
#mkdir backup
#cd backup
#tar xf/home/meera/Documents/Meera_Linux/archive.tar
```

#### ➤ **Compression Types**

```
gzip(z),bzip2(j), xz(J) #tar czf /abc.tar.gz /etc
#tar cjf /abcd.tar.bz2 /etc
#tar cJf /abcde.tar.xz /etc
```

#### ➤ **Extract an archive**

```
#mkdir backup1
#cd backup1
#tar xzf /abc.tar.gz
#mkdir backup2
#cd backup2
#tar xjf /abcd.tar.bz2
#mkdir backup3
#cd backup3
#tar xJf /abcde.tar.xz
```

#### ⊕ Bzip2



A terminal window showing a file listing. The user is in their home directory (~). They run the command 'ls' to list files. The output shows several files: Desktop, Downloads, F3.txt.xz, myfile2.txt, Pictures, Templates, Documents, F3.txt.gz, Music, myfile.txt, Public, and Videos. The file F3.txt.xz is highlighted in red, while the others are in green. Below the terminal prompt, there is a small icon of a person sitting at a desk.

```
(raman㉿kali)-[~]
$ ls
Desktop  Downloads  F3.txt.xz  myfile2.txt  Pictures  Templates
Documents  F3.txt.gz  Music      myfile.txt  Public    Videos

(raman㉿kali)-[~]
$
```

#### ⊕ gzip

```
(raman㉿kali)-[~]
$ ls
Desktop      f1.txt  f3.txt.gz  Music       Pictures   Videos
Documents    f2.txt  f3.txt.xz  myfile2.txt  Public
Downloads    f3.txt  f4.txt    myfile.txt   Templates

(raman㉿kali)-[~]
$ gzip f1.txt f2.txt

(raman㉿kali)-[~]
$ ls
Desktop      f1.txt.gz  f3.txt.gz  Music       Pictures   Videos
Documents    f2.txt.gz  f3.txt.xz  myfile2.txt  Public
Downloads    f3.txt      f4.txt    myfile.txt   Templates

(raman㉿kali)-[~]
$ gzip -c f1.txt > f2.txt
gzip: f1.txt: No such file or directory

(raman㉿kali)-[~]
$ gzip -c f1.txt.gz
Laf1.txt.gz@#?@#?@#iKd`N3@+@(a`f@,\

(raman㉿kali)-[~]
$ gzip -d f2.txt.gz
gzip: f2.txt already exists: do you wish to overwrite (y or n)? y
```

+ xz

```
(raman㉿kali)-[~]
$ ls
Desktop      f1.txt.gz   f3.txt.gz   Music       Pictures    Videos
Documents    f2.txt      f3.txt.xz  myfile2.txt  Public
Downloads    f3.txt      f4.txt      myfile.txt   Templates

(raman㉿kali)-[~]
$ xz f2.txt

(raman㉿kali)-[~]
$ xz -k f3.txt
xz: f3.txt.xz: File exists

(raman㉿kali)-[~]
$ xz -k f4.txt

(raman㉿kali)-[~]
$ xz -c f3.txt > f3.txt.gz

(raman㉿kali)-[~]
$ ls
Desktop      f1.txt.gz   f3.txt.gz   f4.txt.xz   myfile.txt   Templates
Documents    F2.txt.xz  f3.txt.xz  Music       Pictures    Videos
Downloads    f3.txt      f4.txt      myfile2.txt  Public
```

expr

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

- + Basic operations like addition, subtraction, multiplication, division, and modulus on integers.
- + Evaluating regular expressions, string operations like substring, length of strings etc.
- + Performing operations on variables inside a shell script

```
#expr 10 + 2
```

```
(raman@kali)-[~]
$ expr 12 + 10
22

(raman@kali)-[~]
$ expr 12 / 10
1

(raman@kali)-[~]
$ expr 12 - 10
2

(raman@kali)-[~]
$ sudo chmod g+rw myfile.txt
```

## ⌚ Redirections & Piping :

- + A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.
- + Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

```
#ls -l | wc -l
```

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

```
(raman@kali)-[~]
$ cat /etc/myfile.txt|head -55| tail -3
cat: /etc: Is a directory
hello everyone
hope u all safe
stay home stay safe

(raman@kali)-[~]
$
```

## ⌚ ssh

- + ssh stands for “Secure Shell”.
- + It is a protocol used to securely connect to a remote server/system.
- + ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.
- + It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

```
#ssh user_name@host(IP/Domain_name)
```

```
#ssh -X root@server1.example.com
```

(raman㉿kali)-[~]\$ ssh --help  
unknown option -- -  
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]

(raman㉿kali)-[~]\$ 255 ✘

## ⑤ scp

- ✚ SCP (secure copy) is a command-line utility that allows you to securely copy files and directories between two locations.
- ✚ With scp, you can copy a file or directory:
- ✚ From your local system to a remote system.
- ✚ From a remote system to your local system.
- ✚ Between two remote systems from your local system.
- ✚ Remote file system locations are specified in format [user@]host:/path

✚ [user@]host:/path Syntax:

```
scp [OPTION] [user@]SRC_HOST:]file1 [user@]DEST_HOST:]file2  
$scp/etc/yum.config/etc/hosts ServerX:/home/student  
$scp ServerX:/etc/hostname /home/student
```

(raman㉿kali)-[~]\$ ssh raman@kali  
sh: Could not resolve hostname raman\343\211\277kali: Name or service not known

## ⑥ ssh-keygen

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.

```
$ssh-keygen -t rsa
```

```
└──(raman㉿kali)-[~]
└─$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/raman/.ssh/id_rsa): rsa
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in rsa
Your public key has been saved in rsa.pub
The key fingerprint is:
SHA256:JFwFlREeQSaj1hRlkLvcsmrw1Tkw13JKttZ/knRskDk raman㉿kali
The key's randomart image is:
+--- [RSA 3072] ---+
| OX%=
| ..*..
| = o ...
| . o+ = o E
| .SX B +
| . = 0 . . +
| o . + . o +
| o . + .
| ...
| o
+--- [SHA256] ---+
└──(raman㉿kali)-[~]
└─$ ssh-keygen
```

## ⑤ ssh-copy-id

- ⊕ The ssh-copy-id command allows you to install an SSH key on a remote server's authorized keys.
- ⊕ This command facilitates SSH key login, which removes the need for a password for each login, thus ensuring a password-less, automatic login process.
- ⊕ \$ssh-copy-id username@remote\_host

Create six files with name of the form songX.mp3

```
(raman@kali)-[~]
└─$ touch song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3 song7.mp3
```

Create six files with name of the form pic.mp3

```
(raman@kali)-[~]
└─$ touch pic1.jpg pic2.jpg pic3.jpg pic4.jpg pic5.jpg pic6.jpg pic7.jpg
```

Create six files with name of the form filmX.mp3

```
(raman@kali)-[~]
└─$ touch mov1.mp4 mov2.mp4 mov3.mp4 mov4.mp4 mov5.mp4 mov6.mp4 mov7.mp4
```

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.

```
(raman@kali)-[~]
└─$ mv *.mp3 ./Music/
(raman@kali)-[~]
└─$ mv *.jpg ./Pictures/
mv: target './Pictures/' is not a directory
(raman@kali)-[~]
└─$ mv *.jpg ./Pictures/
(raman@kali)-[~]
```

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

```
(raman@kali)-[~]
└─$ mkdir -p {friends,family,work}
```

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

```
(raman@kali)-[~/friends]
└─$ cp /home/raman/Music pic1.jpg pic2.jpg pic3.jpg pic4.jpg pic5.jpg pic6.jpg pic7.jpg /home/raman/family/
```

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

```
(raman@kali)-[~]
└─$ rmdir {friends,family}
```

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

```
(raman@kali)-[~]
└─$ rm -r {friends,family}
```

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

```
(raman㉿kali)-[~]
$ ls -a > allfiles.txt
```

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

```
(raman㉿kali)-[~]
$ date
Tuesday 17 August 2021 08:13:43 PM IST
```

Add the user vaishak

```
(raman㉿kali)-[~]
$ sudo useradd vaishak
[sudo] password for raman:
```

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

```
(raman㉿kali)-[~]
$ cat /etc/passwd | grep vaishak
vaishak:x:1001:1002::/home/vaishak:/bin/sh
```

Use the passwd command to initialize vaishak password

```
(raman㉿kali)-[~]
$ sudo passwd vaishak
[sudo] password for raman:
New password:
Retype new password:
passwd: password updated successfully
```

Create a supplementary group called johny with a group id of 30000

```
(raman㉿kali)-[~]
$ sudo groupadd -g 30000 johny
```

Create a supplementary group called artists

```
(raman㉿kali)-[~]
$ sudo groupadd singer
```

Confirm that johny and singer have been added by examining the /etc/group file.

```
(raman㉿kali)-[~]
$ id vaishak
uid=1001(vaishak) gid=1002(vaishak) groups=1002(vaishak),30000(johny)
```

Add arun and babu to the johny group.

```
[~] (raman㉿ kali) ~
$ sudo useradd arun
[~] (raman㉿ kali) ~
$ sudo useradd kannan
[~] (raman㉿ kali) ~
$ sudo useradd babu
```

Add kannan, Dolly and elvis to the singer group

```
[~] (raman㉿ kali) ~
$ sudo useradd dolly
[~] (raman㉿ kali) ~
$ sudo useradd elvis
[~] (raman㉿ kali) ~
$ sudo useradd elvis
```

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

```
debian-snmp:x:127:
sslh:x:128:
nm-openvpn:x:129:
nm-openconnect:x:130:
pulse:x:131:
pulse-access:x:132:
scanner:x:133:saned,raman
saned:x:134:
sambashare:x:135:
inetsim:x:136:
colord:x:137:
geoclue:x:138:
lightdm:x:139:
kpadmins:x:140:
raman:x:1000:
vboxsf:x:141:
kaboxer:x:142:raman,root
systemd-coredump:x:999:
newusergrp:x:1001:
vaishak:x:1002:
johny:x:30000:vaishak
singer:x:30001:
sujith:x:30002:
arun:x:1003:
kannan:x:1004:
babu:x:1005:
```

Attempt to remove user Dolly.

```
[~] (raman㉿ kali) ~
$ sudo userdel Dolly
```

## IPCONFIG

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19044.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DELL>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

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

Ethernet adapter Ethernet 3:

    Connection-specific DNS Suffix . :
    Link-local IPv6 Address . . . . . : fe80::d13d:2d53:6ab3:9379%22
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 3:

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

Wireless LAN adapter Local Area Connection* 4:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . :
    Link-local IPv6 Address . . . . . : fe80::dd2e:2348:9299:3d9f%21
    IPv4 Address. . . . . : 192.168.1.101
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::b6cd:27ff:fee7:5825%21
                                         192.168.1.1

C:\Users\DELL>
```

## NETSTAT

```
C:\WINDOWS\system32\cmd.exe - netstat
```

```
C:\Users\DELL>netstat
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:1548	SUJITH:5354	ESTABLISHED
TCP	127.0.0.1:5354	SUJITH:1548	ESTABLISHED
TCP	192.168.1.101:1432	bom07s16-in-f3:https	ESTABLISHED
TCP	192.168.1.101:4563	bom12s21-in-f10:https	TIME_WAIT
TCP	192.168.1.101:4741	bom07s16-in-f3:https	ESTABLISHED
TCP	192.168.1.101:4742	a-0001:https	ESTABLISHED
TCP	192.168.1.101:4743	40.100.137.50:https	ESTABLISHED
TCP	192.168.1.101:4744	20.190.146.32:https	ESTABLISHED
TCP	192.168.1.101:4745	13.107.246.58:https	ESTABLISHED
TCP	192.168.1.101:4746	13.107.12.254:https	ESTABLISHED
TCP	192.168.1.101:4747	13.107.3.254:https	ESTABLISHED
TCP	192.168.1.101:4748	204.79.197.222:https	ESTABLISHED

NETSTAT -A

```
C:\WINDOWS\system32\cmd.exe - netstat -a  
C:\Users\DELL>netstat -a  
  
Active Connections  
  
Proto Local Address Foreign Address State  
TCP 0.0.0.0:135 SUJITH:0 LISTENING  
TCP 0.0.0.0:445 SUJITH:0 LISTENING  
TCP 0.0.0.0:1536 SUJITH:0 LISTENING  
TCP 0.0.0.0:1537 SUJITH:0 LISTENING  
TCP 0.0.0.0:1538 SUJITH:0 LISTENING  
TCP 0.0.0.0:1539 SUJITH:0 LISTENING  
TCP 0.0.0.0:1540 SUJITH:0 LISTENING  
TCP 0.0.0.0:1542 SUJITH:0 LISTENING  
TCP 0.0.0.0:5040 SUJITH:0 LISTENING  
TCP 0.0.0.0:5357 SUJITH:0 LISTENING  
TCP 0.0.0.0:7070 SUJITH:0 LISTENING  
TCP 0.0.0.0:7680 SUJITH:0 LISTENING  
TCP 127.0.0.1:1548 SUJITH:5354 ESTABLISHED  
TCP 127.0.0.1:5354 SUJITH:0 LISTENING  
TCP 127.0.0.1:5354 SUJITH:1548 ESTABLISHED  
TCP 127.0.0.1:5939 SUJITH:0 LISTENING  
TCP 192.168.1.101:139 SUJITH:0 LISTENING  
TCP 192.168.1.101:1432 bom07s16-in-f3:https ESTABLISHED  
TCP 192.168.1.101:2113 fna-whatsapp-shv-04-fmaa1:https ESTABLISHED  
TCP 192.168.1.101:3741 bom12s09-in-f1:https ESTABLISHED  
TCP 192.168.1.101:3742 40.100.137.50:https ESTABLISHED  
TCP 192.168.1.101:3743 13.107.12.254:https ESTABLISHED  
TCP 192.168.1.101:3744 13.107.246.58:https ESTABLISHED  
TCP 192.168.1.101:3745 13.107.246.254:https ESTABLISHED  
TCP 192.168.1.101:3746 204.79.197.222:https ESTABLISHED  
TCP 192.168.1.101:4742 a-0001:https ESTABLISHED  
TCP 192.168.1.101:4743 40.100.137.50:https TIME_WAIT  
TCP 192.168.1.101:4744 20.190.146.32:https TIME_WAIT
```

IFCONFIG LINUX

```
(raman㉿kali)-[~]
└─$ ifconfig
eth0: 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::a00:27ff:fe24:c7a4 prefixlen 64 scopeid 0x20<link>
            ether 08:00:27:24:c7:a4 txqueuelen 1000 (Ethernet)
              RX packets 4 bytes 930 (930.0 B)
              RX errors 0 dropped 0 overruns 0 frame 0
              TX packets 14 bytes 1332 (1.3 KiB)
              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 12 bytes 556 (556.0 B)
              RX errors 0 dropped 0 overruns 0 frame 0
              TX packets 12 bytes 556 (556.0 B)
              TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

#### IFCONFIG -A

```
(raman㉿kali)-[~]
└─$ ifconfig -a
eth0: 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::a00:27ff:fe24:c7a4 prefixlen 64 scopeid 0x20<link>
            ether 08:00:27:24:c7:a4 txqueuelen 1000 (Ethernet)
              RX packets 9 bytes 1566 (1.5 KiB)
              RX errors 0 dropped 0 overruns 0 frame 0
              TX packets 22 bytes 1944 (1.8 KiB)
              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 12 bytes 556 (556.0 B)
              RX errors 0 dropped 0 overruns 0 frame 0
              TX packets 12 bytes 556 (556.0 B)
              TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

#### IFCONGFIG -S

```
(raman㉿kali)-[~]
└─$ ifconfig -s
Iface      MTU     RX-OK RX-ERR RX-DRP RX-OVR     TX-OK TX-ERR TX-DRP TX-OVR Flg
eth0      1500        9     0     0 0        22     0     0     0  BMRU
lo       65536       12     0     0 0        12     0     0     0  LRU
```

## IFCONFIG -V

```
(raman㉿kali)-[~]
$ ifconfig -v
eth0: 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::a00:27ff:fe24:c7a4 prefixlen 64 scopeid 0x20<link>
            ether 08:00:27:24:c7:a4 txqueuelen 1000 (Ethernet)
                RX packets 9 bytes 1566 (1.5 KiB)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 22 bytes 1944 (1.8 KiB)
                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 12 bytes 556 (556.0 B)
                RX errors 0 dropped 0 overruns 0 frame 0
                TX packets 12 bytes 556 (556.0 B)
                TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

## IFCONFIG --HELP

```
(raman㉿kali)-[~]
$ ifconfig --help
Usage:
  ifconfig [-a] [-v] [-s] <interface> [[<AF>] <address>]
  [add <address>[/<prefixlen>]]
  [del <address>[/<prefixlen>]]
  [[-]broadcast [<address>]] [[-]pointtopoint [<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) csip6 (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)-HDL) 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
List of possible address families:
  unix (UNIX Domain) inet (DARPA Internet) inet6 (IPv6)
  ax25 (AMPR AX.25) netrom (AMPR NET/ROM) rose (AMPR ROSE)
  ipx (Novell IPX) ddp (Appletalk DDP) ec (Econet)
  ash (Ash) x25 (CCITT X.25)
```

## NETSTAT LINUX

```
(raman㉿kali)-[~]
└─$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
udp      0      0 10.0.2.15:bootpc       10.0.2.2:bootps      ESTABLISHED
raw6     0      0 [::]:ipv6-icmp        [::]:*                  7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags     Type      State         I-Node  Path
unix  2      [ ]    DGRAM          LISTENING   19354  /run/user/1000/systemd/notify
unix  2      [ ACC ]   STREAM          LISTENING   17232  @/tmp/.X11-unix/X0
unix  2      [ ACC ]   STREAM          LISTENING   19357  /run/user/1000/systemd/private
unix  2      [ ACC ]   STREAM          LISTENING   19365  /run/user/1000/bus
unix  2      [ ACC ]   STREAM          LISTENING   19366  /run/user/1000/gnupg/S.dirmngr
unix  2      [ ACC ]   STREAM          LISTENING   19367  /run/user/1000/gnupg/S.gpg-agent.browser
unix  2      [ ACC ]   STREAM          LISTENING   19368  /run/user/1000/gnupg/S.gpg-agent.extra
unix  2      [ ACC ]   STREAM          LISTENING   19369  /run/user/1000/gnupg/S.gpg-agent.ssh
unix  2      [ ACC ]   STREAM          LISTENING   19370  /run/user/1000/gnupg/S.gpg-agent
unix  2      [ ACC ]   STREAM          LISTENING   19371  /run/user/1000/pulse/native
unix  2      [ ACC ]   STREAM          LISTENING   19826  @/tmp/.ICE-unix/743
unix  3      [ ]    DGRAM          LISTENING   12009  /run/systemd/notify
unix  2      [ ACC ]   STREAM          LISTENING   12012  /run/systemd/private
unix  2      [ ACC ]   STREAM          LISTENING   12014  /run/systemd/userdb/io.systemd.DynamicUs
unix  2      [ ]    DGRAM          LISTENING   12025  /run/systemd/journal/syslog
unix  2      [ ACC ]   STREAM          LISTENING   12027  /run/systemd/fsck.progress
unix 12     [ ]    DGRAM          LISTENING   12031  /run/systemd/journal/dev-log
unix  2      [ ACC ]   STREAM          LISTENING   12033  /run/systemd/journal/stdout
unix  7      [ ]    DGRAM          LISTENING   12035  /run/systemd/journal/socket
unix  2      [ ACC ]   SEQPACKET      LISTENING   12037  /run/udev/control
unix  2      [ ACC ]   STREAM          LISTENING   13936  /run/systemd/journal/io.systemd.journal
unix  2      [ ACC ]   STREAM          LISTENING   19659  /tmp/ssh-rrv0m9eh3irx/agent.743
unix  2      [ ACC ]   STREAM          LISTENING   19827  /tmp/.ICE-unix/743
unix  2      [ ACC ]   STREAM          LISTENING   17233  /tmp/.X11-unix/X0
unix  2      [ ACC ]   STREAM          LISTENING   15077  /run/dbus/system_bus_socket
unix  2      [ ACC ]   STREAM          LISTENING   19763  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  20439
unix  3      [ ]    STREAM          CONNECTED  21017
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
udp      0      0 10.0.2.15:bootpc       10.0.2.2:bootps      ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags     Type      State         I-Node  Path
unix  2      [ ]    DGRAM          LISTENING   19354  /run/user/1000/systemd/notify
unix  3      [ ]    DGRAM          LISTENING   12009  /run/systemd/notify
unix  2      [ ]    DGRAM          LISTENING   12025  /run/systemd/journal/syslog
unix 12     [ ]    DGRAM          LISTENING   12031  /run/systemd/journal/dev-log
unix  6      [ ]    DGRAM          LISTENING   12035  /run/systemd/journal/socket
unix  3      [ ]    STREAM          CONNECTED  20439
unix  3      [ ]    STREAM          CONNECTED  21017
unix  3      [ ]    STREAM          CONNECTED  19638  @/tmp/.X11-unix/X0
unix  3      [ ]    STREAM          CONNECTED  22344  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  21538
unix  3      [ ]    STREAM          CONNECTED  20594  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  20431
unix  3      [ ]    STREAM          CONNECTED  21014  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  19627
unix  3      [ ]    STREAM          CONNECTED  22342  /run/systemd/journal/stdout
unix  3      [ ]    STREAM          CONNECTED  21440  @/tmp/.ICE-unix/743
unix  3      [ ]    STREAM          CONNECTED  20587
unix  3      [ ]    STREAM          CONNECTED  20433
unix  3      [ ]    STREAM          CONNECTED  21018  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  19541  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  22341
unix  3      [ ]    STREAM          CONNECTED  21439
unix  3      [ ]    STREAM          CONNECTED  20590  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  20434  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  19540
unix  3      [ ]    STREAM          CONNECTED  22294  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  21436  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  20593
unix  3      [ ]    STREAM          CONNECTED  20437  @/tmp/.X11-unix/X0
```

```
(raman㉿kali)-[~]
└─$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address        State
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags     Type      State         I-Node  Path
unix  2      [ ]    DGRAM          LISTENING   19354  /run/user/1000/systemd/notify
unix  3      [ ]    DGRAM          LISTENING   12009  /run/systemd/notify
unix  2      [ ]    DGRAM          LISTENING   12025  /run/systemd/journal/syslog
unix 12     [ ]    DGRAM          LISTENING   12031  /run/systemd/journal/dev-log
unix  6      [ ]    DGRAM          LISTENING   12035  /run/systemd/journal/socket
unix  3      [ ]    STREAM          CONNECTED  20439
unix  3      [ ]    STREAM          CONNECTED  21017
unix  3      [ ]    STREAM          CONNECTED  19638  @/tmp/.X11-unix/X0
unix  3      [ ]    STREAM          CONNECTED  22344  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  21538
unix  3      [ ]    STREAM          CONNECTED  20594  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  20431
unix  3      [ ]    STREAM          CONNECTED  21014  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  19627
unix  3      [ ]    STREAM          CONNECTED  22342  /run/systemd/journal/stdout
unix  3      [ ]    STREAM          CONNECTED  21440  @/tmp/.ICE-unix/743
unix  3      [ ]    STREAM          CONNECTED  20587
unix  3      [ ]    STREAM          CONNECTED  20433
unix  3      [ ]    STREAM          CONNECTED  21018  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  19541  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  22341
unix  3      [ ]    STREAM          CONNECTED  21439
unix  3      [ ]    STREAM          CONNECTED  20590  @/tmp/dbus-n09SbSqNn9
unix  3      [ ]    STREAM          CONNECTED  20434  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  19540
unix  3      [ ]    STREAM          CONNECTED  22294  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  21436  /run/user/1000/bus
unix  3      [ ]    STREAM          CONNECTED  20593
unix  3      [ ]    STREAM          CONNECTED  20437  @/tmp/.X11-unix/X0
```

## NETSTAT S

```
(raman㉿kali)-[~]
$ netstat -s
Ip:
  Forwarding: 2
  24 total packets received
  1 with invalid addresses
  0 forwarded
  0 incoming packets discarded
  23 incoming packets delivered
  23 requests sent out
Icmp:
  0 ICMP messages received
  0 input ICMP message failed
  ICMP input histogram:
  0 ICMP messages sent
  0 ICMP messages failed
  ICMP output histogram:
Tcp:
  4 active connection openings
  0 passive connection openings
  4 failed connection attempts
  0 connection resets received
  0 connections established
  8 segments received
  8 segments sent out
  0 segments retransmitted
  0 bad segments received
  4 resets sent
Udp:
  12 packets received
  0 packets to unknown port received
  0 packet receive errors
  15 packets sent
  0 receive buffer errors
  0 send buffer errors
  IgnoredMulti: 3
```

## TRACERT

```
C:\Users\DELL>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.
-6	Force using IPv6.

```
C:\Users\DELL>
```

### Tracert S

```
C:\Users\DELL>tracert -S
```

```
A value must be supplied for option -S.
```

```
C:\Users\DELL>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\DELL>
```

### Tracert j

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

C:\Users\DELL>tracert -W
-W 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\DELL>
```

## Tracert

```
C:\Users\DELL>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\DELL>
```

## Route

```
C:\Users\DELL>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 * 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.*, *224*.

Pattern match is only allowed in PRINT command.
```

## nslookup

```
C:\Users\DELL>nslookup google.com
Server: www.huaweiimobilewifi.com
Address: 192.168.1.1

Non-authoritative answer:
Name: google.com
Addresses: 2404:6800:4009:826::200e
           142.250.195.46

C:\Users\DELL>
```

### Route -n

```
C:\Users\DELL>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
       reboots 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.
```

### Route -cn

```
C:\Users\DELL>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\*.

## Ping

```
C:\Users\DELL>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] [-R] [-S srcaddr] [-c compartment] [-p]
           [-4] [-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 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 routing header to test reverse route also (IPv6-only).
                 Per RFC 5095 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.
  -4            Force using IPv4.
  -6            Force using IPv6.
```

```
C:\Users\DELL>
```

### Ping /t 8.8.8.8

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

C:\Users\DELL>ping 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=52ms TTL=115
Reply from 8.8.8.8: bytes=32 time=73ms TTL=115
Reply from 8.8.8.8: bytes=32 time=63ms TTL=115
Reply from 8.8.8.8: bytes=32 time=57ms TTL=115

Ping statistics for 8.8.8.8:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 52ms, Maximum = 73ms, Average = 61ms

C:\Users\DELL>
```

## Getmac

```
C:\Users\DELL>getmac

Physical Address      Transport Name
=====
6C-2B-59-40-16-1E    Media disconnected
56-15-41-78-B1-FF   \Device\Tcpip_{F37024D7-8CDB-41CB-8EF3-D19F33CA816F}
0A-00-27-00-00-16   \Device\Tcpip_{FC602120-329F-4F93-BBF4-AD496F146CB1}

C:\Users\DELL>
```

## ARP

```
C:\Users\DELL>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]

-a          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.
-N 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\DELL>
```

## Systeminfo

```
C:\Users\DELL>systeminfo

Host Name: SUJITH
OS Name: Microsoft Windows 10 Home Single Language
OS Version: 10.0.19044 N/A Build 19044
OS Manufacturer: Microsoft Corporation
OS Configuration: Standalone Workstation
OS Build Type: Multiprocessor Free
Registered Owner: DELL
Registered Organization: N/A
Product ID: 00327-35116-23847-AAOEM
Original Install Date: 25-11-2020, 19:37:40
System Boot Time: 13-09-2021, 08:31:11
System Manufacturer: Dell Inc.
System Model: Inspiron 3576
System Type: x64-based PC
Processor(s): 1 Processor(s) Installed.
[01]: Intel64 Family 6 Model 142 Stepping 10 GenuineIntel ~2
BIOS Version: Dell Inc. 1.10.0, 09-01-2020
Windows Directory: C:\WINDOWS
System Directory: C:\WINDOWS\system32
Boot Device: \Device\HarddiskVolume1
System Locale: en-us;English (United States)
Input Locale: 00004009
Time Zone: (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory: 8,057 MB
Available Physical Memory: 1,810 MB
Virtual Memory: Max Size: 9,337 MB
Virtual Memory: Available: 2,588 MB
Virtual Memory: In Use: 6,749 MB
Page File Location(s): C:\pagefile.sys
Domain: WORKGROUP
Logon Server: \\SUJITH
Hotfix(s): 12 Hotfix(s) Installed.
[01]: KB5004331
[02]: KB4562830
[03]: KB4580325
[04]: KB4584229
[05]: KB4586864
[06]: KB4593175
[07]: KB4598481
[08]: KB5000736
[09]: KB5003791
[10]: KB5005033
[11]: KB5005260
```

### Pathping

```
C:\Users\DELL>pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
                [-p period] [-q num_queries] [-w timeout]
                [-4] [-6] target_name

Options:
  -g 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\DELL>
```

## Nbtstat

```
C:\Users\DELL>nbtstat

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

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

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

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

```
C:\Users\DELL>
```

## Ping linux

```
(raman㉿kali)-[~]
└─$ ping 0
PING 0 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.022 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.035 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.035 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.037 ms
64 bytes from 127.0.0.1: icmp_seq=13 ttl=64 time=0.033 ms
64 bytes from 127.0.0.1: icmp_seq=14 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=15 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=16 ttl=64 time=0.037 ms
64 bytes from 127.0.0.1: icmp_seq=17 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=18 ttl=64 time=0.037 ms
64 bytes from 127.0.0.1: icmp_seq=19 ttl=64 time=0.041 ms
64 bytes from 127.0.0.1: icmp_seq=20 ttl=64 time=0.033 ms
64 bytes from 127.0.0.1: icmp_seq=21 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=22 ttl=64 time=0.045 ms
64 bytes from 127.0.0.1: icmp_seq=23 ttl=64 time=0.035 ms
64 bytes from 127.0.0.1: icmp_seq=24 ttl=64 time=0.041 ms
64 bytes from 127.0.0.1: icmp_seq=25 ttl=64 time=0.038 ms
64 bytes from 127.0.0.1: icmp_seq=26 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=27 ttl=64 time=0.034 ms
64 bytes from 127.0.0.1: icmp_seq=28 ttl=64 time=0.033 ms
64 bytes from 127.0.0.1: icmp_seq=29 ttl=64 time=0.446 ms
64 bytes from 127.0.0.1: icmp_seq=30 ttl=64 time=0.036 ms
64 bytes from 127.0.0.1: icmp_seq=31 ttl=64 time=0.036 ms
```

```
(raman㉿kali)-[~]
$ ping -c
ping: option requires an argument -- 'c'

Usage
  ping [options] <destination>

Options:
<destination>      dns name or ip address
-a                  use audible ping
-A                  use adaptive ping
-B                  sticky source address
-c <count>         stop after <count> replies
-D                  print timestamps
-d                  use SO_DEBUG socket option
-f                  flood ping
-h                  print help and exit
-I <interface>    either interface name or address
-i <interval>     seconds between sending each packet
-L                  suppress loopback of multicast packets
-l <preload>       send <preload> number of packages while waiting replies
-m <mark>          tag the packets going out
-M <pmtud opt>    define mtu discovery, can be one of <do|dont|want>
-n                  no dns name resolution
-O                  report outstanding replies
-p <pattern>       contents of padding byte
-q                  quiet output
-Q <tclass>        use quality of service <tclass> bits
-s <size>          use <size> as number of data bytes to be sent
-S <size>          use <size> as SO_SNDBUF socket option value
-t <ttl>           define time to live
-U                  print user-to-user latency
-v                  verbose output
-V                  print version and exit
-w <deadline>     reply wait <deadline> in seconds
-W <timeout>       time to wait for response
```

## Ls

```
(raman㉿kali)-[~]
$ ls
allfiles.txt  Documents  f1.txt.gz  f3.txt    f3.txt.xz  f4.txt.xz  myfile2.txt  pic6.pg  Pictures  rsa      Templates  work
desktop       Downloads  f2.txt.xz  f1.txt.gz  f4.txt    Music      myfile.txt  pic7.pg  Public    rsa.pub  Videos
```

Sudo apt update

```
File Actions Edit View Help
└─(raman㉿kali)-[~]
$ sudo apt update
[sudo] password for raman:
Ign:1 http://repo.mongodb.org/apt/debian buster/mongodb-org/5.0 InRelease
Hit:2 http://repo.mongodb.org/apt/debian buster/mongodb-org/5.0 Release
Get:3 http://ftp.harukasan.org/kali kali-rolling InRelease [30.5 kB]
Get:5 http://ftp.harukasan.org/kali kali-rolling/main amd64 Packages [17.9 MB]
Get:6 http://ftp.harukasan.org/kali kali-rolling/contrib amd64 Packages [108 kB]
Get:7 http://ftp.harukasan.org/kali kali-rolling/non-free amd64 Packages [209 kB]
Fetched 18.3 MB in 1min 46s (173 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
1486 packages can be upgraded. Run 'apt list --upgradable' to see them.
```

sudo apt install apache2

```
└─(raman㉿kali)-[~]
$ sudo apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
apache2 is already the newest version (2.4.48-4).
apache2 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 1486 not upgraded.
```

sudo systemctl status apache2

```
└─(raman㉿kali)-[~]
$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; disabled; vendor>
   Active: active (running) since Wed 2021-09-29 09:43:05 IST; 4s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 1431 ExecStart=/usr/sbin/apachectl start (code=exited, status>
   Main PID: 1442 (apache2)
      Tasks: 6 (limit: 2309)
     Memory: 17.9M
        CPU: 0.000 CPU(s) since start
       CGroup: /system.slice/apache2.service
               ├─1442 /usr/sbin/apache2 -k start
               ├─1444 /usr/sbin/apache2 -k start
               ├─1445 /usr/sbin/apache2 -k start
               ├─1446 /usr/sbin/apache2 -k start
               ├─1447 /usr/sbin/apache2 -k start
               └─1448 /usr/sbin/apache2 -k start

Sep 29 09:43:04 kali systemd[1]: Starting The Apache HTTP Server ...
Sep 29 09:43:05 kali systemd[1]: Started The Apache HTTP Server.
lines 1-18/18 (END)
```

```
sudo apt install apache2
```

```
[~] (raman㉿kali)-[~]
└─$ sudo apt install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
apache2 is already the newest version (2.4.48-4).
apache2 set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 1486 not upgraded.
```

```
[~] (raman㉿kali)-[~]
└─$ sudo apt install mariadb-server mariadb-client          130 ✘
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required
:
libreadline5
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  default-mysql-server galera-4 mariadb-client-10.5
  mariadb-client-core-10.5 mariadb-common mariadb-server-10.5
  mariadb-server-core-10.5
Suggested packages:
  mailx mariadb-test netcat-openbsd
The following packages will be REMOVED:
  galera-3 mariadb-client-10.3 mariadb-client-core-10.3
  mariadb-server-10.3 mariadb-server-core-10.3
The following NEW packages will be installed:
  galera-4 mariadb-client mariadb-client-10.5 mariadb-client-core-10.5
  mariadb-server mariadb-server-10.5 mariadb-server-core-10.5
The following packages will be upgraded:
  default-mysql-server mariadb-common
2 upgraded, 7 newly installed, 5 to remove and 1483 not upgraded.
Need to get 14.0 MB of archives.
After this operation, 11.7 MB disk space will be freed.
Do you want to continue? [Y/n] y
Get:1 http://ftp.harukasan.org/kali kali-rolling/main amd64 mariadb-common
all 1:10.5.12-1 [36.3 kB]
Get:2 http://ftp.harukasan.org/kali kali-rolling/main amd64 default-mysql-s
erver all 1:0.7 [3,712 B]
```

```
—(raman㉿kali)-[~]
$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
  Loaded: loaded (/lib/systemd/system/apache2.service; disabled; vendor>
  Active: active (running) since Wed 2021-09-29 09:43:05 IST; 4s ago
    Docs: https://httpd.apache.org/docs/2.4/
  Process: 1431 ExecStart=/usr/sbin/apachectl start (code=exited, status>
  Main PID: 1442 (apache2)
    Tasks: 6 (limit: 2309)
   Memory: 17.9M
      CGroup: /system.slice/apache2.service
              └─1442 /usr/sbin/apache2 -k start
Home: 1444 /usr/sbin/apache2 -k start
      1445 /usr/sbin/apache2 -k start
      1446 /usr/sbin/apache2 -k start
      1447 /usr/sbin/apache2 -k start
      1448 /usr/sbin/apache2 -k start

Sep 29 09:43:04 kali systemd[1]: Starting The Apache HTTP Server ...
Sep 29 09:43:05 kali systemd[1]: Started The Apache HTTP Server.
lines 1-18/18 (FNR)
```

```
└ $ sudo systemctl status mysql
● mariadb.service - MariaDB 10.5.12 database server
  Loaded: loaded (/lib/systemd/system/mariadb.service; disabled; vendor preset: disabled)
  Active: inactive (dead)
    Docs: man:mariadb(8)
          https://mariadb.com/kb/en/library/systemd/
```

```
└ $ sudo apt install mariadb-server mariadb-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
:
  libreadline5
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  default-mysql-server galera-4 mariadb-client-10.5
  mariadb-client-core-10.5 mariadb-common mariadb-server-10.5
  mariadb-server-core-10.5
Suggested packages:
  mailx mariadb-test netcat-openbsd
The following packages will be REMOVED:
  galera-3 mariadb-client-10.3 mariadb-client-core-10.3
  mariadb-server-10.3 mariadb-server-core-10.3
The following NEW packages will be installed:
  galera-4 mariadb-client mariadb-client-10.5 mariadb-client-core-10.5
  mariadb-server mariadb-server-10.5 mariadb-server-core-10.5
The following packages will be upgraded:
  default-mysql-server mariadb-common
130 ×
```

## **Q. Explain the steps for the installation of ansible with your own screenshots.**

Install ansible sudo apt install ansible ansible --version

```
su@jith@LAPTOP-4DJBQ1Q:~$ sudo apt install ansible
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-dnspython python3-jmespath python3-kerberos python3-libc
  python3-lockfile python3-netaddr python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-se
  python3-winrm python3-xmldict
Suggested packages:
  cowsay sshpass python-lockfile-doc ipython3 python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-dnspython python3-jmespath python3-kerberos
  python3-libcloud python3-lockfile python3-netaddr python3-ntlm-auth python3-requests-kerberos python3-requests
  python3-selinux python3-winrm python3-xmldict
0 upgraded, 16 newly installed, 0 to remove and 55 not upgraded.
Need to get 7492 kB/9643 kB of archives.
After this operation, 90.2 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 ansible all 2.9.6+dfsg-1 [5794 kB]
Get:2 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-argcomplete all 1.8.1-1.3ubuntu1 [27.2 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal/main amd64 python3-jmespath all 0.9.4-2 [21.3 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-kerberos amd64 1.1.14-3.1build1 [22.6 kB]
Get:5 http://archive.ubuntu.com/ubuntu focal/main amd64 python3-lockfile all 1:0.12.2-2ubuntu2 [14.6 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-libcloud all 2.8.0-1 [1403 kB]
Get:7 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-ntlm-auth all 1.1.0-1 [19.6 kB]
Get:8 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:9 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-ntlm all 1.1.0-1 [6004 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-selinux amd64 3.0-1build2 [139 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-xmldict all 0.12.0-1 [12.6 kB]
Get:12 http://archive.ubuntu.com/ubuntu focal/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Fetched 4542 kB in 7s (625 kB/s)
Selecting previously unselected package python3-crypto.
(Reading database ... 33017 files and directories currently installed.)
Preparing to unpack .../00-python3-crypto_2.6.1-13ubuntu2_amd64.deb ...
Unpacking python3-crypto (2.6.1-13ubuntu2) ...
Selecting previously unselected package python3-dnspython.
Preparing to unpack .../01-python3-dnspython_1.16.0-1build1_all.deb ...
Unpacking python3-dnspython (1.16.0-1build1) ...
Selecting previously unselected package ieee-data.
Preparing to unpack .../02-ieee-data_20180805.1_all.deb ...
Unpacking ieee-data (20180805.1) ...
Selecting previously unselected package python3-netaddr.
Preparing to unpack .../03-python3-netaddr_0.7.19-3_all.deb ...
Unpacking python3-netaddr (0.7.19-3) ...
Selecting previously unselected package ansible.
Preparing to unpack .../04-ansible_2.9.6+dfsg-1_all.deb ...
Unpacking ansible (2.9.6+dfsg-1) ...
Selecting previously unselected package python3-argcomplete.
Preparing to unpack .../05-python3-argcomplete_1.8.1-1.3ubuntu1_all.deb ...
Unpacking python3-argcomplete (1.8.1-1.3ubuntu1) ...
```

**Q. Execute tcpdump and its options on your own system, and submit the output screenshot as a document.**

Install `tcpdump` `sudo apt update && sudo apt`

install `tcpdump`

```
suji@LAPTOP-4DJB01Q:~$ sudo apt update && sudo apt install tcpdump
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:2 http://archive.ubuntu.com/ubuntu focal InRelease
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]
Fetched 328 kB in 4s (86.0 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
55 packages can be upgraded. Run 'apt list --upgradable' to see them.
Reading package lists... Done
Building dependency tree
Reading state information... Done
tcpdump is already the newest version (4.9.3-4).
0 upgraded, 0 newly installed, 0 to remove and 55 not upgraded.
```

Execute `tcpdump`

```
suji@LAPTOP-4DJB01Q:~$ sudo tcpdump
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on eth0, link-type EN10MB (Ethernet), capture size 20244 bytes
12:34:40.105302 IP LAPTOP-4DJB01Q.mshome.net.netbios-ns > 172.18.175.255.netbios-ns: UDP, length 50
12:34:40.105747 IP 172.18.169.231.38546 > LAPTOP-4DJB01Q.mshome.net.domain: 63073+ PTR? 255.175.18.172.in-addr.arpa. (45)
12:34:40.106889 IP LAPTOP-4DJB01Q.mshome.net.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:40.107261 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:40.855488 IP LAPTOP-4DJB01Q.mshome.net.netbios-ns > 172.18.175.255.netbios-ns: UDP, length 50
12:34:40.891418 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:40.892118 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:41.105938 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:41.106744 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:41.606775 IP LAPTOP-4DJB01Q.mshome.net.netbios-ns > 172.18.175.255.netbios-ns: UDP, length 50
12:34:41.888354 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:41.888978 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 255.175.18.172.in-addr.arpa.local. (51)
12:34:41.895623 IP LAPTOP-4DJB01Q.mshome.net.domain > 172.18.169.231.38546: 63073 NODomain 0/0/0 (45)
12:34:41.896682 IP 172.18.169.231.35000 > LAPTOP-4DJB01Q.mshome.net.domain: 73834+ PTR? 1.169.18.172.in-addr.arpa. (43)
12:34:41.897378 IP LAPTOP-4DJB01Q.mshome.net.domain > 172.18.169.231.35000: 23834- 1/0/0 PTR LAPTOP-4DJB01Q.mshome.net. (108)
12:34:41.898038 IP 172.18.169.231.44789 > LAPTOP-4DJB01Q.mshome.net.domain: 44649+ PTR? 231.169.18.172.in-addr.arpa. (45)
12:34:41.899948 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:41.900487 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:42.176257 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:42.176909 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:42.890184 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:42.891868 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:43.172228 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:43.172857 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 231.169.18.172.in-addr.arpa.local. (51)
12:34:43.176838 IP LAPTOP-4DJB01Q.mshome.net.domain > 172.18.169.231.44789: 44649 NODomain 0/0/0 (45)
12:34:43.177237 IP 172.18.169.231.34382 > LAPTOP-4DJB01Q.mshome.net.domain: 21100+ PTR? 251.0.0.224.in-addr.arpa. (42)
12:34:43.177918 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:43.179732 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:43.245402 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:43.245993 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:44.189575 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:44.190351 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:44.251943 IP LAPTOP-4DJB01Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
12:34:44.252691 IP6 LAPTOP-4DJB01Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 251.0.0.224.in-addr.arpa.local. (48)
```

```
tcpdump -D
```

```
sujith@LAPTOP-4DJBA01Q:~$ tcpdump -D
1.eth0 [Up, Running]
2.lo [Up, Running, Loopback]
3.any (Pseudo-device that captures on all interfaces) [Up, Running]
4.bluetooth-monitor (Bluetooth Linux Monitor) [none]
5.nflog (Linux netfilter log (NFLOG) interface) [none]
6.nfqueue (Linux netfilter queue (NFQUEUE) interface) [none]
7(dummy0 [none]
8.tun10 [none]
9.sit0 [none]
10.bond0 [none]
```

```
sujith@LAPTOP-4DJBA01Q:~$ sudo tcpdump -i enp2s0
tcpdump: enp2s0: No such device exists
(SIOCGIFHWADDR: No such device)
sujith@LAPTOP-4DJBA01Q:~$
```

Sudo tcpdump -c 5

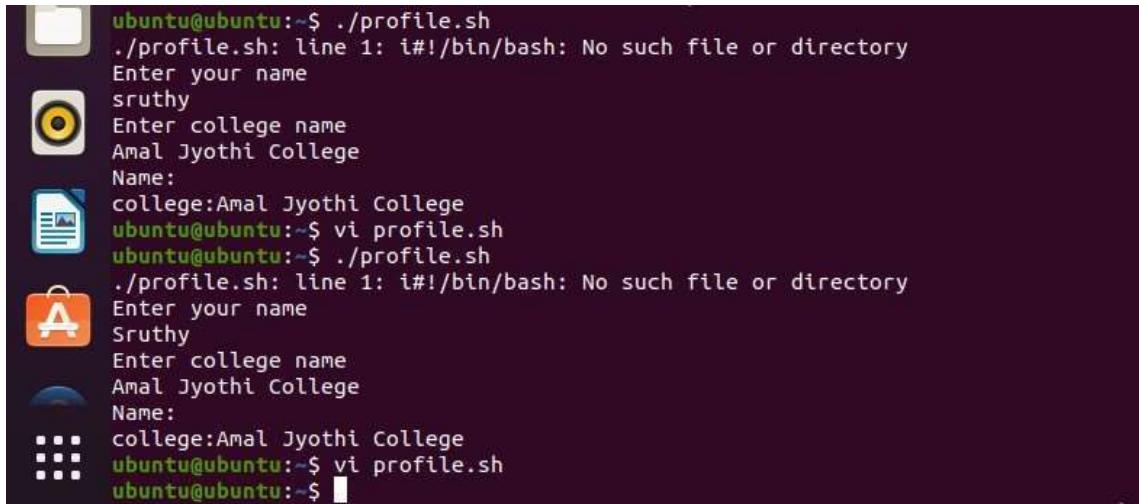
```
sujith@LAPTOP-4DJBA01Q:~$ sudo tcpdump -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on eth0, link-type EN10MB (Ethernet), capture size 262144 bytes
12:39:29.377292 IP LAPTOP-4DJBA01Q.eshome.net.49545 > 239.255.255.250.1980: UDP, length 173
12:39:29.377768 IP 172.38.189.231.42220 > LAPTOP-4DJBA01Q.eshome.net.domain: 9149+ PTR? 250.255.255.239.in-addr.arpa. (46)
12:39:29.379826 IP LAPTOP-4DJBA01Q.eshome.net.mdns > 224.0.0.251.mdns: 0 PTR? (Q)?: 250.255.255.239.in-addr.arpa.local. (52)
12:39:29.379293 IP6 LAPTOP-4DJBA01Q.eshome.net.mdns > ff02::fb.mdns: 0 PTR? (Q)?: 250.255.255.239.in-addr.arpa.local. (52)
12:39:29.895810 IP LAPTOP-4DJBA01Q.eshome.net.mdns > 224.0.0.251.mdns: 0 PTR? (Q)?: 250.255.255.239.in-addr.arpa.local. (52)
5 packets captured
96 packets received by filter
0 packets dropped by kernel
```

## 1. vi

```
Thunderbird Mail alBox:~/Desktop$ vi raman.sh
user@user-VirtualBox:~/Desktop$ vi biod.sh
user@user-VirtualBox:~/Desktop$ cat vi biod.sh
cat: vi: No such file or directory

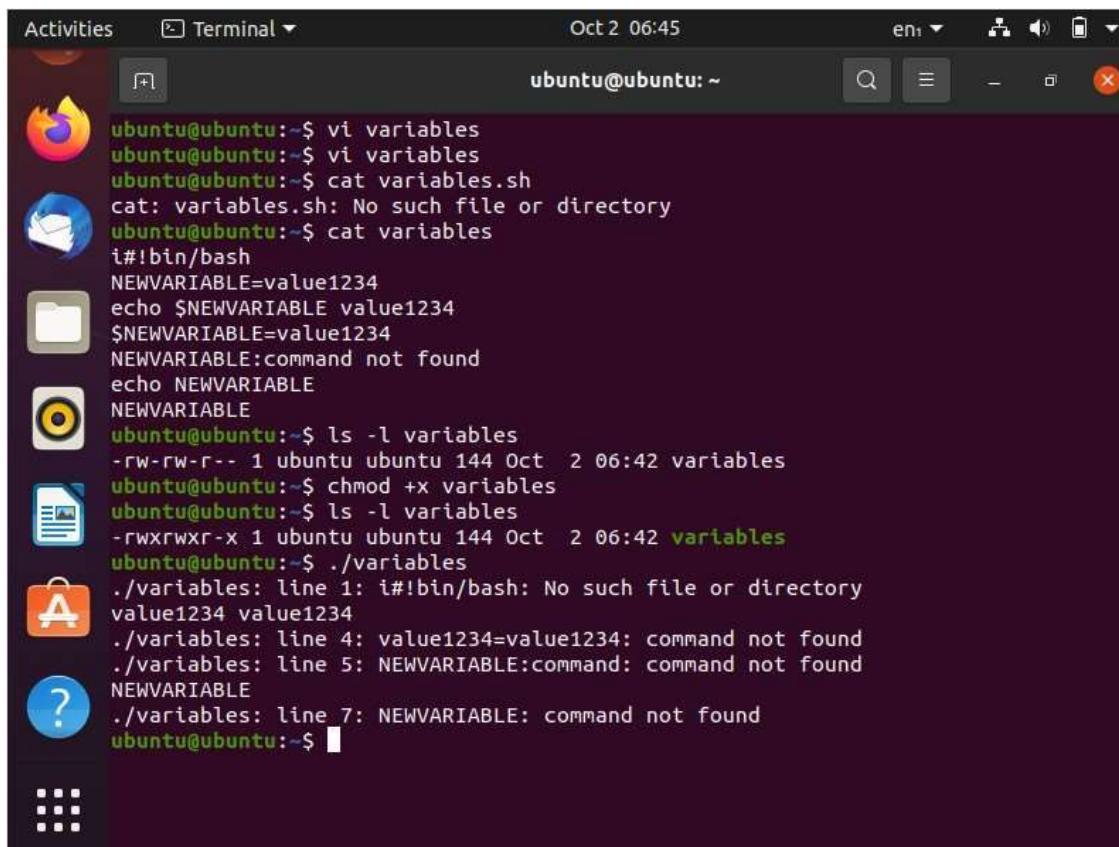
echo enter your name
read sujithj
echo enter college name
read amal jyothi college
echo Name:$name
echo college:$amal jyothi college
```

```
user@user-VirtualBox:~/Desktop$ ls -l biod.sh
-rw-rw-r-- 1 user user 135 Oct  2 22:44 biod.sh
user@user-VirtualBox:~/Desktop$ chmod +x biod.sh
user@user-VirtualBox:~/Desktop$ ls -l biod.sh
-rwxrwxr-x 1 user user 135 Oct  2 22:44 biod.sh
user@user-VirtualBox:~/Desktop$ ./biod.sh
enter your name
; Terminal
enter college name
amal jyothi college
Name:
college:amal jyothi college
```



```
ubuntu@ubuntu:~$ ./profile.sh
./profile.sh: line 1: i#!/bin/bash: No such file or directory
Enter your name
sruthy
Enter college name
Amal Jyothi College
Name:
college:Amal Jyothi College
ubuntu@ubuntu:~$ vi profile.sh
ubuntu@ubuntu:~$ ./profile.sh
./profile.sh: line 1: i#!/bin/bash: No such file or directory
Enter your name
Sruthy
Enter college name
Amal Jyothi College
Name:
college:Amal Jyothi College
ubuntu@ubuntu:~$ vi profile.sh
ubuntu@ubuntu:~$
```

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



```
Activities Terminal Oct 2 06:45 en1
ubuntu@ubuntu:~$ vi variables
ubuntu@ubuntu:~$ vi variables
ubuntu@ubuntu:~$ cat variables.sh
cat: variables.sh: No such file or directory
ubuntu@ubuntu:~$ cat variables
#!/bin/bash
NEWVARIABLE=value1234
echo $NEWWVARIABLE value1234
$NEWWVARIABLE=value1234
NEWVARIABLE:command not found
echo NEWVARIABLE
NEWVARIABLE
ubuntu@ubuntu:~$ ls -l variables
-rw-rw-r-- 1 ubuntu ubuntu 144 Oct  2 06:42 variables
ubuntu@ubuntu:~$ chmod +x variables
ubuntu@ubuntu:~$ ls -l variables
-rwxrwxr-x 1 ubuntu ubuntu 144 Oct  2 06:42 variables
ubuntu@ubuntu:~$ ./variables
./variables: line 1: i#!/bin/bash: No such file or directory
value1234 value1234
./variables: line 4: value1234=value1234: command not found
./variables: line 5: NEWVARIABLE:command: command not found
NEWVARIABLE
./variables: line 7: NEWVARIABLE: command not found
ubuntu@ubuntu:~$
```

```
i#!bin/bash
NEWVARIABLE=value1234
echo $NEWWVARIABLE value1234
$NEWWVARIABLE=value1234
NEWWVARIABLE:command not found
echo NEWVARIABLE
NEWWVARIABLE
```

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

Activities Terminal Oct 2 09:26 en1

```
i#!bin/bash
a=100
b=20
add=$((a + b))
echo $add
sub=$((a - b))
echo $sub
mul=$((a * b))
echo $mul
div=$((a / b))
echo $div
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
operations.sh 16 lines, 129 characters
```

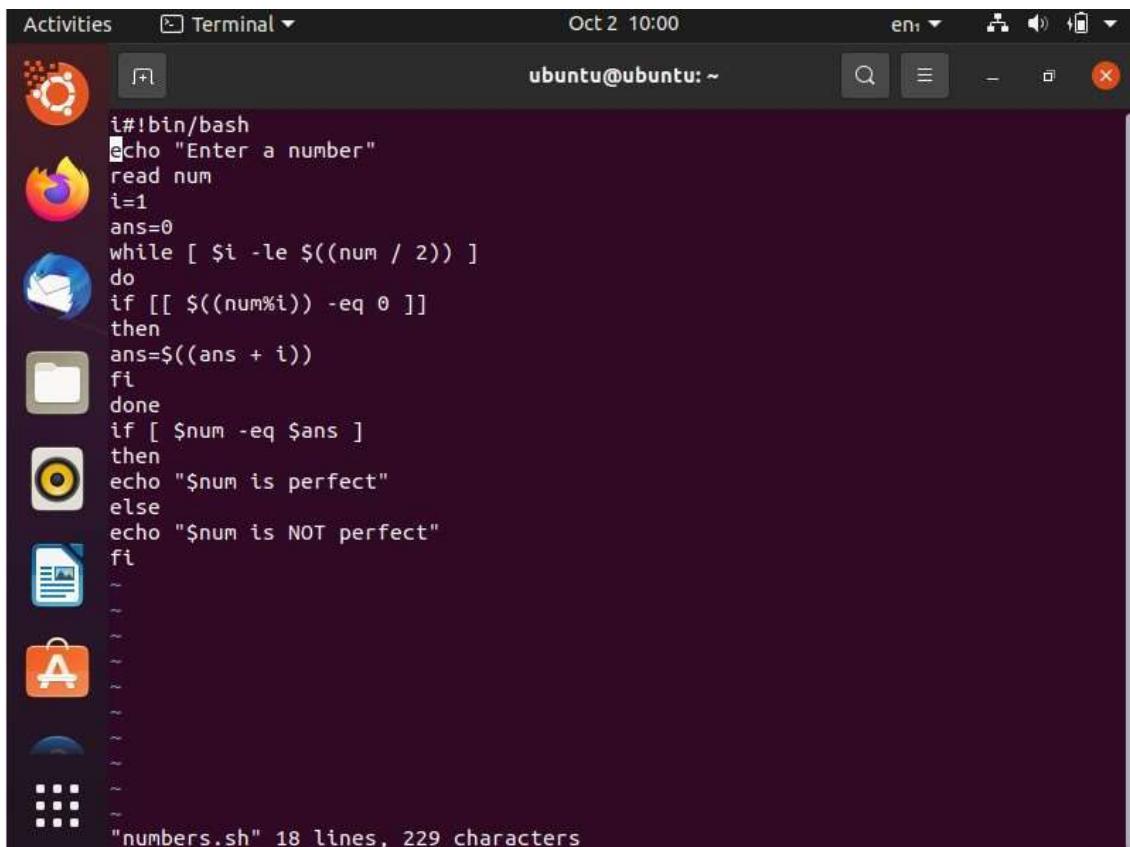
Activities Terminal Oct 2 09:26 en1

```
ubuntu@ubuntu:~$ cat operations.sh
i#!bin/bash
a=100
b=20

add=$((a + b))
echo $add
sub=$((a - b))
echo $sub
mul=$((a * b))
echo $mul
div=$((a / b))
echo $div

ubuntu@ubuntu:~$ ls -l operations.sh
-rw-rw-r-- 1 ubuntu ubuntu 129 Oct  2 09:24 operations.sh
ubuntu@ubuntu:~$ chmod +x operations.sh
ubuntu@ubuntu:~$ ls -l operations.sh
-rwxrwxr-x 1 ubuntu ubuntu 129 Oct  2 09:24 operations.sh
ubuntu@ubuntu:~$ ./operations.sh
./operations.sh: line 1: i#!bin/bash: No such file or directory
120
80
2000
5
ubuntu@ubuntu:~$
```

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



The image shows a screenshot of an Ubuntu desktop environment. In the top left corner, there's a dock with icons for the Dash, Home, and several other applications like the Dash, Home, and Dash. The main focus is a terminal window titled "Terminal". The terminal window has a dark purple background and contains the following shell script:

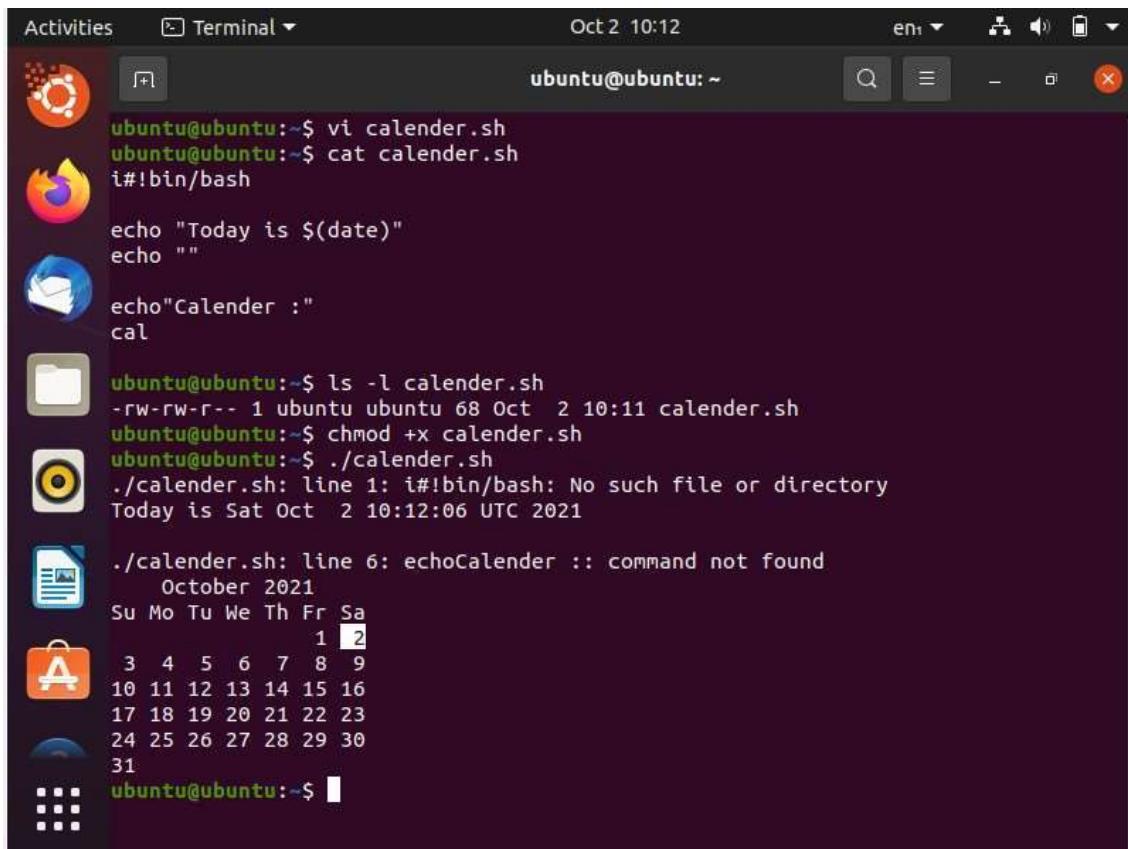
```
#!/bin/bash
echo "Enter a number"
read num
i=1
ans=0
while [ $i -le $((num / 2)) ]
do
if [[ $((num%i)) -eq 0 ]]
then
ans=$((ans + i))
fi
done
if [ $num -eq $ans ]
then
echo "$num is perfect"
else
echo "$num is NOT perfect"
fi
```

At the bottom of the terminal window, it says "numbers.sh" 18 lines, 229 characters.

Activities Terminal Oct 2 10:05 en1

```
echo "Enter a number"
read no
i=1
ans=0
while [ $i -le $(($no / 2)) ]
do
if [[ $(($no%i)) -eq 0 ]]
then ans=$(($ans + i))
fi
i=$((i +1))
done
if [ $no -eq $ans ]
then
echo "$no is perfect"
else
echo "no is not perfect"
fi
ubuntu@ubuntu:~$ ls -l number.sh
-rwxrwxr-x 1 ubuntu ubuntu 233 Oct  2 09:42 number.sh
ubuntu@ubuntu:~$ chmod +x number.sh
ubuntu@ubuntu:~$ ls -l number.sh
-rwxrwxr-x 1 ubuntu ubuntu 233 Oct  2 09:42 number.sh
ubuntu@ubuntu:~$ ./number.sh
./number.sh: line 1: i#!bin/bash: No such file or directory
Enter a number
7
./number.sh: line 6: [: missing `]'
no is not perfect
ubuntu@ubuntu:~$
```

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



The screenshot shows a terminal window on an Ubuntu desktop. The terminal output is as follows:

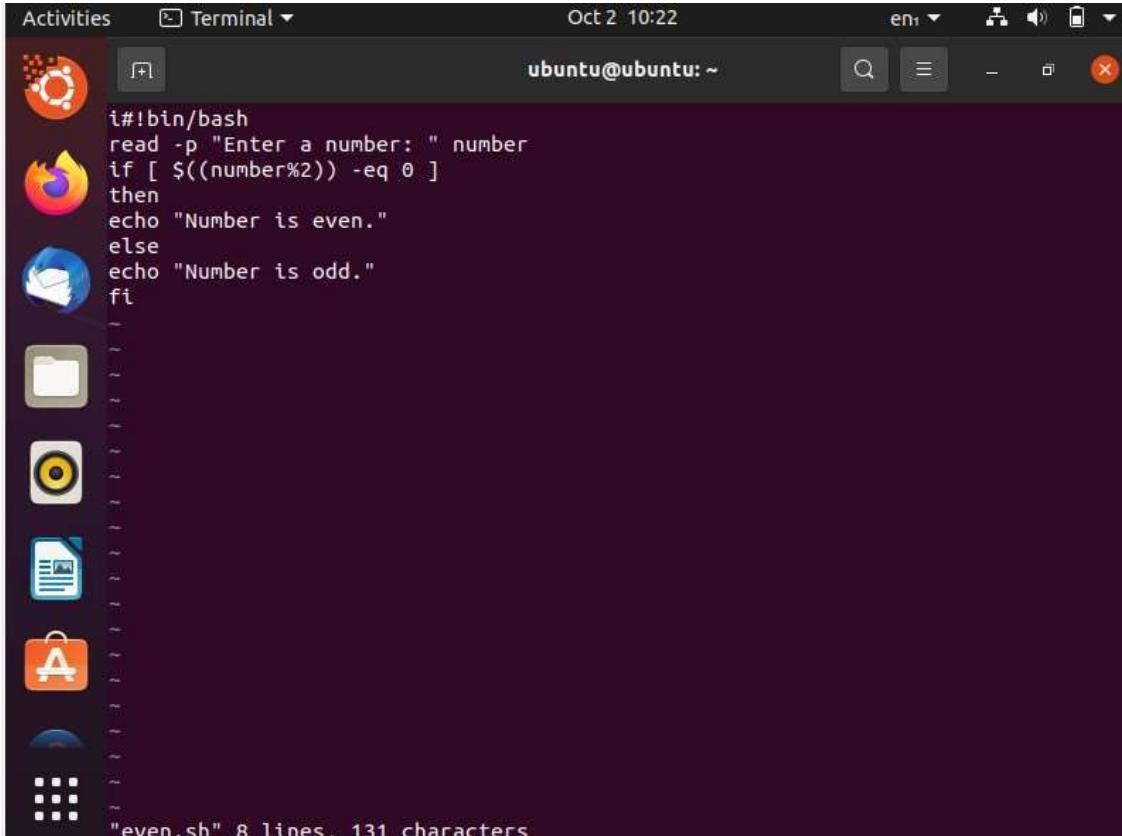
```
Activities Terminal Oct 2 10:12 en1
ubuntu@ubuntu:~$ vi calender.sh
ubuntu@ubuntu:~$ cat calender.sh
#!/bin/bash
echo "Today is $(date)"
echo ""
echo "Calender :"
cal

ubuntu@ubuntu:~$ ls -l calender.sh
-rw-rw-r-- 1 ubuntu ubuntu 68 Oct  2 10:11 calender.sh
ubuntu@ubuntu:~$ chmod +x calender.sh
ubuntu@ubuntu:~$ ./calender.sh
./calender.sh: line 1: i#!bin/bash: No such file or directory
Today is Sat Oct  2 10:12:06 UTC 2021

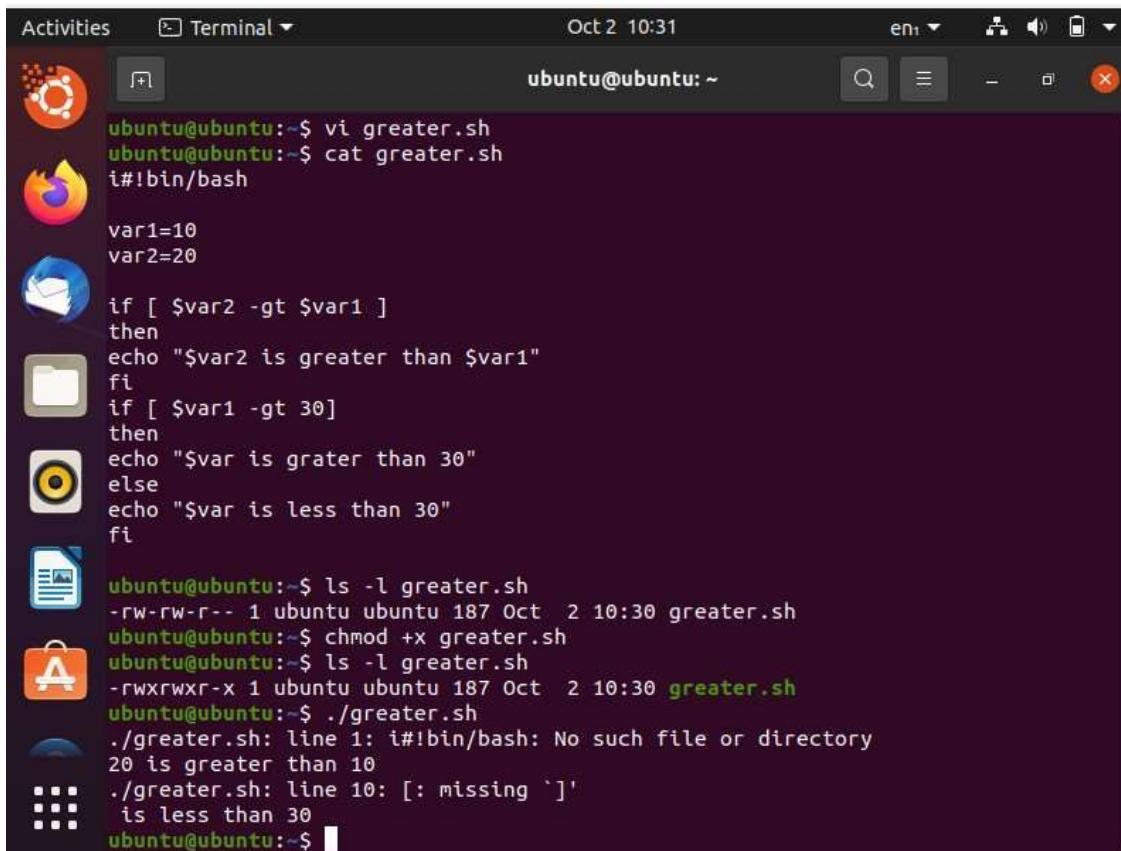
./calender.sh: line 6: echoCalender :: command not found
          October 2021
Su Mo Tu We Th Fr Sa
      1 2
 3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
ubuntu@ubuntu:~$
```

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

```
Activities Terminal Oct 2 10:21 en: ubunto@ubuntu:~ 
  ubuntu@ubuntu:~$ vi even.sh
ubuntu@ubuntu:~$ cat even.sh
#!/bin/bash
read -p "Enter a number: " number
if [ $((number%2)) -eq 0 ]
then
echo "Number is even."
else
echo "Number is odd."
fi
ubuntu@ubuntu:~$ ls -l even.sh
-rw-rw-r-- 1 ubuntu ubuntu 131 Oct  2 10:18 even.sh
ubuntu@ubuntu:~$ chmod +x even.sh
ubuntu@ubuntu:~$ ls -l even.sh
-rwxrwxr-x 1 ubuntu ubuntu 131 Oct  2 10:18 even.sh
ubuntu@ubuntu:~$ ./even.sh
./even.sh: line 1: i#!bin/bash: No such file or directory
Enter a number: 88
Number is even.
ubuntu@ubuntu:~$ 67
 67: command not found
```



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



The image shows a screenshot of an Ubuntu desktop environment. In the top left corner, there's a dock with icons for the Dash, Home, Activities, and Terminal. The terminal window is open and titled "Terminal". The window shows the following command-line session:

```
Activities Terminal Oct 2 10:31 en1
ubuntu@ubuntu:~$ vi greater.sh
ubuntu@ubuntu:~$ cat greater.sh
#!/bin/bash

var1=10
var2=20

if [ $var2 -gt $var1 ]
then
echo "$var2 is greater than $var1"
fi
if [ $var1 -gt 30]
then
echo "$var is grater than 30"
else
echo "$var is less than 30"
fi

ubuntu@ubuntu:~$ ls -l greater.sh
-rw-rw-r-- 1 ubuntu ubuntu 187 Oct  2 10:30 greater.sh
ubuntu@ubuntu:~$ chmod +x greater.sh
ubuntu@ubuntu:~$ ls -l greater.sh
-rwxrwxr-x 1 ubuntu ubuntu 187 Oct  2 10:30 greater.sh
ubuntu@ubuntu:~$ ./greater.sh
./greater.sh: line 1: i#!bin/bash: No such file or directory
20 is greater than 10
./greater.sh: line 10: [: missing ']'
is less than 30
ubuntu@ubuntu:~$
```

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

Activities Terminal Oct 2 10:42 en1

```
ubuntu@ubuntu:~$ vi first.sh
ubuntu@ubuntu:~$ cat first.sh
#!/bin/bash
echo "Enter Size(N)"
read N
i=1
sum=0
echo "Enter Numbers"
while [ $i -le $N ]
do
    read num
    sum=$((sum + num))
    i=$((i + 1))
done
echo $sum

ubuntu@ubuntu:~$ ls -l first.sh
-rw-rw-r-- 1 ubuntu ubuntu 152 Oct  2 10:40 first.sh
ubuntu@ubuntu:~$ chmod +x first.sh
ubuntu@ubuntu:~$ ls -l first.sh
-rwxrwxr-x 1 ubuntu ubuntu 152 Oct  2 10:40 first.sh
ubuntu@ubuntu:~$ ./first.sh
./first.sh: line 1: i#!bin/bash: No such file or directory
Enter Size(N)
10
Enter Numbers
1
2
3
```

Activities Terminal Oct 2 10:42 en1

```
ubuntu@ubuntu:~$ do
read num
sum=$((sum + num))
i=$((i + 1))
done
echo $sum

ubuntu@ubuntu:~$ ls -l first.sh
-rw-rw-r-- 1 ubuntu ubuntu 152 Oct  2 10:40 first.sh
ubuntu@ubuntu:~$ chmod +x first.sh
ubuntu@ubuntu:~$ ls -l first.sh
-rwxrwxr-x 1 ubuntu ubuntu 152 Oct  2 10:40 first.sh
ubuntu@ubuntu:~$ ./first.sh
./first.sh: line 1: i#!bin/bash: No such file or directory
Enter Size(N)
10
Enter Numbers
1
2
3
4
5
6
7
8
9
10
55
```

Activities Terminal Oct 2 10:43 en1

```
i#!bin/bash
echo "Enter Size(N)"
read N
i=1
sum=0
echo "Enter Numbers"
while [ $i -le $N ]
do
    read num
    sum=$((sum + num))
    i=$((i + 1))
done
echo $sum

~
~
~
```

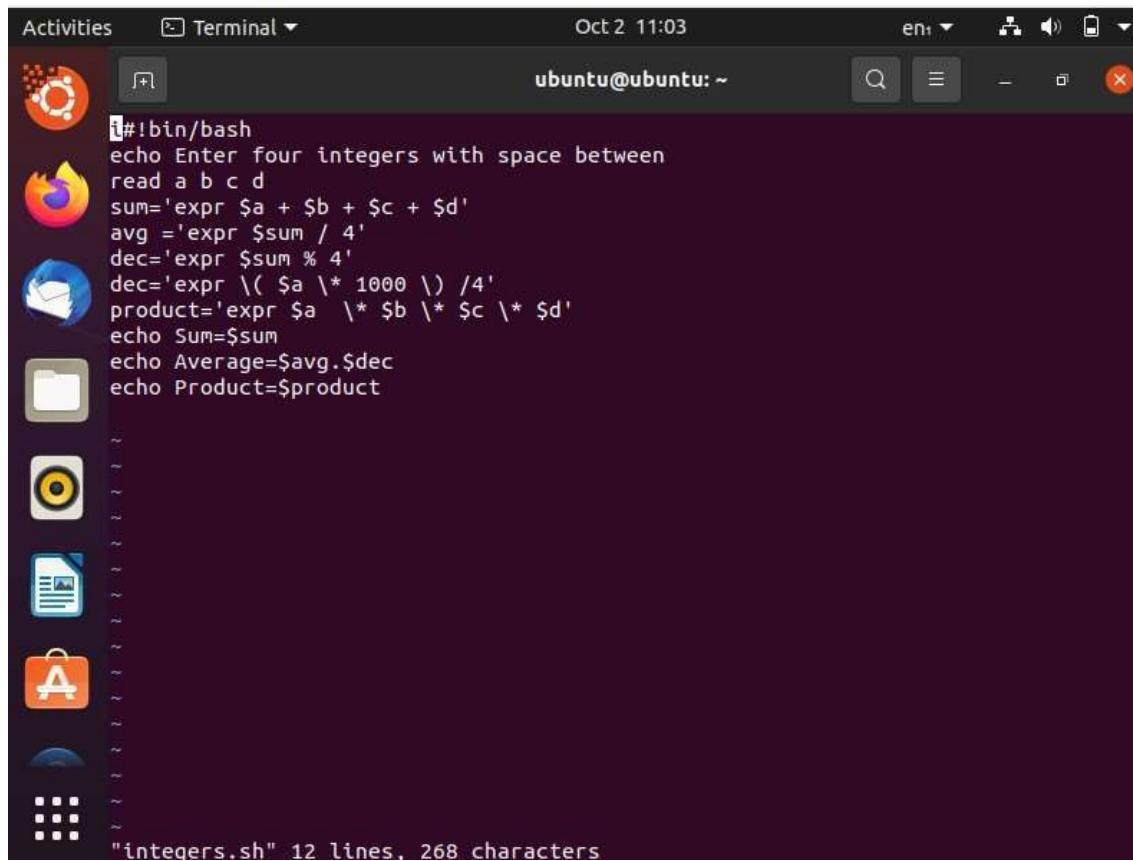
"first.sh" 14 lines, 152 characters

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

Activities Terminal Oct 2 11:02 en: ▾

ubuntu@ubuntu:~\$ vi integers.sh  
ubuntu@ubuntu:~\$ cat integers.sh  
#!/bin/bash  
echo Enter four integers with space between  
read a b c d  
sum='expr \$a + \$b + \$c + \$d'  
avg ='expr \$sum / 4'  
dec='expr \$sum % 4'  
dec='expr \(\$a \\* 1000 \) /4'  
product='expr \$a \\* \$b \\* \$c \\* \$d'  
echo Sum=\$sum  
echo Average=\$avg.\$dec  
echo Product=\$product

ubuntu@ubuntu:~\$ ls -l integers.sh  
-rw-rw-r-- 1 ubuntu ubuntu 268 Oct 2 10:59 integers.sh  
ubuntu@ubuntu:~\$ chmod +x integers.sh  
ubuntu@ubuntu:~\$ ls -l integers.sh  
-rwxrwxr-x 1 ubuntu ubuntu 268 Oct 2 10:59 integers.sh  
ubuntu@ubuntu:~\$ ./integers.sh  
. ./integers.sh: line 1: i#!bin/bash: No such file or directory  
Enter four integers with space between  
3  
. ./integers.sh: line 5: avg: command not found  
Sum=expr \$a + \$b + \$c + \$d  
Average=.expr \(\$a \\* 1000 \) /4  
Product=expr \$a \\* \$b \\* \$c \\* \$d  
ubuntu@ubuntu:~\$ █



A screenshot of a Ubuntu desktop environment. On the left, there's a dock with icons for the Dash, Home, Applications, and Dash to Dock. The main area shows a terminal window titled "Terminal". The terminal window has a dark background and contains the following text:

```
i#!bin/bash
echo Enter four integers with space between
read a b c d
sum='expr $a + $b + $c + $d'
avg ='expr $sum / 4'
dec='expr $sum % 4'
dec='expr \$a \(* 1000 \) /4'
product='expr $a \(* $b \(* $c \(* $d'
echo Sum=$sum
echo Average=$avg.$dec
echo Product=$product

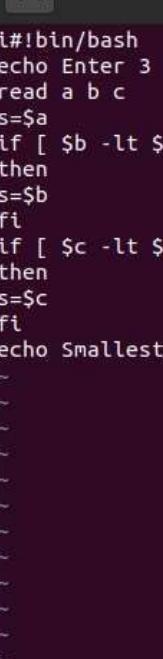
~
~
~
~
~
~
~
~
~
~
~
~
~
integers.sh" 12 lines, 268 characters
```

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

Activities Terminal Oct 2 11:12 en1

```
ubuntu@ubuntu:~$ vi small.sh
ubuntu@ubuntu:~$ cat small.sh
#!/bin/bash
echo Enter 3 numbers with spaces in between
read a b c
s=$a
if [ $b -lt $s ]
then
s=$b
fi
if [ $c -lt $s ]
then
s=$c
fi
echo Smallestof $a $b $c is $s
ubuntu@ubuntu:~$ ls -l small.sh
-rw-rw-r-- 1 ubuntu ubuntu 164 Oct  2 11:10 small.sh
ubuntu@ubuntu:~$ chmod +x small.sh
ubuntu@ubuntu:~$ ls -l small.sh
-rwxrwxr-x 1 ubuntu ubuntu 164 Oct  2 11:10 small.sh
ubuntu@ubuntu:~$ ./small.sh
./small.sh: line 1: i#!bin/bash: No such file or directory
Enter 3 numbers with spaces in between
3
./small.sh: line 5: [: -lt: unary operator expected
./small.sh: line 9: [: -lt: unary operator expected
Smallestof 3 is 3
ubuntu@ubuntu:~$ ./small.sh
./small.sh: line 1: i#!bin/bash: No such file or directory
```

Activities Terminal Oct 2 11:13 en1



```
i#!bin/bash
echo Enter 3 numbers with spaces in between
read a b c
s=$a
if [ $b -lt $s ]
then
s=$b
fi
if [ $c -lt $s ]
then
s=$c
fi
echo Smallest of $a $b $c is $s
```

~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~  
~

"small.sh" 13 lines, 164 characters

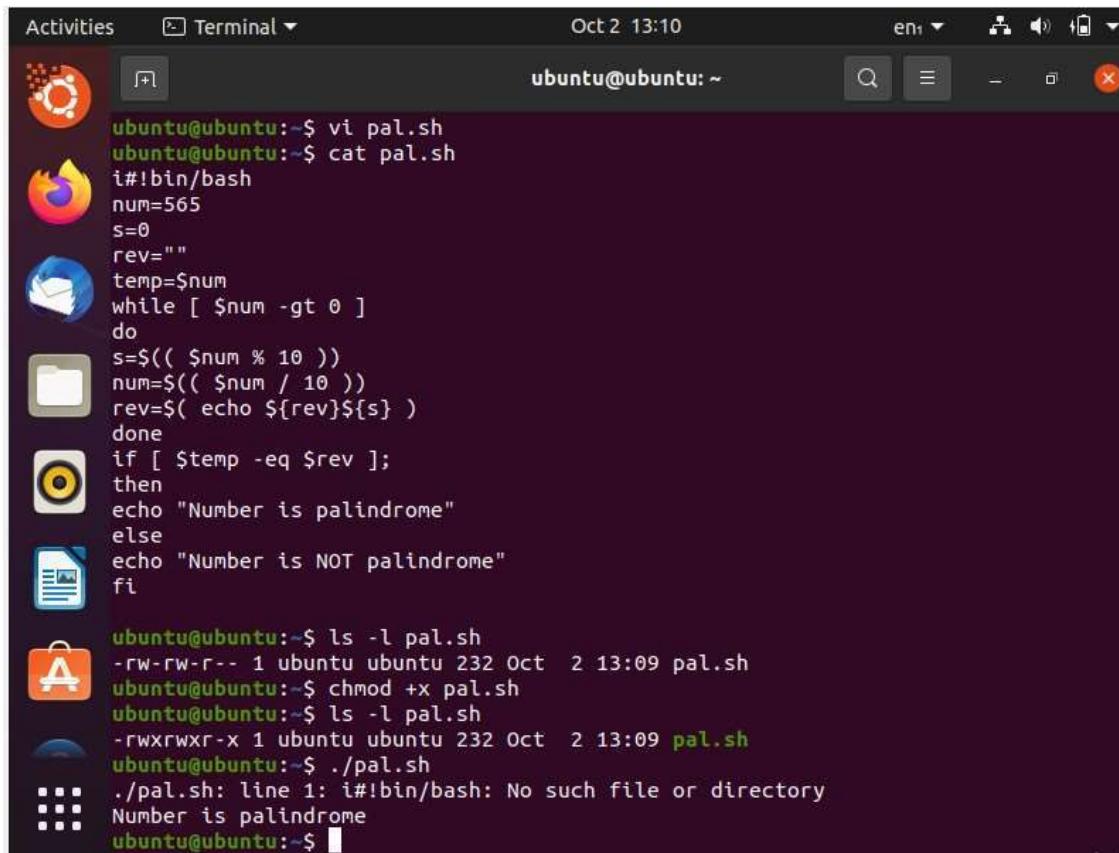
**11. Write a shell program to find factorial of given number.**

```
ubuntu@ubuntu:~$ vi fact.sh
ubuntu@ubuntu:~$ cat fact.sh
#!/bin/bash
echo "Enter a number"
read num
fact=1
while [ $num -gt 1 ]
do
fact=$((fact * num))
num=$((num -1))
done
echo $fact

ubuntu@ubuntu:~$ ls -l fact.sh
-rw-rw-r-- 1 ubuntu ubuntu 128 Oct  2 11:17 fact.sh
ubuntu@ubuntu:~$ chmod +x fact.sh
ubuntu@ubuntu:~$ ls -l fact.sh
-rwxrwxr-x 1 ubuntu ubuntu 128 Oct  2 11:17 fact.sh
ubuntu@ubuntu:~$ ./fact.sh
./fact.sh: line 1: i#!bin/bash: No such file or directory
Enter a number
6
720
ubuntu@ubuntu:~$
```

**"fact.sh"** 11 lines, 128 characters

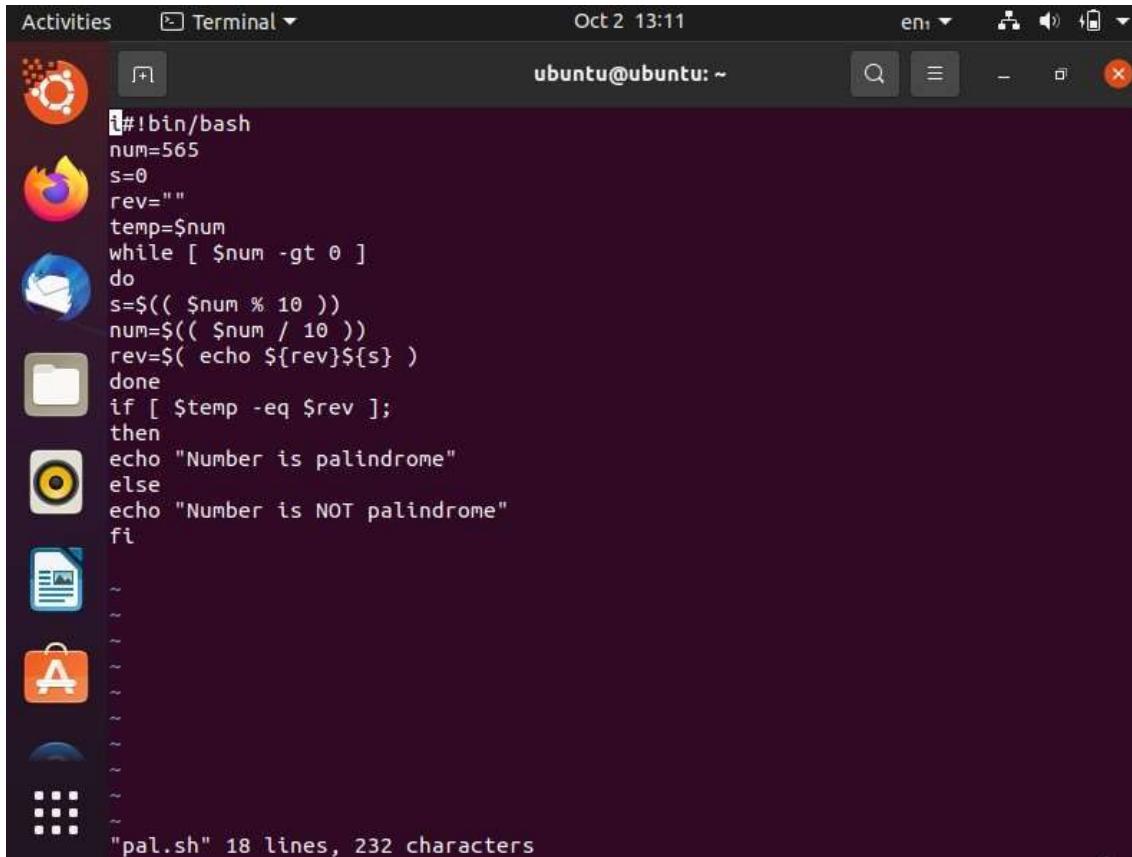
## 12. Write a shell program to check a number is palindrome or not.

A screenshot of a Ubuntu desktop environment. In the top left, there's a dock with icons for Dash, Home, Activities, and Terminal. The terminal window is open and shows the following session:

```
Activities Terminal Oct 2 13:10 en1
[+]
ubuntu@ubuntu:~$ vi pal.sh
ubuntu@ubuntu:~$ cat pal.sh
#!/bin/bash
num=565
s=0
rev=""
temp=$num
while [ $num -gt 0 ]
do
s=$(( $num % 10 ))
num=$(( $num / 10 ))
rev=$( echo ${rev}${s} )
done
if [ $temp -eq $rev ];
then
echo "Number is palindrome"
else
echo "Number is NOT palindrome"
fi

ubuntu@ubuntu:~$ ls -l pal.sh
-rw-rw-r-- 1 ubuntu ubuntu 232 Oct  2 13:09 pal.sh
ubuntu@ubuntu:~$ chmod +x pal.sh
ubuntu@ubuntu:~$ ls -l pal.sh
-rwxrwxr-x 1 ubuntu ubuntu 232 Oct  2 13:09 pal.sh
ubuntu@ubuntu:~$ ./pal.sh
./pal.sh: line 1: i#!bin/bash: No such file or directory
Number is palindrome
ubuntu@ubuntu:~$
```

The terminal window has a dark purple background with white text. Icons for various applications like Dash, Home, Activities, Terminal, Dash Home, Dash Activities, and a search bar are visible at the top.

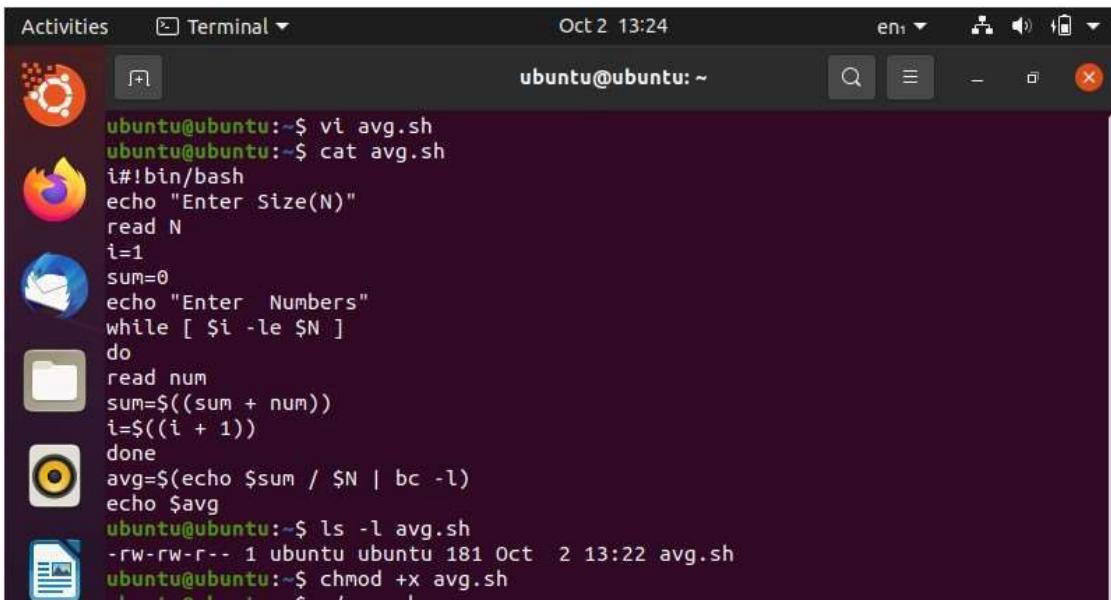


A screenshot of a Ubuntu desktop environment. A terminal window is open in the foreground, showing a shell script named 'pal.sh'. The script checks if a given number is a palindrome. The terminal window has a dark background with light-colored text. The title bar shows 'Activities' and 'Terminal'. The status bar at the bottom indicates the date and time as 'Oct 2 13:11'.

```
#!/bin/bash
num=565
s=0
rev=""
temp=$num
while [ $num -gt 0 ]
do
s=$(( $num % 10 ))
num=$(( $num / 10 ))
rev=$( echo ${rev}${s} )
done
if [ $temp -eq $rev ];
then
echo "Number is palindrome"
else
echo "Number is NOT palindrome"
fi
```

"pal.sh" 18 lines, 232 characters

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



A screenshot of a Ubuntu desktop environment. A terminal window is open in the foreground, showing a shell script named 'avg.sh'. The script prompts the user for the size of the array (N) and then for N numbers, calculates their sum, and prints the average. The terminal window has a dark background with light-colored text. The title bar shows 'Activities' and 'Terminal'. The status bar at the bottom indicates the date and time as 'Oct 2 13:24'.

```
ubuntu@ubuntu:~$ vi avg.sh
ubuntu@ubuntu:~$ cat avg.sh
#!/bin/bash
echo "Enter Size(N)"
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 $avg
ubuntu@ubuntu:~$ ls -l avg.sh
-rw-rw-r-- 1 ubuntu ubuntu 181 Oct  2 13:22 avg.sh
ubuntu@ubuntu:~$ chmod +x avg.sh
```

```
ubuntu@ubuntu:~$ ./avg.sh
./avg.sh: line 1: i#!/bin/bash: No such file or directory
Enter Size(N)
3
Enter Numbers
2
4
5
3.666666666666666666666666666666
ubuntu@ubuntu:~$
```

Activities Terminal Oct 2 13:26 en1

Install Ubuntu 20.04.2.0 LTS

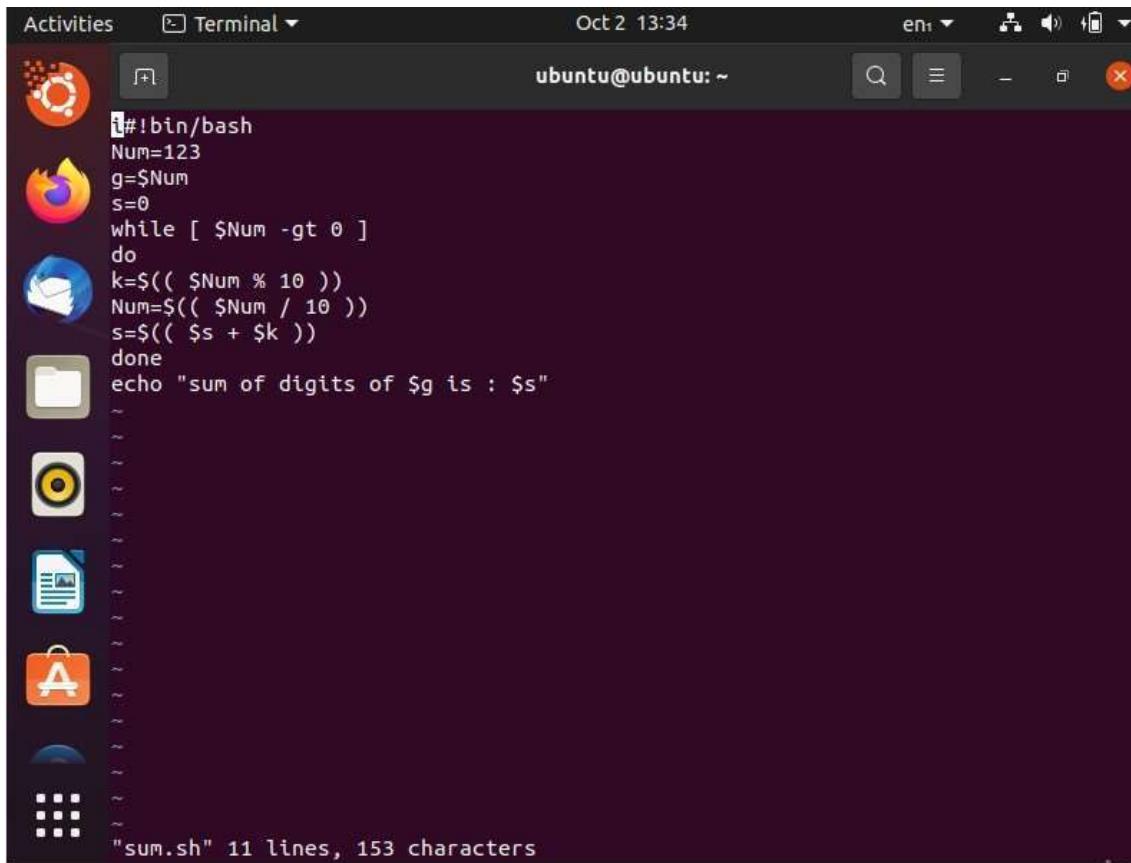
```
#!/bin/bash
echo "Enter Size(N)"
read N
i=1
sum=0
echo "Enter Numbers"
while [ $i -le $N ]
do
    read num
    sum=$((sum + num))
    i=$((i + 1))
done
avg=$(echo $sum / $N | bc -l)
echo $avg
```

"avg.sh" 14 lines, 181 characters

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

Activities Terminal Oct 2 13:33 eni

```
ubuntu@ubuntu:~$ vi sum.sh
ubuntu@ubuntu:~$ cat sum.sh
#!/bin/bash
Num=123
g=$Num
s=0
while [ $Num -gt 0 ]
do
k=$(( $Num % 10 ))
Num=$(( $Num / 10 ))
s=$(( $s + $k ))
done
echo "sum of digits of $g is : $s"
ubuntu@ubuntu:~$ ls -l sum.sh
-rw-rw-r-- 1 ubuntu ubuntu 153 Oct  2 13:32 sum.sh
ubuntu@ubuntu:~$ chmod +x sum.sh
ubuntu@ubuntu:~$ ls -l sum.sh
-rwxrwxr-x 1 ubuntu ubuntu 153 Oct  2 13:32 sum.sh
ubuntu@ubuntu:~$ ./sum.sh
./sum.sh: line 1: i#!bin/bash: No such file or directory
sum of digits of 123 is : 6
ubuntu@ubuntu:~$
```



A screenshot of an Ubuntu desktop environment. On the left, there's a dock with icons for the Dash, Terminal, Home, Applications, and Help. The main area shows a terminal window titled "Terminal". The terminal has a dark background and contains the following text:

```
#!/bin/bash
Num=123
g=$Num
s=0
while [ $Num -gt 0 ]
do
k=$(( $Num % 10 ))
Num=$(( $Num / 10 ))
s=$(( $s + $k ))
done
echo "sum of digits of $g is : $s"
~
```

The terminal window also displays the message "sum.sh" 11 lines, 153 characters at the bottom.

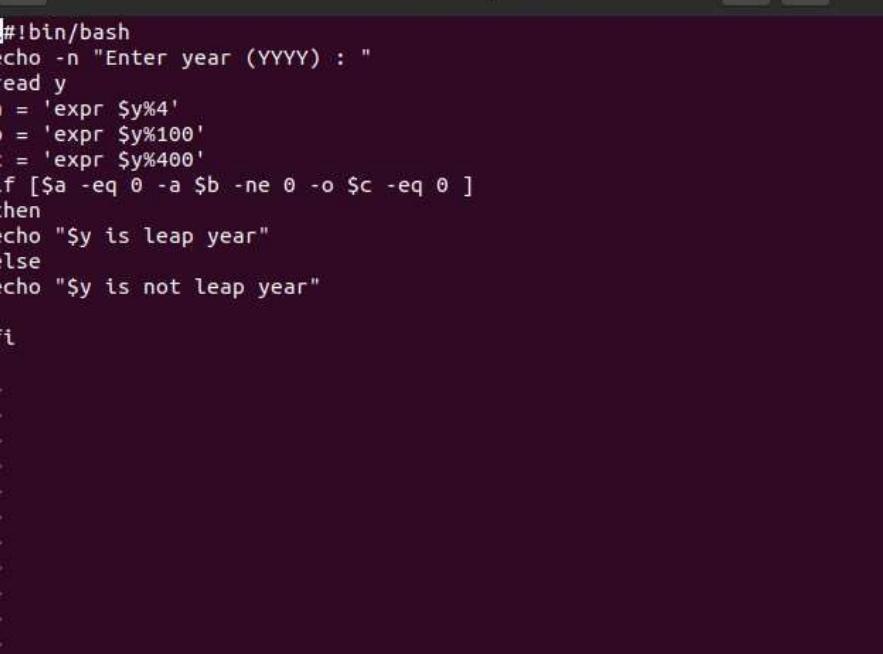
**15. Write a shell program to check whether given year is leap year or not.**

Activities Terminal Oct 2 13:46 en

```
ubuntu@ubuntu:~$ vi year.sh
ubuntu@ubuntu:~$ cat year.sh
#!/bin/bash
echo -n "Enter year (YYYY) : "
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

ubuntu@ubuntu:~$ ls -l year.sh
-rw-rw-r-- 1 ubuntu ubuntu 206 Oct  2 13:45 year.sh
ubuntu@ubuntu:~$ chmod +x year.sh
ubuntu@ubuntu:~$ ls -l year.sh
-rwxrwxr-x 1 ubuntu ubuntu 206 Oct  2 13:45 year.sh
ubuntu@ubuntu:~$ ./year.sh
./year.sh: line 1: i#!/bin/bash: No such file or directory
Enter year (YYYY) : 2024
./year.sh: line 4: a: command not found
./year.sh: line 5: b: command not found
./year.sh: line 6: c: command not found
./year.sh: line 7: [: too many arguments
2024 is not leap year
```

Activities Terminal Oct 2 13:47 en1



ubuntu@ubuntu: ~

```
#!/bin/bash
echo -n "Enter year (YYYY) : "
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
~
```

"year.sh" 14 lines, 206 characters