NETWORK LAB RECORD

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RMCA B 15

TABLE OF CONTENT

EXP NO	EXPERIMENT
1	BASIC LINUX COMMANDS
2	NETWORK COMMANDS
3	LAMP INSTALATION
4	ANSIBLE INSTALLATION
5	TCPDUMP
6	SHELL SCRIPTING
7	DOCKER INSTALLATION
8	WIRESHARK INSTALLATION

1. pwd — When you first open the terminal, you are in the home directory of your user. To know which directory you are in, you can use the **"pwd"** command. It gives us the absolute path, which means the path that starts from the root. The root is the base of the Linux file system. It is denoted by a forward slash(/). The user directory is usually something like "/home/username".

2. ls — Use the **"ls"** command to know what files are in the directory you are in. You can see all the hidden files by using the command **"ls -a"**.

3. cd — Use the **"cd"** command to go to a directory.

4. mkdir & rmdir — Use the **mkdir** command when you need to create a folder or a directory.Use **rmdir** to delete a directory. But **rmdir** can only be used to delete an empty directory. To delete a directory containing files, use **rm**.

5. rm - Use the **rm** command to delete files and directories

6. touch — The **touch** command is used to create a file. It can be anything, from an empty txt file to an empty zip file

7.Use the **cat** command to display the contents of a file. It is usually used to easily view programs.

Cat >> filename : append new content to existing content in a file.

Cat>filename: overwrite existing content in a file

8. man— To know more about a command and how to use it, use the **man** command. It shows the manual pages of the command. For example, "**man cd**" shows the manual pages of the **cd** command.

```
Applications  Places  System
Parrot Terminal
File  Edit  View  Search  Terminal  Help
┌─[roshan@parrot]─[~]
└──╼ $ls
abc.apk  Documents  materia-theme  Pictures  Public  Templates  wget-log
Desktop  Downloads  Music          poda.apk  Roshan  Videos     wget-log.1
┌─[roshan@parrot]─[~]
└──╼ $cd Desktop
┌─[roshan@parrot]─[~/Desktop]
└──╼ $cd Roshan
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $pwd
/home/roshan/Desktop/Roshan
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $mkdir new
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $cd new
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $pwd
/home/roshan/Desktop/Roshan/new
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $touch newfile
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $cat >> newfile
haii
hello
^C
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $cat >> newfile
hai everyone
^C
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $cat newfile
haii
hello
hai everyone
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $cat > newfile
new content
^C
```

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $cat newfile
new content
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $ls
newfile
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $ls -l
total 4
-rw-r--r-- 1 roshan roshan 12 Jun 14 14:22 newfile
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $ls -ld
drwxr-xr-x 1 roshan roshan 14 Jun 14 14:19 .
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $ls -a
.  ..  newfile
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $ls -lt
total 4
-rw-r--r-- 1 roshan roshan 12 Jun 14 14:22 newfile
┌─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $^C
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan/new]
└──╼ $history
```

BASIC LINUX COMMANDS

1. echo

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

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.

3. tail

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

4. read

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

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 do scroll up and down through the page.

6.less

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

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

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.

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.

10.cp

The cp command is used to copy files from the current directory to a different directory.

11.mv

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

12.locate

To locate a file, just like the search command in Windows.

13.find

Similar to the locate command, using find also searches for files and directories. The difference is, you use the find command to locate files within a given directory.

14.grep

Another basic Linux command that is undoubtedly helpful for everyday use is grep. It helps to search through all the text in a given file

15.df

Use df command to get a report on the system's disk space usage, shown in percentage and KBs. If you want to see the report in megabytes, type df -m.

16.du

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

- $du -h

17. useradd

The useradd is used to create a new user, while passwd is adding a password to that user's account. To add a new person named John type, useradd John and then to add his password type, passwd 123456789

18. userdel

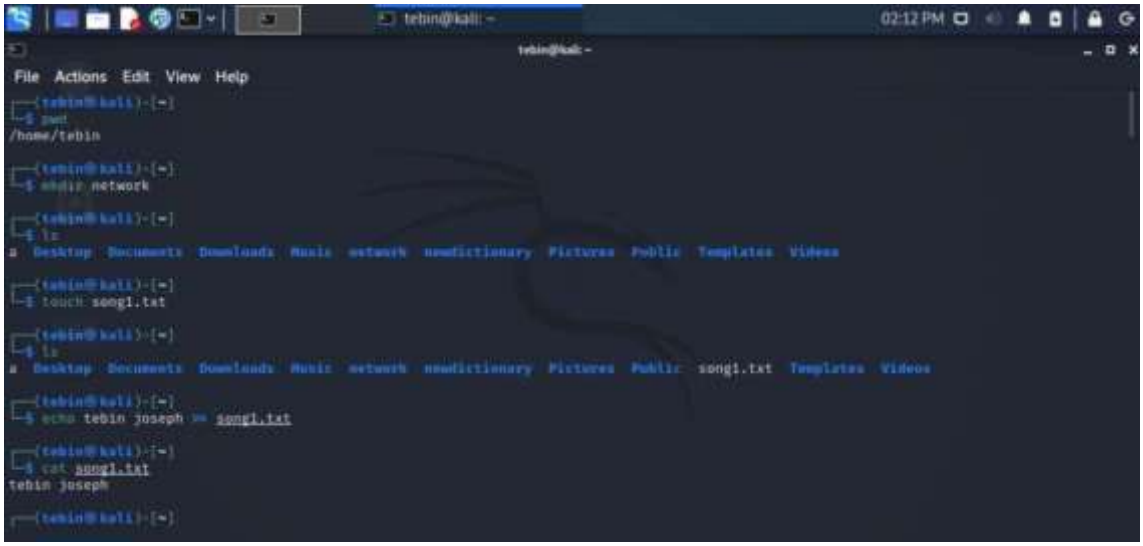
Remove a user is very similar to adding a new user. To delete the users account type, userdelUserName

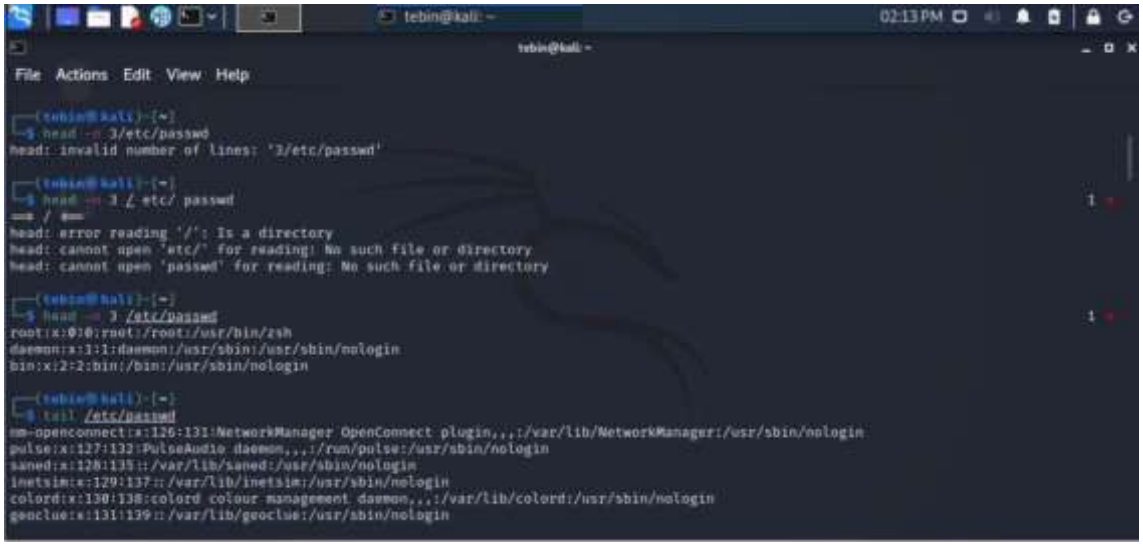
19. sudo

SuperUserDo(sudo) command enables you to perform tasks that require administrative or root permissions.

20. passwd

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





```
tebin@kali: ~
File  Actions  Edit  View  Help

┌──(tebin㉿kali)-[~]
└─$ read v1 v2 v3
amal jyothi college

┌──(tebin㉿kali)-[~]
└─$ echo ["$v3"] ["$v2"] ["$v1"]
a [jyothi] [college]

┌──(tebin㉿kali)-[~]
└─$ man more

┌──(tebin㉿kali)-[~]
└─$ more -d song1.txt
tebin joseph

┌──(tebin㉿kali)-[~]
└─$ echo cat >> song1.txt

┌──(tebin㉿kali)-[~]
└─$ more -d song1.txt
tebin joseph
cat

┌──(tebin㉿kali)-[~]
└─$ more /etc/passwd
```

```
tebin@kali: ~
File  Actions  Edit  View  Help
┌──(tebin㉿kali)-[~]
└─$ more /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
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
_apt:x:100:65534::/nonexistent:/usr/sbin/nologin
systemd-timesync:x:101:101:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
systemd-network:x:102:103:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:103:104:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
mysql:x:104:110:MySQL Server,,,:/nonexistent:/bin/false
tss:x:105:111:TPM software stack,,,:/var/lib/tpm:/bin/false
```

```
tebin@kali: ~
File  Actions  Edit  View  Help
└─$ less /etc/passwd

┌──(tebin㉿kali)-[~]
└─$ ls
a  Desktop  Documents  Downloads  Music  network  newdictionary  Pictures  Public  song1.txt  Templates  Videos

┌──(tebin㉿kali)-[~]
└─$ cut -b 1,2 song1.txt
te
ca

┌──(tebin㉿kali)-[~]
└─$ cut -b 1,2,3 song1.txt
teb
cat

┌──(tebin㉿kali)-[~]
└─$ cat >> number.txt
1
2
3
^C

┌──(tebin㉿kali)-[~]
└─$ paste number.txt song.txt                                          130 ×
paste: song.txt: No such file or directory
```

```
tebin@kali: ~
File  Actions  Edit  View  Help
┌──(tebin㉿kali)-[~]
└─$ paste number.txt song1.txt
1       tebin jusoph
2       cat
3

┌──(tebin㉿kali)-[~]
└─$ uname
Linux

┌──(tebin㉿kali)-[~]
└─$ uname -r
5.10.0-kali7-amd64

┌──(tebin㉿kali)-[~]
└─$ uname -v
#1 SMP Debian 5.10.28-1kali1 (2021-04-12)

┌──(tebin㉿kali)-[~]
└─$ uname -o
unknown

┌──(tebin㉿kali)-[~]
└─$ touch v1.txt v2.txt

┌──(tebin㉿kali)-[~]
```

```
tebin@kali: ~
File  Actions  Edit  View  Help

┌──(tebin㉿kali)-[~]
└─$ cp v1.txt ajce/

┌──(tebin㉿kali)-[~]
└─$ ls ajce
v1.txt

┌──(tebin㉿kali)-[~]
└─$ cp v2.txt ajce/

┌──(tebin㉿kali)-[~]
└─$ mv v1.txt ajce/

┌──(tebin㉿kali)-[~]
└─$ ls ajce
v1.txt  v2.txt

┌──(tebin㉿kali)-[~]
└─$ ls
a     Desktop    Downloads  network        number.txt  Public     Templates  Videos
ajce  Documents  Music      newdictionary  Pictures    song1.txt  v2.txt

┌──(tebin㉿kali)-[~]
└─$ locate song1.txt
```

```
tebin@kali: ~
File  Actions  Edit  View  Help
└─$ du -a
4.0K    ./Music
4.0K    ./Public
332K    ./Pictures
4.0K    ./Downloads
4.0K    ./Desktop
12K     ./.cache/fontconfig
4.0K    ./.cache/mesa_shader_cache
8.0K    ./.cache/mozilla/firefox/5kgb49cc.default-esr/cache2/doomed
5.2M    ./.cache/mozilla/firefox/5kgb49cc.default-esr/cache2/entries
5.2M    ./.cache/mozilla/firefox/5kgb49cc.default-esr/cache2
7.9M    ./.cache/mozilla/firefox/5kgb49cc.default-esr/safebrowsing/google4
9.9M    ./.cache/mozilla/firefox/5kgb49cc.default-esr/safebrowsing
12K     ./.cache/mozilla/firefox/5kgb49cc.default-esr/settings/main/ms-language-packs
16K     ./.cache/mozilla/firefox/5kgb49cc.default-esr/settings/main
20K     ./.cache/mozilla/firefox/5kgb49cc.default-esr/settings
260K    ./.cache/mozilla/firefox/5kgb49cc.default-esr/OfflineCache
15M     ./.cache/mozilla/firefox/5kgb49cc.default-esr/startupCache
24K     ./.cache/mozilla/firefox/5kgb49cc.default-esr/thumbnails
31M     ./.cache/mozilla/firefox/5kgb49cc.default-esr
4.0K    ./.cache/mozilla/firefox/nnvgty4b.default
31M     ./.cache/mozilla/firefox
31M     ./.cache/mozilla
4.0K    ./.cache/obexd
436K    ./.cache/samba
8.0K    ./.cache/sessions/thumbs-kali:0
```

```
tebin@kali: ~
File  Actions  Edit  View  Help
404K    ./.local/share
408K    ./.local
50M     .

┌──(tebin㉿kali)-[~]
└─$ useradd solomon
useradd: Permission denied.
useradd: cannot lock /etc/passwd; try again later.

┌──(tebin㉿kali)-[~]
└─$ sudo useradd solomon
[sudo] password for tebin:
Sorry, try again.
[sudo] password for tebin:

┌──(tebin㉿kali)-[~]
└─$ sudo passwd solomon
New password:
Retype new password:
passwd: password updated successfully

┌──(tebin㉿kali)-[~]
└─$ sudo userdel solomon

┌──(tebin㉿kali)-[~]
└─$
```

Kanjirapally

1. usermod

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

2. groupadd

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

3. groups

print the groups a user is in.

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

```
┌─[roshan@parrot]─[~]
└──╼ $sudo groupdel sj
┌─[roshan@parrot]─[~]
└──╼ $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:roshan
fax:x:21:
voice:x:22:
cdrom:x:24:roshan
floppy:x:25:roshan
tape:x:26:
sudo:x:27:roshan
audio:x:29:pulse,roshan
dip:x:30:roshan
www-data:x:33:
backup:x:34:
```

5. groupmod

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

```
┌─[roshan@parrot]─[~]
└──╼ $sudo groupadd lavender
┌─[roshan@parrot]─[~]
└──╼ $groups
roshan dialout cdrom floppy sudo audio dip video plugdev netdev debian-tor bluetooth scanner
┌─[roshan@parrot]─[~]
└──╼ $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:roshan
fax:x:21:
voice:x:22:
cdrom:x:24:roshan
floppy:x:25:roshan
tape:x:26:
sudo:x:27:roshan
```

```
┌─[roshan@parrot]─[~]
└──╼ $tail /etc/group
dradis:x:149:
beef-xss:x:150:
geoclue:x:151:
lightdm:x:152:
kpadmins:x:153:
roshan:x:1000:
systemd-coredump:x:999:
irence:x:1001:
irene:x:1002:
lavender:x:1003:
```

```
┌─[roshan@parrot]─[~]
└──╼ $sudo groupmod -n HH lavender
┌─[roshan@parrot]─[~]
└──╼ $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:roshan
fax:x:21:
voice:x:22:
cdrom:x:24:roshan
floppy:x:25:roshan
tape:x:26:
sudo:x:27:roshan
audio:x:29:pulse,roshan
```

6. chmod

To change directory permissions of file/ Directory in Linux.

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.

```
┌─[roshan@parrot]─[~]
└──╼ $chmod u+x state.txt
┌─[roshan@parrot]─[~]
```

7. chown

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

```
┌─[✗]─[roshan@parrot]─[~]
└──╼ $chown roshan state.txt
┌─[roshan@parrot]─[~]
└──╼ $ls -l state.txt
-rwxr--r-- 1 roshan roshan 0 Aug 13 02:10 state.txt
┌─[roshan@parrot]─[~]
```

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

```
┌─[roshan@parrot]─[~]
└──╼ $id
uid=1000(roshan) gid=1000(roshan) groups=1000(roshan),20(dialout),24(cdrom),25(floppy),27(sudo)
29(audio),30(dip),44(video),46(plugdev),109(netdev),119(debian-tor),125(bluetooth),139(scanner

┌─[roshan@parrot]─[~]
└──╼ $
```

9. 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.

```
┌─[roshan@parrot]─[~]
└──╼ $ps -u
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
roshan    1592  0.0  0.0   8120  4932 pts/0    Ss   01:52   0:00 bash
roshan    2377  0.0  0.0  10836  3264 pts/0    R+   02:16   0:00 ps -u
┌─[roshan@parrot]─[~]
└──╼ $
```

10. top top command is used to show the Linux processes. It provides a dynamic real-time view of the running system.

```
┌─[roshan@parrot]─[~]
└──╼ $top

top - 02:18:21 up 32 min,  1 user,  load average: 0.12, 0.09, 0.08
Tasks: 164 total,   1 running, 163 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.1 us,  0.1 sy,  0.0 ni, 99.8 id,  0.0 wa,  0.0 hi,  0.1 si,  0.0 st
MiB Mem :   4995.6 total,   3764.1 free,    466.9 used,    764.7 buff/cache
MiB Swap:      0.0 total,      0.0 free,      0.0 used.   4276.9 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
  751 root      20   0  646320 121372  47680 S   0.7   2.4   0:13.50 Xorg
 1584 roshan    20   0  490380  44376  32344 S   0.7   0.9   0:02.37 mate-terminal
  337 root      20   0   42312  16964  15492 S   0.3   0.3   0:02.09 systemd-journal
    1 root      20   0  169412  10380   7900 S   0.0   0.2   0:04.89 systemd
    2 root      20   0       0      0      0 S   0.0   0.0   0:00.01 kthreadd
    3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
    4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
    6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-kblockd
    8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
    9 root      20   0       0      0      0 S   0.0   0.0   0:00.03 ksoftirqd/0
   10 root      20   0       0      0      0 I   0.0   0.0   0:00.25 rcu_sched
   11 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_bh
   12 root      rt   0       0      0      0 S   0.0   0.0   0:00.01 migration/0
   14 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
   15 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
   16 root      rt   0       0      0      0 S   0.0   0.0   0:00.00 migration/1
   17 root      20   0       0      0      0 S   0.0   0.0   0:00.03 ksoftirqd/1
   19 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-kblockd
   20 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/2
   21 root      rt   0       0      0      0 S   0.0   0.0   0:00.01 migration/2
   22 root      20   0       0      0      0 S   0.0   0.0   0:00.02 ksoftirqd/2
   24 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/2:0H-kblockd
   25 root      20   0       0      0      0 S   0.0   0.0   0:00.00 cpuhp/3
```

Kanjirapally

1. **wc** wc stands for word count. Used for counting purpose.

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

2. **tar**

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

   Linux tar command to create compressed or uncompressed Archive files.

3. expr

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

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

```
┌─[roshan@parrot]─[~]
└──╼ $expr 10 + 2
12
┌─[roshan@parrot]─[~]
└──╼ $
```

4. Redirections & Piping

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

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

5. ssh

- ssh stands for "Secure Shell".
- It is a protocol used to securely connect to a remote server/system.
- ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.

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

6. 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.

7. 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.

```
┌─[roshan@parrot]─[~]
└──╼ $ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/roshan/.ssh/id_rsa): hub
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Passphrases do not match.  Try again.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in hub.
Your public key has been saved in hub.pub.
The key fingerprint is:
SHA256:1SLC2R2mszpOk8yM2Tu2Cm/wtr4jYobAkABlAsvQFvQ roshan@parrot
The key's randomart image is:
+---[RSA 2048]----+
|B+=.       o     |
|++o. . o + o     |
|o+  E + = + .    |
|o       . = .    |
|o        S       |
|...   B o        |
|o .oo @          |
|oo.o=oo+         |
|o. =**+o         |
+----[SHA256]-----+
┌─[roshan@parrot]─[~]
└──╼ $
```

8. **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

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $touch song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

   b) Create six files with name of the form snapX.mp3

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $touch snap1.jpg snap2.jpg snap3.jpg snap3.jpg snap4.jpg snap5.jpg snap6.jpg
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

   c) Create six files with name of the form filmX.mp3

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $touch film1.mp4 film2.mp4 film3.mp4 film4.mp4 film5.mp4 film6.mp4
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $mv *.mp3 ./music/
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $mv *.jpg ./pictures/
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $mv *.mp4 ./videos/
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $mkdir -p {friends,family,work}
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan/music]
└──╼ $cp song1.mp3  song2.mp3  song3.mp3  song4.mp3  song5.mp3  song6.mp3 /home/roshan/Desktop/R
oshan/friends
┌─[roshan@parrot]─[~/Desktop/Roshan/music]
└──╼ $
```

```
┌─[roshan@parrot]─[~/Desktop/Roshan/pictures]
└──╼ $ls
snap1.jpg  snap2.jpg  snap3.jpg  snap4.jpg  snap5.jpg  snap6.jpg
┌─[roshan@parrot]─[~/Desktop/Roshan/pictures]
└──╼ $ \cp snap1.jpg  snap2.jpg  snap3.jpg  snap4.jpg  snap5.jpg  snap6.jpg /hom
e/roshan/Desktop/Roshan/family
┌─[roshan@parrot]─[~/Desktop/Roshan/pictures]
└──╼ $
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $rmdir friends family
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $rm -r friends family
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $ls -a > allfiles.txt
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $date
Tue 17 Aug 2021 11:54:42 AM EDT
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

9. Add the user Juliet

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo useradd juliet
[sudo] password for roshan:
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $cat /etc/passwd | grep juliet
juliet:x:2001:2001::/home/juliet:/bin/sh
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo passwd juliet
New password:
Retype new password:
passwd: password updated successfully
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo groupadd -g 30000 shakespheare
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

13. Create a supplementary group called artists

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo groupadd artists
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $less /etc/group
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo usermod -G shakespheare juliet
[sudo] password for roshan:
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $id juliet
uid=2001(juliet) gid=2001(juliet) groups=2001(juliet),30000(shakespheare)
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

17. Add Romeo and Hamlet to the Shakespeare group.

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo useradd romeo
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo hamet
sudo: hamet: command not found
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo useradd hamlet
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo usermod -G shakespheare romeo
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo usermod -G shakespheare hamlet
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[✗]─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo useradd reba
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo useradd dolly
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo useradd elvis
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo usermod -G artists reba
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo usermod -G artists dolly
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo usermod -G artists elvis
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $less /etc/group
```

20. Attempt to remove user Dolly.

```
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $sudo userdel dolly
┌─[roshan@parrot]─[~/Desktop/Roshan]
└──╼ $
```

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

Windows

- Ping

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.19043.1202]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\system32>ping google.com

Pinging google.com [142.250.196.78] with 32 bytes of data:
Reply from 142.250.196.78: bytes=32 time=45ms TTL=119
Reply from 142.250.196.78: bytes=32 time=45ms TTL=119
Reply from 142.250.196.78: bytes=32 time=47ms TTL=119
Reply from 142.250.196.78: bytes=32 time=20ms TTL=119

Ping statistics for 142.250.196.78:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 47ms, Average = 39ms

C:\Windows\system32>ping -a google.com

Pinging google.com [142.250.196.78] with 32 bytes of data:
Reply from 142.250.196.78: bytes=32 time=37ms TTL=119
Reply from 142.250.196.78: bytes=32 time=21ms TTL=119
Reply from 142.250.196.78: bytes=32 time=20ms TTL=119
Reply from 142.250.196.78: bytes=32 time=31ms TTL=119

Ping statistics for 142.250.196.78:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 37ms, Average = 27ms
```

```
C:\Windows\system32>ping -t google.com

Pinging google.com [142.250.196.78] with 32 bytes of data:
Reply from 142.250.196.78: bytes=32 time=34ms TTL=119
Reply from 142.250.196.78: bytes=32 time=21ms TTL=119
Reply from 142.250.196.78: bytes=32 time=23ms TTL=119
Reply from 142.250.196.78: bytes=32 time=24ms TTL=119
Reply from 142.250.196.78: bytes=32 time=29ms TTL=119
Reply from 142.250.196.78: bytes=32 time=33ms TTL=119
Reply from 142.250.196.78: bytes=32 time=41ms TTL=119

Ping statistics for 142.250.196.78:
    Packets: Sent = 7, Received = 7, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 21ms, Maximum = 41ms, Average = 29ms
```

```
C:\Windows\system32>ping -j google.com

Pinging google.com [142.250.196.78] with 32 bytes of data:
General failure.
General failure.
General failure.
General failure.

Ping statistics for 142.250.196.78:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Windows\system32>ping -4 google.com

Pinging google.com [142.250.196.78] with 32 bytes of data:
Reply from 142.250.196.78: bytes=32 time=25ms TTL=119
Reply from 142.250.196.78: bytes=32 time=20ms TTL=119
Reply from 142.250.196.78: bytes=32 time=20ms TTL=119
Reply from 142.250.196.78: bytes=32 time=21ms TTL=119

Ping statistics for 142.250.196.78:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 20ms, Maximum = 25ms, Average = 21ms
```

- Route

```
Administrator: Command Prompt
    Minimum = 20ms, Maximum = 25ms, Average = 21ms

C:\Windows\system32>route print
===========================================================================
Interface List
  2...0a 00 27 00 00 02 ......VirtualBox Host-Only Ethernet Adapter
 25...1a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #5
 19...2a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #6
 23...18 47 3d e9 62 5d ......Qualcomm QCA61x4A 802.11ac Wireless Adapter
 10...18 47 3d e9 62 5e ......Bluetooth Device (Personal Area Network) #2
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0      192.168.1.1      192.168.1.2     40
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    331
        127.0.0.1  255.255.255.255         On-link         127.0.0.1    331
  127.255.255.255  255.255.255.255         On-link         127.0.0.1    331
      192.168.1.0    255.255.255.0         On-link       192.168.1.2    296
      192.168.1.2  255.255.255.255         On-link       192.168.1.2    296
    192.168.1.255  255.255.255.255         On-link       192.168.1.2    296
     192.168.56.0    255.255.255.0         On-link      192.168.56.1    281
     192.168.56.1  255.255.255.255         On-link      192.168.56.1    281
   192.168.56.255  255.255.255.255         On-link      192.168.56.1    281
        224.0.0.0        240.0.0.0         On-link         127.0.0.1    331
        224.0.0.0        240.0.0.0         On-link      192.168.56.1    281
        224.0.0.0        240.0.0.0         On-link       192.168.1.2    296
  255.255.255.255  255.255.255.255         On-link         127.0.0.1    331
  255.255.255.255  255.255.255.255         On-link      192.168.56.1    281
  255.255.255.255  255.255.255.255         On-link       192.168.1.2    296
===========================================================================
Persistent Routes:
  None
```

```
IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    331 ::1/128                  On-link
  2    281 fe80::/64                On-link
 23    296 fe80::/64                On-link
 23    296 fe80::3967:1de3:1924:1daf/128
                                    On-link
  2    281 fe80::e866:65b:18f5:53de/128
                                    On-link
  1    331 ff00::/8                 On-link
  2    281 ff00::/8                 On-link
 23    296 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None
```

```
C:\Windows\system32>route print -4
===========================================================================
Interface List
  2...0a 00 27 00 00 02 ......VirtualBox Host-Only Ethernet Adapter
 25...1a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #5
 19...2a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #6
 23...18 47 3d e9 62 5d ......Qualcomm QCA61x4A 802.11ac Wireless Adapter
 10...18 47 3d e9 62 5e ......Bluetooth Device (Personal Area Network) #2
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway       Interface  Metric
          0.0.0.0          0.0.0.0      192.168.1.1      192.168.1.2     40
        127.0.0.0        255.0.0.0         On-link         127.0.0.1    331
        127.0.0.1  255.255.255.255         On-link         127.0.0.1    331
  127.255.255.255  255.255.255.255         On-link         127.0.0.1    331
      192.168.1.0    255.255.255.0         On-link       192.168.1.2    296
      192.168.1.2  255.255.255.255         On-link       192.168.1.2    296
    192.168.1.255  255.255.255.255         On-link       192.168.1.2    296
     192.168.56.0    255.255.255.0         On-link      192.168.56.1    281
     192.168.56.1  255.255.255.255         On-link      192.168.56.1    281
   192.168.56.255  255.255.255.255         On-link      192.168.56.1    281
        224.0.0.0        240.0.0.0         On-link         127.0.0.1    331
        224.0.0.0        240.0.0.0         On-link      192.168.56.1    281
        224.0.0.0        240.0.0.0         On-link       192.168.1.2    296
  255.255.255.255  255.255.255.255         On-link         127.0.0.1    331
  255.255.255.255  255.255.255.255         On-link      192.168.56.1    281
  255.255.255.255  255.255.255.255         On-link       192.168.1.2    296
===========================================================================
Persistent Routes:
  None
```

```
C:\Windows\system32>route print -6
===========================================================================
Interface List
  2...0a 00 27 00 00 02 ......VirtualBox Host-Only Ethernet Adapter
 25...1a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #5
 19...2a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #6
 23...18 47 3d e9 62 5d ......Qualcomm QCA61x4A 802.11ac Wireless Adapter
 10...18 47 3d e9 62 5e ......Bluetooth Device (Personal Area Network) #2
  1...........................Software Loopback Interface 1
===========================================================================

IPv6 Route Table
===========================================================================
Active Routes:
 If Metric Network Destination      Gateway
  1    331 ::1/128                  On-link
  2    281 fe80::/64                On-link
 23    296 fe80::/64                On-link
 23    296 fe80::3967:1de3:1924:1daf/128
                                    On-link
  2    281 fe80::e866:65b:18f5:53de/128
                                    On-link
  1    331 ff00::/8                 On-link
  2    281 ff00::/8                 On-link
 23    296 ff00::/8                 On-link
===========================================================================
Persistent Routes:
  None
```

```
C:\Windows\system32>route print *153
===========================================================================
Interface List
  2...0a 00 27 00 00 02 ......VirtualBox Host-Only Ethernet Adapter
 25...1a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #5
 19...2a 47 3d e9 62 5d ......Microsoft Wi-Fi Direct Virtual Adapter #6
 23...18 47 3d e9 62 5d ......Qualcomm QCA61x4A 802.11ac Wireless Adapter
 10...18 47 3d e9 62 5e ......Bluetooth Device (Personal Area Network) #2
  1...........................Software Loopback Interface 1
===========================================================================

IPv4 Route Table
===========================================================================
Active Routes:
  None
Persistent Routes:
  None

IPv6 Route Table
===========================================================================
Active Routes:
  None
Persistent Routes:
  None
```

- Tracert

```
C:\Windows\system32>tracert 192.168.1.2

Tracing route to KAJ [192.168.1.2]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  KAJ [192.168.1.2]

Trace complete.

C:\Windows\system32>tracert 192.168.1.1

Tracing route to 192.168.1.1 over a maximum of 30 hops

  1     8 ms     2 ms     2 ms  192.168.1.1

Trace complete.
```

```
C:\Windows\system32>tracert 22.110.0.1

Tracing route to 22.110.0.1 over a maximum of 30 hops

  1    18 ms     2 ms     2 ms  192.168.1.1
  2    22 ms     6 ms     5 ms  100.76.0.1
  3    66 ms    79 ms    80 ms  125.23.238.89
  4   249 ms   258 ms   250 ms  116.119.52.163
  5   242 ms   232 ms   257 ms  10gigabitethernet1-2.core1.nyc6.he.net [198.32.160.61]
  6   234 ms   240 ms   254 ms  100ge13-1.core1.nyc4.he.net [184.105.64.177]
  7   265 ms   255 ms   252 ms  100ge16-1.core1.ash1.he.net [184.105.223.165]
  8   223 ms   227 ms   238 ms  100ge5-1.core2.ash1.he.net [72.52.92.226]
  9     *        *        *     Request timed out.
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14     *        *        *     Request timed out.
 15     *        *        *     Request timed out.
 16     *        *        *     Request timed out.
 17     *        *        *     Request timed out.
 18     *        *        *     Request timed out.
 19     *        *        *     Request timed out.
 20     *        *        *     Request timed out.
 21     *        *        *     Request timed out.
 22     *        *        *     Request timed out.
 23     *        *        *     Request timed out.
 24     *        *        *     Request timed out.
 25     *        *        *     Request timed out.
 26     *        *        *     Request timed out.
 27     *        *        *     Request timed out.
 28     *        *        *     Request timed out.
 29     *        *        *     Request timed out.
 30     *        *        *     Request timed out.

Trace complete.
```

```
C:\Windows\system32>tracert google.com

Tracing route to google.com [142.250.193.142]
over a maximum of 30 hops:

  1     6 ms     2 ms     2 ms  192.168.1.1
  2     5 ms     6 ms     5 ms  100.76.0.1
  3    39 ms    21 ms    20 ms  10.1.3.10
  4    22 ms    31 ms    20 ms  72.14.205.178
  5    33 ms    25 ms    54 ms  216.239.54.75
  6    21 ms    37 ms    23 ms  142.251.55.227
  7    21 ms    21 ms    36 ms  maa05s25-in-f14.1e100.net [142.250.193.142]

Trace complete.
```

```
C:\Windows\system32>tracert -d www.linkedin.com

Tracing route to l-0005.l-msedge.net [13.107.42.14]
over a maximum of 30 hops:

  1     4 ms     3 ms     3 ms  192.168.1.1
  2     5 ms     6 ms     6 ms  100.76.0.1
  3    21 ms    45 ms    21 ms  10.1.3.14
  4    20 ms    22 ms    43 ms  104.44.6.123
  5    28 ms    34 ms    21 ms  104.44.41.233
  6    21 ms    30 ms    29 ms  104.44.22.123
  7    45 ms    24 ms    56 ms  104.44.18.159
  8    62 ms    29 ms    49 ms  104.44.23.248
  9    21 ms    38 ms    22 ms  104.44.234.36
 10    23 ms    20 ms    37 ms  13.104.182.49
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *        *        *     Request timed out.
 14    63 ms    30 ms     *     13.107.42.14
 15    21 ms    51 ms    21 ms  13.107.42.14

Trace complete.
```

- Nslookup

```
C:\Windows\system32>nslookup
Default Server:  UnKnown
Address:  103.140.17.242

> exit

C:\Windows\system32>nslookup google.com
Server:  UnKnown
Address:  103.140.17.242

Non-authoritative answer:
Name:    google.com
Addresses:  2404:6800:4007:82b::200e
          142.250.196.78


C:\Windows\system32>nslookup -q=MX google.com
Server:  UnKnown
Address:  103.140.17.242

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

C:\Windows\system32>nslookup -type=ns google.com
Server:  UnKnown
Address:  103.140.17.242

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

- Ipconfig

```
C:\Windows\system32>ipconfig

Windows IP Configuration


Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e866:65b:18f5:53de%2
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 13:

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

Wireless LAN adapter Local Area Connection* 14:

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

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3967:1de3:1924:1daf%23
   IPv4 Address. . . . . . . . . . . : 192.168.1.2
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection 2:

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

```
C:\Windows\system32>ipconfig /allcompartments

Windows IP Configuration


============================================================================
Network Information for Compartment 1 (ACTIVE)
============================================================================

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e866:65b:18f5:53de%2
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 13:

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

Wireless LAN adapter Local Area Connection* 14:

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

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3967:1de3:1924:1daf%23
   IPv4 Address. . . . . . . . . . . : 192.168.1.2
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection 2:
```

```
C:\Windows\system32>ipconfig/displaydns

Windows IP Configuration

    www.wondershare.com
    ----------------------------------------
    No records of type AAAA


    www.wondershare.com
    ----------------------------------------
    Record Name . . . . . : www.wondershare.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 483101
    Data Length . . . . . : 4
    Section . . . . . : Answer
    A (Host) Record . . . : 127.0.0.1


    cbs.wondershare.com
    ----------------------------------------
    No records of type AAAA


    cbs.wondershare.com
    ----------------------------------------
    Record Name . . . . . : cbs.wondershare.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 483101
    Data Length . . . . . : 4
    Section . . . . . : Answer
    A (Host) Record . . . : 127.0.0.1


    tracker.openbittorrent.com
    ----------------------------------------
    Record Name . . . . . : tracker.openbittorrent.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 389
    Data Length . . . . . : 4
    Section . . . . . : Answer
    A (Host) Record . . . : 45.154.253.5


    Record Name . . . . . : tracker.openbittorrent.com
    Record Type . . . . . : 1
    Time To Live  . . . . : 389
    Data Length . . . . . : 4
```

```
C:\Windows\system32>ipconfig/release

Windows IP Configuration

No operation can be performed on Local Area Connection* 13 while it has its media disconnected.
No operation can be performed on Local Area Connection* 14 while it has its media disconnected.
No operation can be performed on Bluetooth Network Connection 2 while it has its media disconnected.

Ethernet adapter VirtualBox Host-Only Network:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::e866:65b:18f5:53de%2
   IPv4 Address. . . . . . . . . . . : 192.168.56.1
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . :

Wireless LAN adapter Local Area Connection* 13:

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

Wireless LAN adapter Local Area Connection* 14:

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

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::3967:1de3:1924:1daf%23
   Default Gateway . . . . . . . . . :

Ethernet adapter Bluetooth Network Connection 2:

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

C:\Windows\system32>
```

- Netstat

```
C:\Windows\system32>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:19575        platform:50181         TIME_WAIT
  TCP    127.0.0.1:19575        platform:51946         TIME_WAIT
  TCP    127.0.0.1:19575        platform:53545         TIME_WAIT
  TCP    127.0.0.1:19575        platform:54604         TIME_WAIT
  TCP    127.0.0.1:19575        platform:55679         TIME_WAIT
  TCP    127.0.0.1:19575        platform:55970         TIME_WAIT
  TCP    127.0.0.1:19575        platform:57517         TIME_WAIT
  TCP    127.0.0.1:19575        platform:61464         TIME_WAIT
  TCP    127.0.0.1:19575        platform:61848         TIME_WAIT
  TCP    127.0.0.1:49376        platform:49377         ESTABLISHED
  TCP    127.0.0.1:49377        platform:49376         ESTABLISHED
  TCP    127.0.0.1:49670        platform:49671         ESTABLISHED
  TCP    127.0.0.1:49671        platform:49670         ESTABLISHED
  TCP    127.0.0.1:49672        platform:49673         ESTABLISHED
  TCP    127.0.0.1:49673        platform:49672         ESTABLISHED
  TCP    127.0.0.1:57118        platform:63736         ESTABLISHED
  TCP    127.0.0.1:58630        platform:58631         ESTABLISHED
  TCP    127.0.0.1:58631        platform:58630         ESTABLISHED
  TCP    127.0.0.1:62788        platform:62789         ESTABLISHED
  TCP    127.0.0.1:62789        platform:62788         ESTABLISHED
```

```
C:\Windows\system32>netstat -n

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:19575        127.0.0.1:49321        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:54740        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:55939        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:60557        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:60870        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:63199        TIME_WAIT
  TCP    127.0.0.1:49376        127.0.0.1:49377        ESTABLISHED
  TCP    127.0.0.1:49377        127.0.0.1:49376        ESTABLISHED
  TCP    127.0.0.1:49665        127.0.0.1:55846        ESTABLISHED
  TCP    127.0.0.1:49670        127.0.0.1:49671        ESTABLISHED
  TCP    127.0.0.1:49671        127.0.0.1:49670        ESTABLISHED
  TCP    127.0.0.1:49672        127.0.0.1:49673        ESTABLISHED
  TCP    127.0.0.1:49673        127.0.0.1:49672        ESTABLISHED
  TCP    127.0.0.1:55846        127.0.0.1:49665        ESTABLISHED
  TCP    127.0.0.1:57118        127.0.0.1:63736        ESTABLISHED
  TCP    127.0.0.1:58630        127.0.0.1:58631        ESTABLISHED
  TCP    127.0.0.1:58631        127.0.0.1:58630        ESTABLISHED
  TCP    127.0.0.1:62788        127.0.0.1:62789        ESTABLISHED
  TCP    127.0.0.1:62789        127.0.0.1:62788        ESTABLISHED
  TCP    127.0.0.1:63736        127.0.0.1:57118        ESTABLISHED
  TCP    127.0.0.1:63738        127.0.0.1:63739        ESTABLISHED
  TCP    127.0.0.1:63739        127.0.0.1:63738        ESTABLISHED
  TCP    127.0.0.1:63743        127.0.0.1:63755        ESTABLISHED
  TCP    127.0.0.1:63755        127.0.0.1:63743        ESTABLISHED
  TCP    127.0.0.1:64322        127.0.0.1:64323        ESTABLISHED
```

```
C:\Windows\system32>netstat -n 5

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    127.0.0.1:19575        127.0.0.1:50233        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:52594        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:54740        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:55939        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:58174        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:60557        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:60576        TIME_WAIT
  TCP    127.0.0.1:19575        127.0.0.1:64364        TIME_WAIT
  TCP    127.0.0.1:49376        127.0.0.1:49377        ESTABLISHED
  TCP    127.0.0.1:49377        127.0.0.1:49376        ESTABLISHED
  TCP    127.0.0.1:49665        127.0.0.1:55846        ESTABLISHED
  TCP    127.0.0.1:49670        127.0.0.1:49671        ESTABLISHED
  TCP    127.0.0.1:49671        127.0.0.1:49670        ESTABLISHED
  TCP    127.0.0.1:49672        127.0.0.1:49673        ESTABLISHED
  TCP    127.0.0.1:49673        127.0.0.1:49672        ESTABLISHED
  TCP    127.0.0.1:55846        127.0.0.1:49665        ESTABLISHED
  TCP    127.0.0.1:57118        127.0.0.1:63736        ESTABLISHED
  TCP    127.0.0.1:58630        127.0.0.1:58631        ESTABLISHED
  TCP    127.0.0.1:58631        127.0.0.1:58630        ESTABLISHED
  TCP    127.0.0.1:62788        127.0.0.1:62789        ESTABLISHED
  TCP    127.0.0.1:62789        127.0.0.1:62788        ESTABLISHED
  TCP    127.0.0.1:63736        127.0.0.1:57118        ESTABLISHED
  TCP    127.0.0.1:63738        127.0.0.1:63739        ESTABLISHED
  TCP    127.0.0.1:63739        127.0.0.1:63738        ESTABLISHED
  TCP    127.0.0.1:63743        127.0.0.1:63755        ESTABLISHED
  TCP    127.0.0.1:63755        127.0.0.1:63743        ESTABLISHED
  TCP    127.0.0.1:64322        127.0.0.1:64323        ESTABLISHED
  TCP    127.0.0.1:64323        127.0.0.1:64322        ESTABLISHED
  TCP    127.0.0.1:64324        127.0.0.1:64325        ESTABLISHED
  TCP    127.0.0.1:64325        127.0.0.1:64324        ESTABLISHED
  TCP    127.0.0.1:64326        127.0.0.1:64327        ESTABLISHED
  TCP    127.0.0.1:64327        127.0.0.1:64326        ESTABLISHED
  TCP    127.0.0.1:64335        127.0.0.1:64337        ESTABLISHED
  TCP    127.0.0.1:64336        127.0.0.1:64338        ESTABLISHED
  TCP    127.0.0.1:64337        127.0.0.1:64335        ESTABLISHED
  TCP    127.0.0.1:64338        127.0.0.1:64336        ESTABLISHED
```

```
C:\Windows\system32>netstat -a

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135            KAJ:0                  LISTENING
  TCP    0.0.0.0:445            KAJ:0                  LISTENING
  TCP    0.0.0.0:3306           KAJ:0                  LISTENING
  TCP    0.0.0.0:5040           KAJ:0                  LISTENING
  TCP    0.0.0.0:5357           KAJ:0                  LISTENING
  TCP    0.0.0.0:5700           KAJ:0                  LISTENING
  TCP    0.0.0.0:6646           KAJ:0                  LISTENING
  TCP    0.0.0.0:6881           KAJ:0                  LISTENING
  TCP    0.0.0.0:7070           KAJ:0                  LISTENING
  TCP    0.0.0.0:19575          KAJ:0                  LISTENING
  TCP    0.0.0.0:19576          KAJ:0                  LISTENING
  TCP    0.0.0.0:19577          KAJ:0                  LISTENING
  TCP    0.0.0.0:33060          KAJ:0                  LISTENING
  TCP    0.0.0.0:49664          KAJ:0                  LISTENING
  TCP    0.0.0.0:49665          KAJ:0                  LISTENING
  TCP    0.0.0.0:49666          KAJ:0                  LISTENING
  TCP    0.0.0.0:49667          KAJ:0                  LISTENING
  TCP    0.0.0.0:49668          KAJ:0                  LISTENING
  TCP    0.0.0.0:49674          KAJ:0                  LISTENING
  TCP    127.0.0.1:1001         KAJ:0                  LISTENING
  TCP    127.0.0.1:8884         KAJ:0                  LISTENING
  TCP    127.0.0.1:9012         KAJ:0                  LISTENING
  TCP    127.0.0.1:19575        platform:50968         TIME_WAIT
  TCP    127.0.0.1:19575        platform:51233         TIME_WAIT
  TCP    127.0.0.1:19575        platform:51555         TIME_WAIT
  TCP    127.0.0.1:19575        platform:54936         TIME_WAIT
  TCP    127.0.0.1:19575        platform:57818         TIME_WAIT
  TCP    127.0.0.1:19575        platform:64050         TIME_WAIT
  TCP    127.0.0.1:27017        KAJ:0                  LISTENING
  TCP    127.0.0.1:49376        platform:49377         ESTABLISHED
  TCP    127.0.0.1:49377        platform:49376         ESTABLISHED
  TCP    127.0.0.1:49665        platform:64119         ESTABLISHED
  TCP    127.0.0.1:49670        platform:49671         ESTABLISHED
  TCP    127.0.0.1:49671        platform:49670         ESTABLISHED
  TCP    127.0.0.1:49672        platform:49673         ESTABLISHED
  TCP    127.0.0.1:49673        platform:49672         ESTABLISHED
  TCP    127.0.0.1:49710        KAJ:0                  LISTENING
  TCP    127.0.0.1:53659        KAJ:0                  LISTENING
  TCP    127.0.0.1:57118        platform:63736         ESTABLISHED
  TCP    127.0.0.1:58630        platform:58631         ESTABLISHED
  TCP    127.0.0.1:58631        platform:58630         ESTABLISHED
  TCP    127.0.0.1:62788        platform:62789         ESTABLISHED
```

Linux

- Ping

```
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $ping google.com
PING google.com (172.217.167.142) 56(84) bytes of data.
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=1 ttl=119 time=21.7 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=2 ttl=119 time=41.3 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=3 ttl=119 time=18.2 ms
^C
--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 18.207/27.060/41.276/10.152 ms
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $ping -a google.com
PING google.com (172.217.167.142) 56(84) bytes of data.
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=3 ttl=119 time=20.1 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=4 ttl=119 time=18.6 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=5 ttl=119 time=20.6 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=6 ttl=119 time=17.7 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=7 ttl=119 time=18.6 ms
^C
--- google.com ping statistics ---
7 packets transmitted, 5 received, 28.5714% packet loss, time 6055ms
rtt min/avg/max/mdev = 17.723/19.119/20.556/1.054 ms
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $ping -v
ping: usage error: Destination address required
┌─[✗]─[roshan@roshan-virtualbox]─[~]
└──╼ $ping -b google.com
PING google.com (172.217.167.142) 56(84) bytes of data.
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=1 ttl=119 time=22.4 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=2 ttl=119 time=19.6 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=3 ttl=119 time=20.5 ms
64 bytes from maa03s26-in-f14.1e100.net (172.217.167.142): icmp_seq=4 ttl=119 time=18.7 ms
^C
--- google.com ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3008ms
rtt min/avg/max/mdev = 18.708/20.299/22.433/1.384 ms
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $
```

- Route

```
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.0.2.2        0.0.0.0         UG    100    0        0 eth0
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 eth0
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $route -n
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0         10.0.2.2        0.0.0.0         UG    100    0        0 eth0
10.0.2.0        0.0.0.0         255.255.255.0   U     100    0        0 eth0
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $route -Cn
Kernel IP routing cache
Source          Destination     Gateway         Flags Metric Ref    Use Iface
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $ip route
default via 10.0.2.2 dev eth0 proto dhcp metric 100
10.0.2.0/24 dev eth0 proto kernel scope link src 10.0.2.15 metric 100
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $
```

- Traceroute

```
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $traceroute google.com
traceroute to google.com (142.250.196.78), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.490 ms  0.945 ms  1.061 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * * *
13  * * *
14  * * *
15  * * *
16  * * *
17  * * *^C
┌─[✗]─[roshan@roshan-virtualbox]─[~]
└──╼ $traceroute -4 google.com
traceroute to google.com (142.250.196.78), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.721 ms  0.862 ms  1.344 ms
 2  * * *
 3  * * *
 4  * * *
 5  * * *
 6  * * *
 7  * * *
 8  * * *
 9  * * *
10  * * *
11  * * *
12  * *^C
┌─[✗]─[roshan@roshan-virtualbox]─[~]
└──╼ $traceroute -6 google.com
traceroute to google.com (2404:6800:4007:822::200e), 30 hops max, 80 byte packets
connect: Network is unreachable
┌─[✗]─[roshan@roshan-virtualbox]─[~]
└──╼ $
```

- NSlookup

```
┌─[roshan@roshan-virtualbox]─[~]
└─$nslookup google.com
Server:         192.168.1.1
Address:        192.168.1.1#53

Non-authoritative answer:
Name:   google.com
Address: 172.217.167.142
Name:   google.com
Address: 2404:6800:4007:82b::200e

┌─[roshan@roshan-virtualbox]─[~]
└─$nslookup -q-MX google.com
*** Invalid option: q-MX
Server:         192.168.1.1
Address:        192.168.1.1#53

Non-authoritative answer:
Name:   google.com
Address: 172.217.167.142
Name:   google.com
Address: 2404:6800:4007:82b::200e

┌─[roshan@roshan-virtualbox]─[~]
└─$nslookup -type=soa google.com
Server:         192.168.1.1
Address:        192.168.1.1#53

Non-authoritative answer:
google.com
        origin = ns1.google.com
        mail addr = dns-admin.google.com
        serial = 396314134
        refresh = 900
        retry = 900
        expire = 1800
        minimum = 60

Authoritative answers can be found from:
google.com      nameserver = ns4.google.com.
google.com      nameserver = ns2.google.com.
google.com      nameserver = ns3.google.com.
google.com      nameserver = ns1.google.com.
ns3.google.com  internet address = 216.239.36.10
ns3.google.com  has AAAA address 2001:4860:4802:36::a
ns4.google.com  internet address = 216.239.38.10
ns4.google.com  has AAAA address 2001:4860:4802:38::a
ns1.google.com  internet address = 216.239.32.10
ns1.google.com  has AAAA address 2001:4860:4802:32::a
ns2.google.com  internet address = 216.239.34.10
ns2.google.com  has AAAA address 2001:4860:4802:34::a

┌─[roshan@roshan-virtualbox]─[~]
```

- Ifconfig

```
┌─[roshan@roshan-virtualbox]─[~]
└─$ 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::3132:5d79:f849:15f5  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:a6:26:cc  txqueuelen 1000  (Ethernet)
        RX packets 169  bytes 20357 (19.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 302  bytes 28808 (28.1 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 20  bytes 1096 (1.0 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 20  bytes 1096 (1.0 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

┌─[roshan@roshan-virtualbox]─[~]
└─$ 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::3132:5d79:f849:15f5  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:a6:26:cc  txqueuelen 1000  (Ethernet)
        RX packets 169  bytes 20357 (19.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 302  bytes 28808 (28.1 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 20  bytes 1096 (1.0 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 20  bytes 1096 (1.0 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

┌─[roshan@roshan-virtualbox]─[~]
└─$ ifconfig -s
Iface      MTU    RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
eth0      1500      169      0      0 0           303      0      0      0 BMRU
lo       65536       20      0      0 0            20      0      0      0 LRU
┌─[roshan@roshan-virtualbox]─[~]
└─$ 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::3132:5d79:f849:15f5  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:a6:26:cc  txqueuelen 1000  (Ethernet)
        RX packets 169  bytes 20357 (19.8 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
```

- Netstat

```
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $netstat
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  3      [ ]         DGRAM                    14636    /run/systemd/notify
unix  2      [ ]         DGRAM                    14653    /run/systemd/journal/syslog
unix  13     [ ]         DGRAM                    14659    /run/systemd/journal/dev-log
unix  6      [ ]         DGRAM                    14661    /run/systemd/journal/socket
unix  2      [ ]         DGRAM                    16361    /run/user/1000/systemd/notify
unix  3      [ ]         STREAM     CONNECTED     21018
unix  3      [ ]         STREAM     CONNECTED     21056    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     23061    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     21123
unix  3      [ ]         STREAM     CONNECTED     21012    /run/systemd/journal/stdout
unix  2      [ ]         DGRAM                    18626
unix  3      [ ]         STREAM     CONNECTED     22955    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     15058    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     24712
unix  3      [ ]         STREAM     CONNECTED     24980
unix  3      [ ]         STREAM     CONNECTED     21120
unix  3      [ ]         STREAM     CONNECTED     22906    /run/user/1000/bus
unix  2      [ ]         DGRAM                    16343
unix  3      [ ]         STREAM     CONNECTED     22943    @/tmp/.X11-unix/X0
unix  2      [ ]         DGRAM                    19013
unix  3      [ ]         STREAM     CONNECTED     21172
unix  3      [ ]         STREAM     CONNECTED     25677    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     21157    @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     22835
unix  3      [ ]         STREAM     CONNECTED     18907    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     16067    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     16316    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     22838    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     18997
unix  3      [ ]         STREAM     CONNECTED     20383    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     22982    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     24929
unix  3      [ ]         STREAM     CONNECTED     20264
unix  3      [ ]         STREAM     CONNECTED     24860
unix  3      [ ]         STREAM     CONNECTED     22854
unix  3      [ ]         STREAM     CONNECTED     24601    /run/user/1000/pipewire-0
```

```
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $netstat -n
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 10.0.2.15:68            10.0.2.2:67             ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  3      [ ]         DGRAM                    14636    /run/systemd/notify
unix  2      [ ]         DGRAM                    14653    /run/systemd/journal/syslog
unix  13     [ ]         DGRAM                    14659    /run/systemd/journal/dev-log
unix  6      [ ]         DGRAM                    14661    /run/systemd/journal/socket
unix  2      [ ]         DGRAM                    16361    /run/user/1000/systemd/notify
unix  3      [ ]         STREAM     CONNECTED     21018
unix  3      [ ]         STREAM     CONNECTED     21056    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     23061    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     21123
unix  3      [ ]         STREAM     CONNECTED     21012    /run/systemd/journal/stdout
unix  2      [ ]         DGRAM                    18626
unix  3      [ ]         STREAM     CONNECTED     22955    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     15058    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     24712
unix  3      [ ]         STREAM     CONNECTED     24980
unix  3      [ ]         STREAM     CONNECTED     21120
unix  3      [ ]         STREAM     CONNECTED     22906    /run/user/1000/bus
unix  2      [ ]         DGRAM                    16343
unix  3      [ ]         STREAM     CONNECTED     22943    @/tmp/.X11-unix/X0
```

```
┌─[roshan@roshan-virtualbox]─[~]
└──╼ $netstat -n
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 10.0.2.15:68            10.0.2.2:67             ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  3      [ ]         DGRAM                    14636    /run/systemd/notify
unix  2      [ ]         DGRAM                    14653    /run/systemd/journal/syslog
unix  13     [ ]         DGRAM                    14659    /run/systemd/journal/dev-log
unix  6      [ ]         DGRAM                    14661    /run/systemd/journal/socket
unix  2      [ ]         DGRAM                    16361    /run/user/1000/systemd/notify
unix  3      [ ]         STREAM     CONNECTED     21018
unix  3      [ ]         STREAM     CONNECTED     21056    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     23061    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     21123
unix  3      [ ]         STREAM     CONNECTED     21012    /run/systemd/journal/stdout
unix  2      [ ]         DGRAM                    18626
unix  3      [ ]         STREAM     CONNECTED     22955    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     15058    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     24712
unix  3      [ ]         STREAM     CONNECTED     24980
unix  3      [ ]         STREAM     CONNECTED     21120
unix  3      [ ]         STREAM     CONNECTED     22906    /run/user/1000/bus
unix  2      [ ]         DGRAM                    16343
unix  3      [ ]         STREAM     CONNECTED     22943    @/tmp/.X11-unix/X0
unix  2      [ ]         DGRAM                    19013
unix  3      [ ]         STREAM     CONNECTED     21172
unix  3      [ ]         STREAM     CONNECTED     25677    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     21157    @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     22835
unix  3      [ ]         STREAM     CONNECTED     18907    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     16067    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     16316    /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     22838    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     18997
```

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
     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
             ├─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 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:mariadbd(8)
             https://mariadb.com/kb/en/library/systemd/
```

```
└─$ 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
```

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

Install ansible sudo apt install ansible ansible --version

```
root@LAPTOP-4DJBAO1Q:~# sudo apt install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  cowsay sshpass
The following NEW packages will be installed:
  ansible
0 upgraded, 1 newly installed, 0 to remove and 55 not upgraded.
Need to get 5794 kB of archives.
After this operation, 58.0 MB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/universe amd64 ansible all 2.9.6+dfsg-1 [5794 kB]
Fetched 5794 kB in 14s (404 kB/s)
Selecting previously unselected package ansible.
(Reading database ... 36333 files and directories currently installed.)
Preparing to unpack .../ansible_2.9.6+dfsg-1_all.deb ...
Unpacking ansible (2.9.6+dfsg-1) ...
Setting up ansible (2.9.6+dfsg-1) ...
Processing triggers for man-db (2.9.1-1) ...
```

```
root@LAPTOP-4DJBAO1Q:~# ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Jun  2 2021, 10:49:15) [GCC 9.4.0]
root@LAPTOP-4DJBAO1Q:~#
```

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

```
root@LAPTOP-4DJBAO1Q:~# 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]
Get:5 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1256 kB]
Fetched 1584 kB in 7s (217 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

```
root@LAPTOP-4DJBAO1Q:~# sudo tcpdump
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on eth0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:50:22.482573 IP LAPTOP-4DJBAO1Q.mshome.net.51134 > 239.255.255.250.1900: UDP, length 173
14:50:22.497244 IP 172.19.139.16.59879 > LAPTOP-4DJBAO1Q.mshome.net.domain: 43809+ PTR? 250.255.255.239.in-addr.arpa. (46)
14:50:22.500451 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:22.501129 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:22.741922 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:22.742703 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:23.489645 IP LAPTOP-4DJBAO1Q.mshome.net.51134 > 239.255.255.250.1900: UDP, length 173
14:50:23.489883 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:23.490280 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:23.747716 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:23.748662 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:50:23.969470 IP LAPTOP-4DJBAO1Q.mshome.net.domain > 172.19.139.16.59879: 43809 NXDomain 0/1/0 (103)
14:50:23.969784 IP 172.19.139.16.46953 > LAPTOP-4DJBAO1Q.mshome.net.domain: 17822+ PTR? 1.128.19.172.in-addr.arpa. (43)
14:50:23.970715 IP LAPTOP-4DJBAO1Q.mshome.net.domain > 172.19.139.16.46953: 17822- 1/0/0 PTR LAPTOP-4DJBAO1Q.mshome.net. (100)
14:50:23.971016 IP 172.19.139.16.44462 > LAPTOP-4DJBAO1Q.mshome.net.domain: 16045+ PTR? 16.139.19.172.in-addr.arpa. (44)
14:50:23.971871 IP LAPTOP-4DJBAO1Q.mshome.net.domain > 172.19.139.16.59879: 43809 NXDomain 0/1/0 (103)
14:50:23.971892 IP 172.19.139.16 > LAPTOP-4DJBAO1Q.mshome.net: ICMP 172.19.139.16 udp port 59879 unreachable, length 139
14:50:23.972665 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:23.973161 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:24.497182 IP LAPTOP-4DJBAO1Q.mshome.net.51134 > 239.255.255.250.1900: UDP, length 173
14:50:24.708788 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:24.709731 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:24.966995 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:24.967398 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:25.498845 IP LAPTOP-4DJBAO1Q.mshome.net.51134 > 239.255.255.250.1900: UDP, length 173
14:50:25.795879 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:25.795710 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 16.139.19.172.in-addr.arpa.local. (50)
14:50:26.224018 IP LAPTOP-4DJBAO1Q.mshome.net.domain > 172.19.139.16.44462: 16045 NXDomain 0/1/0 (121)
```

tcpdump –D

```
root@LAPTOP-4DJBAO1Q:~# 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.tunl0 [none]
9.sit0 [none]
10.bond0 [none]
root@LAPTOP-4DJBAO1Q:~#
```

```
root@LAPTOP-4DJBAO1Q:~# tcpdump -i enp2s0
tcpdump: enp2s0: No such device exists
(SIOCGIFHWADDR: No such device)
```

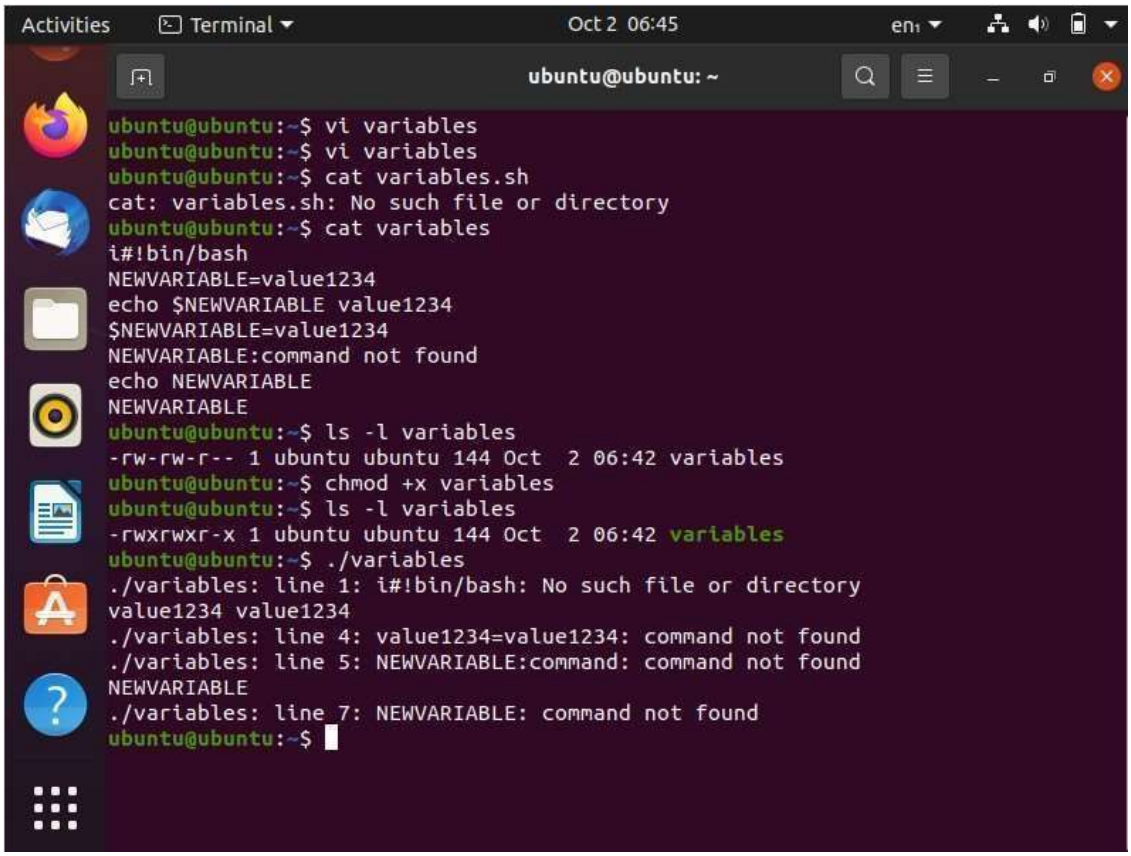
tcpdump -c 5

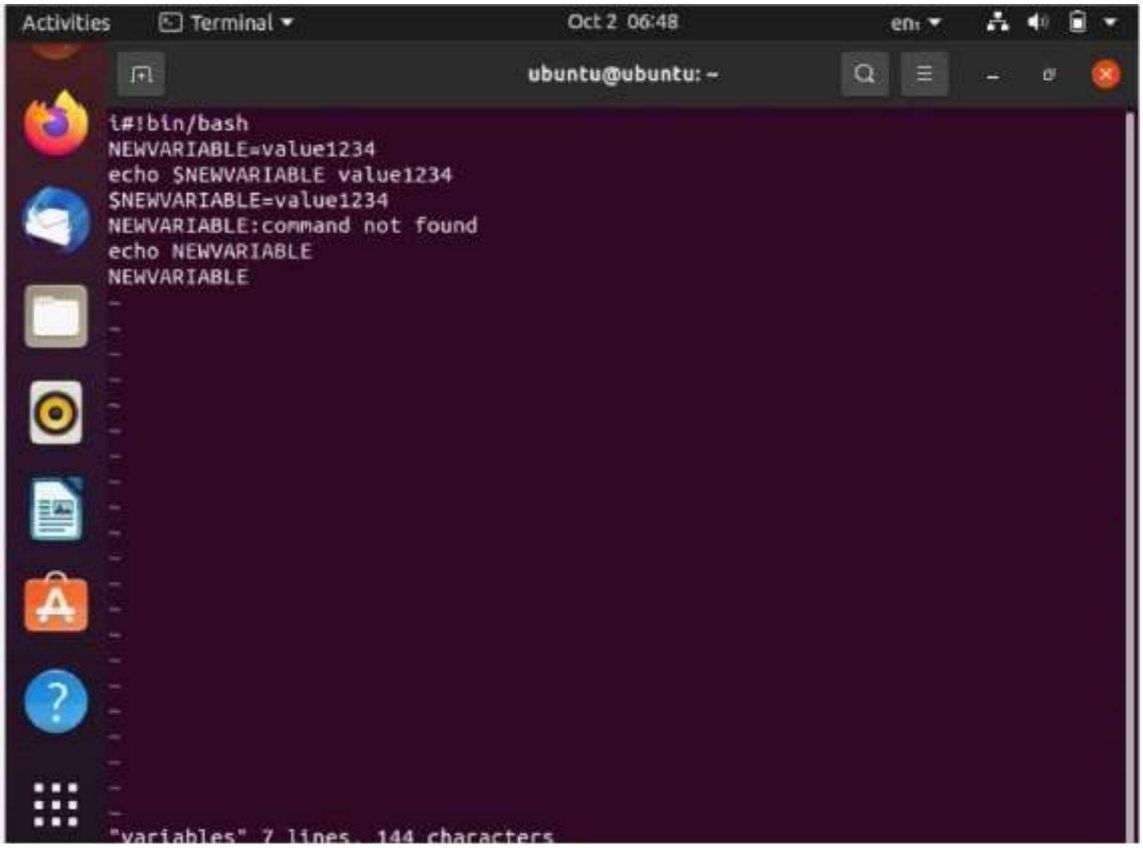
```
root@LAPTOP-4DJBAO1Q:~# tcpdump -c 5
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on eth0, link-type EN10MB (Ethernet), capture size 262144 bytes
14:55:20.499848 IP LAPTOP-4DJBAO1Q.mshome.net.64256 > 239.255.255.250.1900: UDP, length 173
14:55:20.500513 IP 172.19.139.16.60079 > LAPTOP-4DJBAO1Q.mshome.net.domain: 4675+ PTR? 250.255.255.239.in-addr.arpa. (46)
14:55:20.503343 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:55:20.504224 IP6 LAPTOP-4DJBAO1Q.mdns > ff02::fb.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
14:55:20.727772 IP LAPTOP-4DJBAO1Q.mshome.net.mdns > 224.0.0.251.mdns: 0 PTR (QM)? 250.255.255.239.in-addr.arpa.local. (52)
5 packets captured
74 packets received by filter
39 packets dropped by kernel
```

1. vi

```
ser@user-VirtualBox:~/Desktop$ cat vi roshan.sh
at: vi: No such file or directory

cho enter your name
ead roshan
cho enter your college
ead amal jyothi college
cho name:$name
cho college:$amal jyothi college

ser@user-VirtualBox:~/Desktop$ ls -l roshan.sh
rwxrwxr-x 1 user user 135 Oct  2 22:48 roshan.sh
ser@user-VirtualBox:~/Desktop$ chmod +x roshan.sh
ser@user-VirtualBox:~/Desktop$ ls -l roshan.sh
rwxrwxr-x 1 user user 135 Oct  2 22:48 roshan.sh
ser@user-VirtualBox:~/Desktop$ ./roshan.sh
nter your name
oshan
Ubuntu Software
nter your college
mal jyothi college
ame:
ollege:amal jyothi college
ser@user-VirtualBox:~/Desktop$
```

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



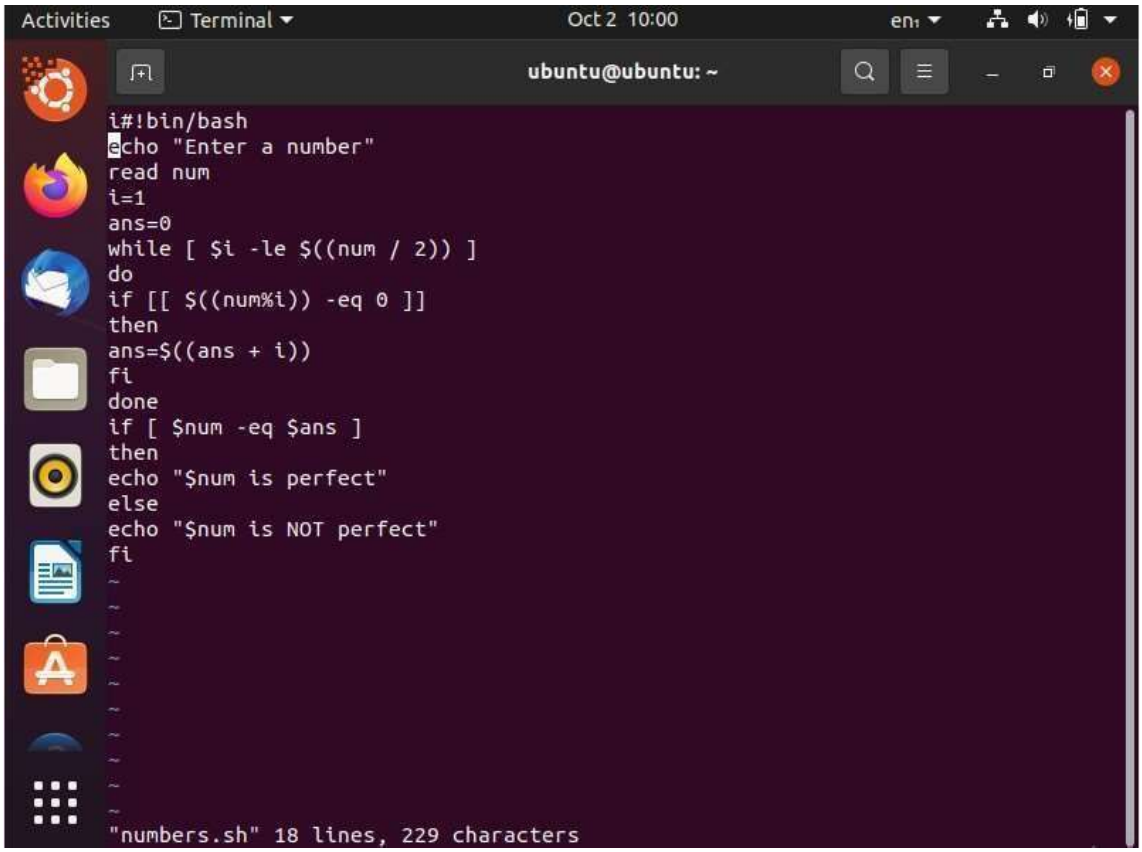


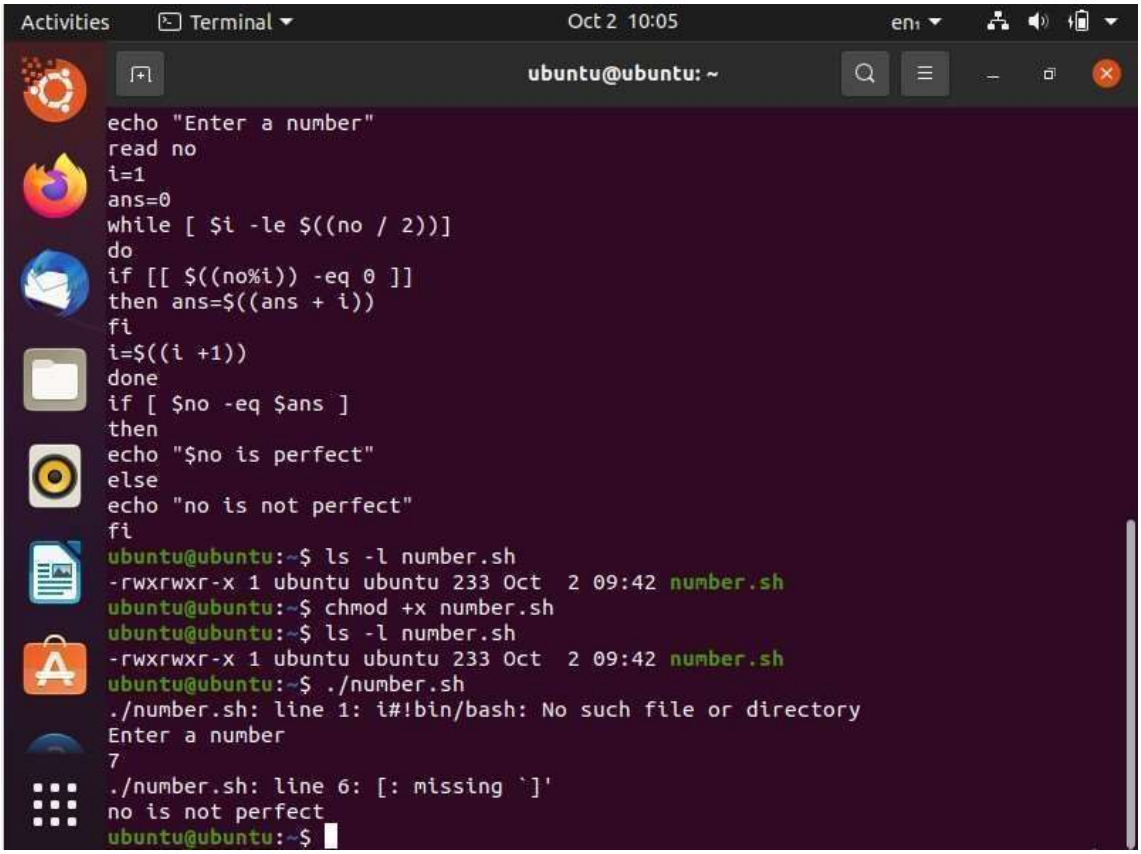
3. **Write a shell script to perform addition, substration, multiplication, division with two numbers that is accepted from user.**

```
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
```

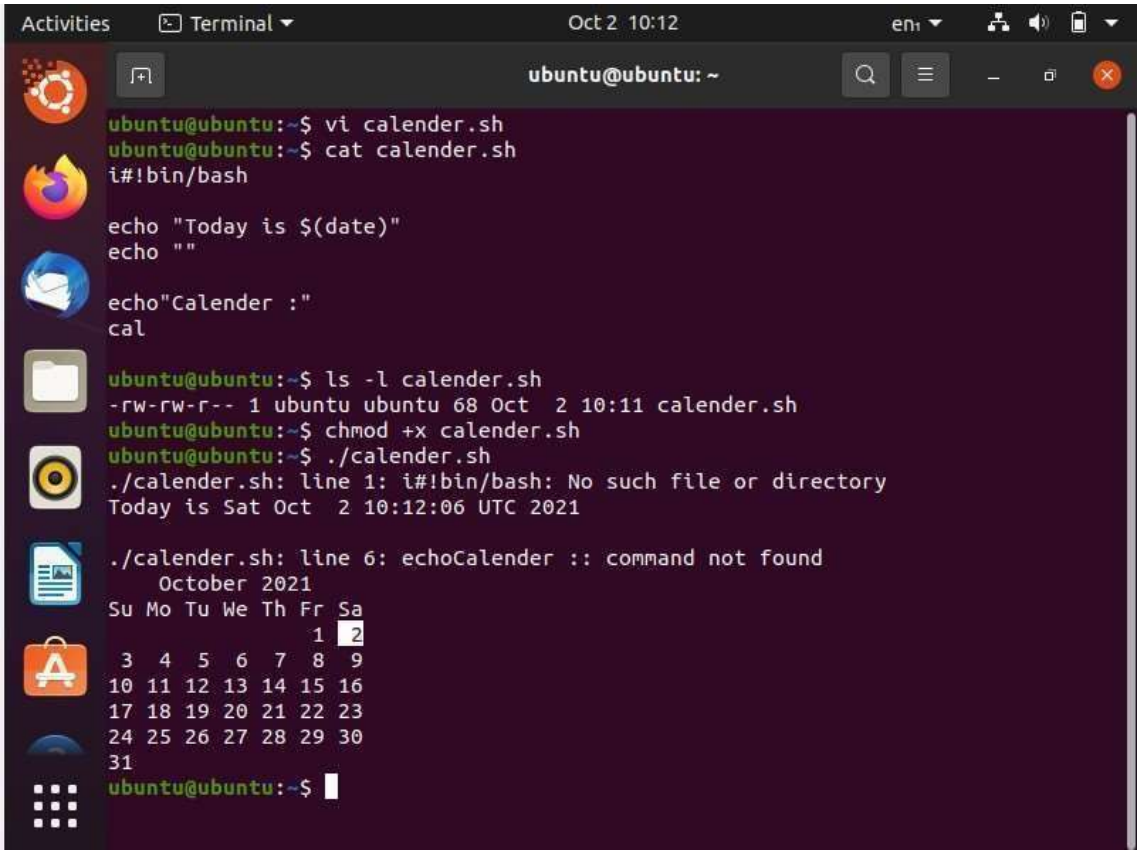
```
ubuntu@ubuntu:~$ cat operations.sh
i#!bin/bash
 a=100
b=20

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:~$
```

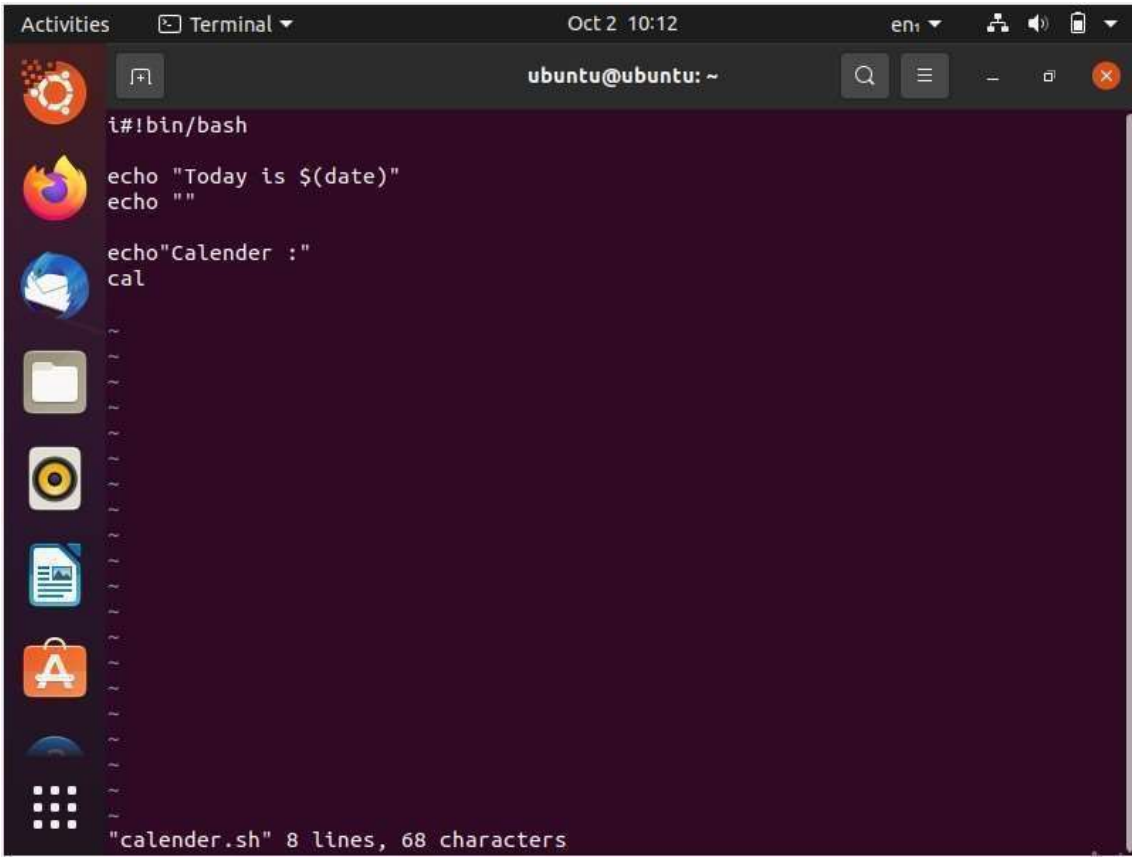
4. **Write a shell script to check the value of a given number and display whether the number is found or not.**



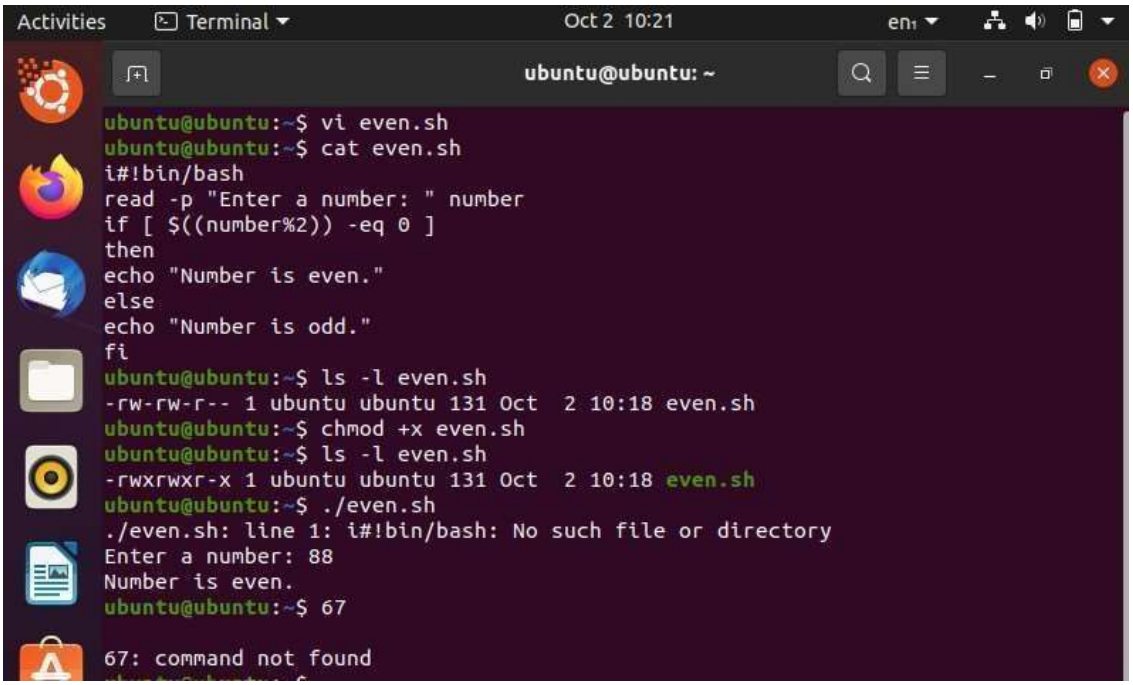

Activities
Terminal
Oct 2 10:05
en
ubuntu@ubuntu: ~
echo "Enter a number"
read no
i=1
ans=0
while [$i -le $((no / 2))]
do
if [[$((no%i)) -eq 0]]
then ans=$((ans + i))
fi
i=$((i +1))
done
if [$no -eq $ans]
then
echo "$no is perfect"
else
echo "no is not perfect"
fi
ubuntu@ubuntu:~$ ls -l number.sh
-rwxrwxr-x 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:~$

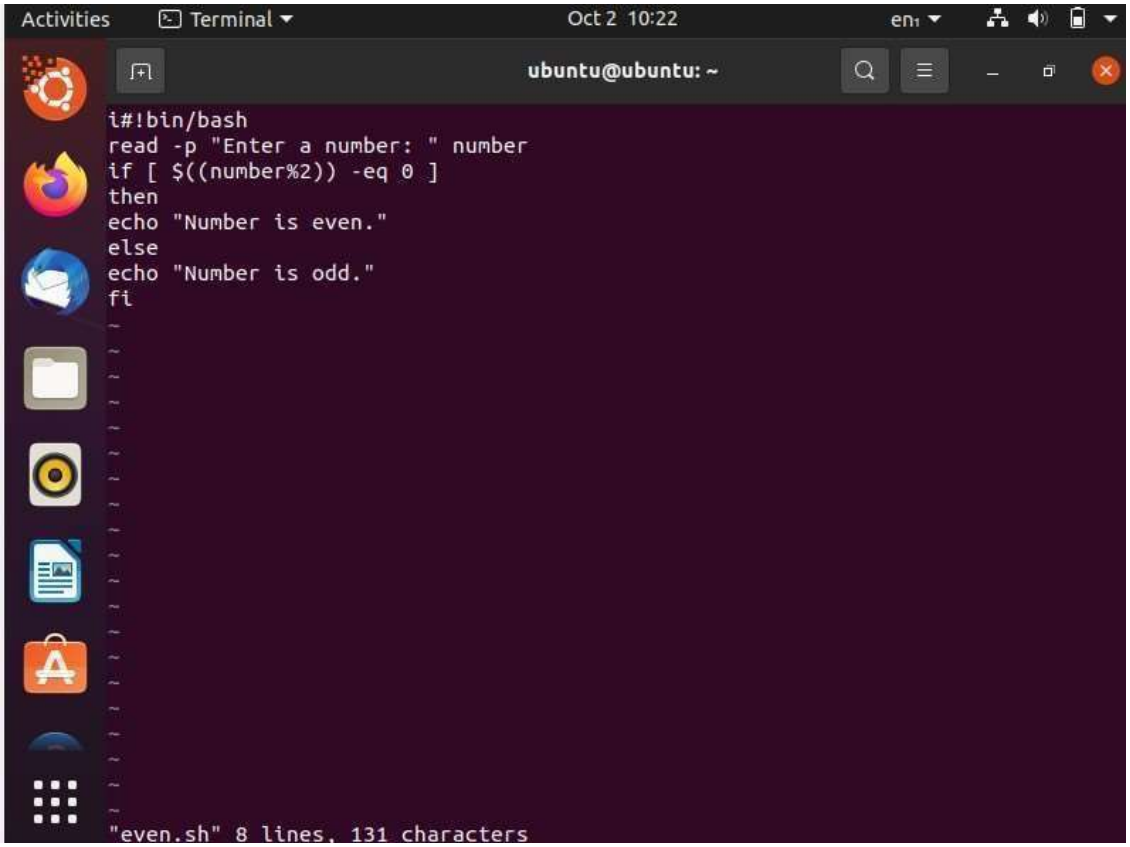
5. Write a shell script to display current date, calendar.



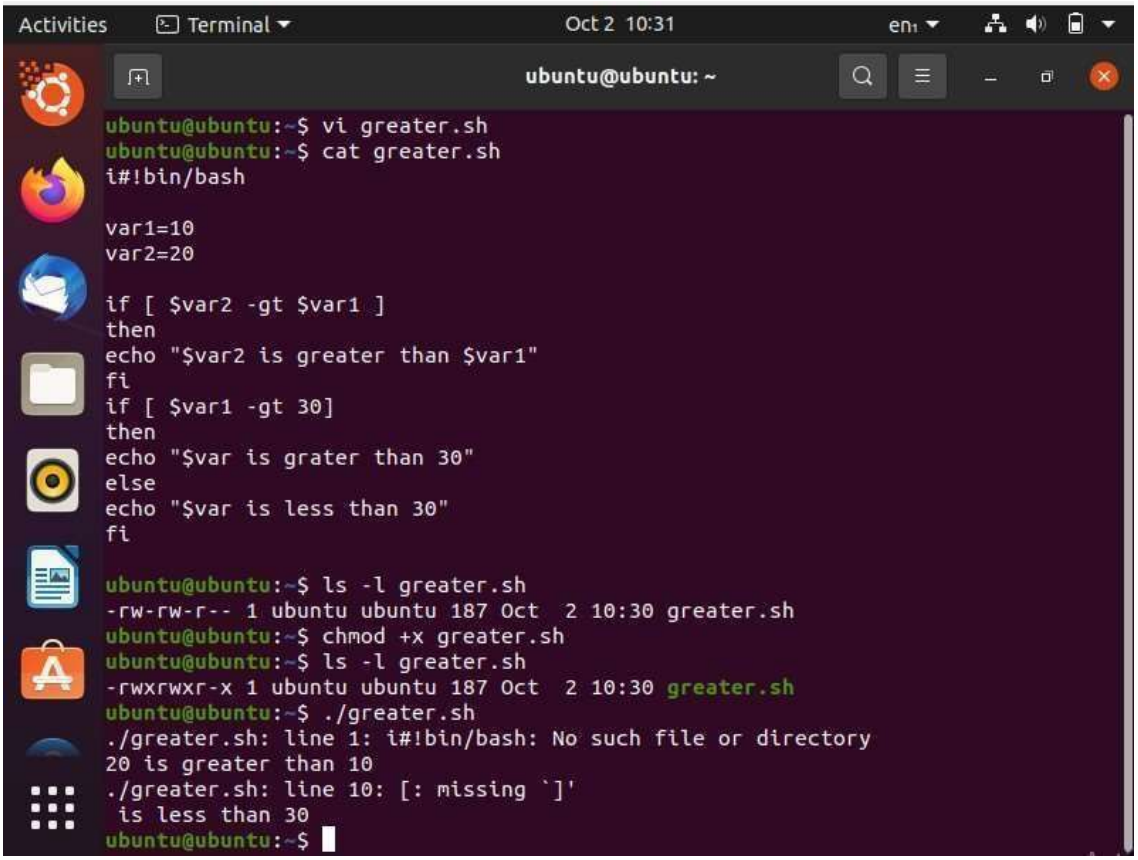


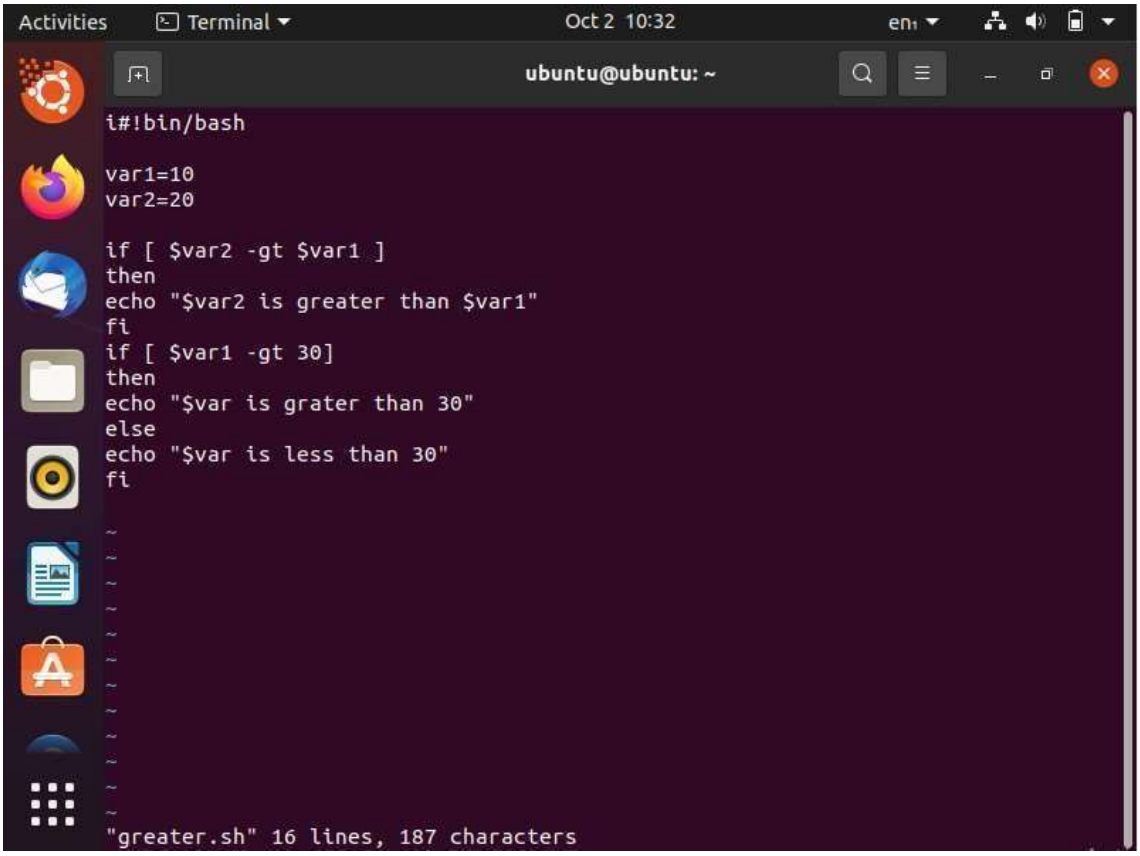
6. Write a shell script to check a number is even or odd.




Activities
Terminal
Oct 2 10:22
en
ubuntu@ubuntu: ~
i#!bin/bash
read -p "Enter a number: " number
if [$((number%2)) -eq 0]
then
echo "Number is even."
else
echo "Number is odd."
fi
"even.sh" 8 lines, 131 characters

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

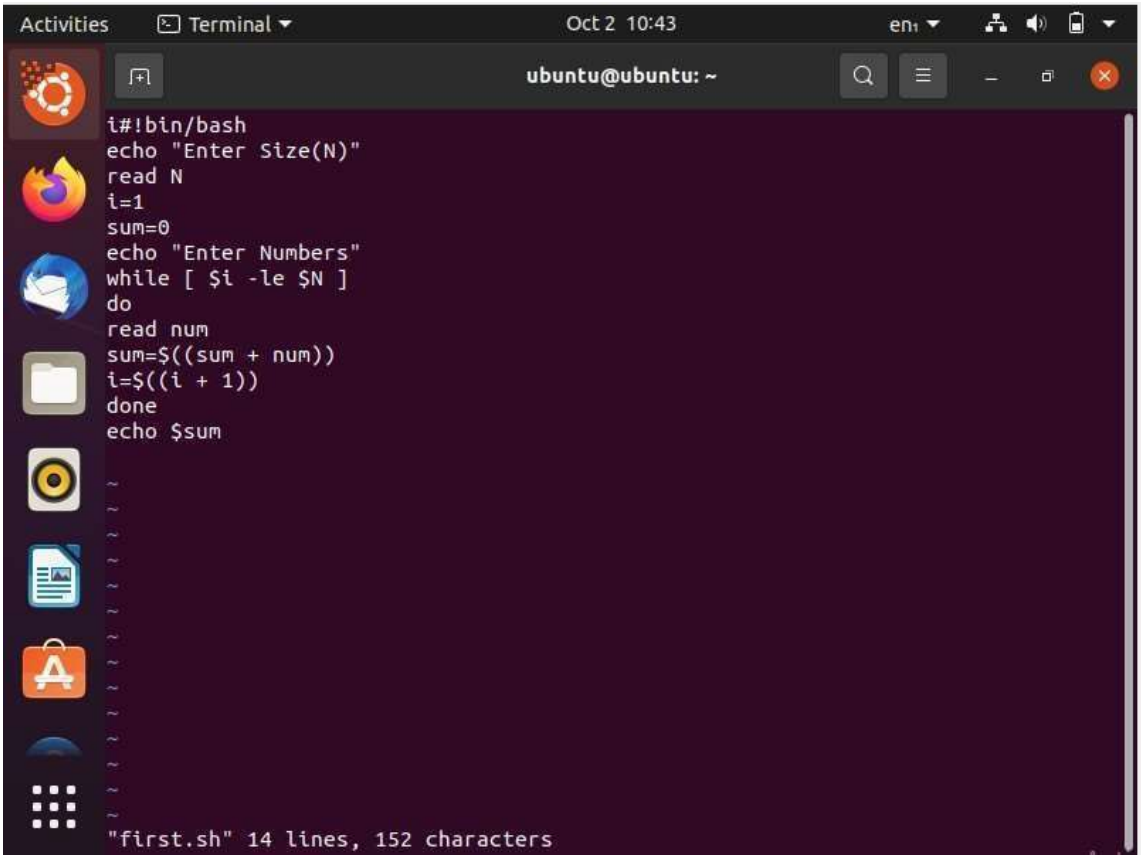




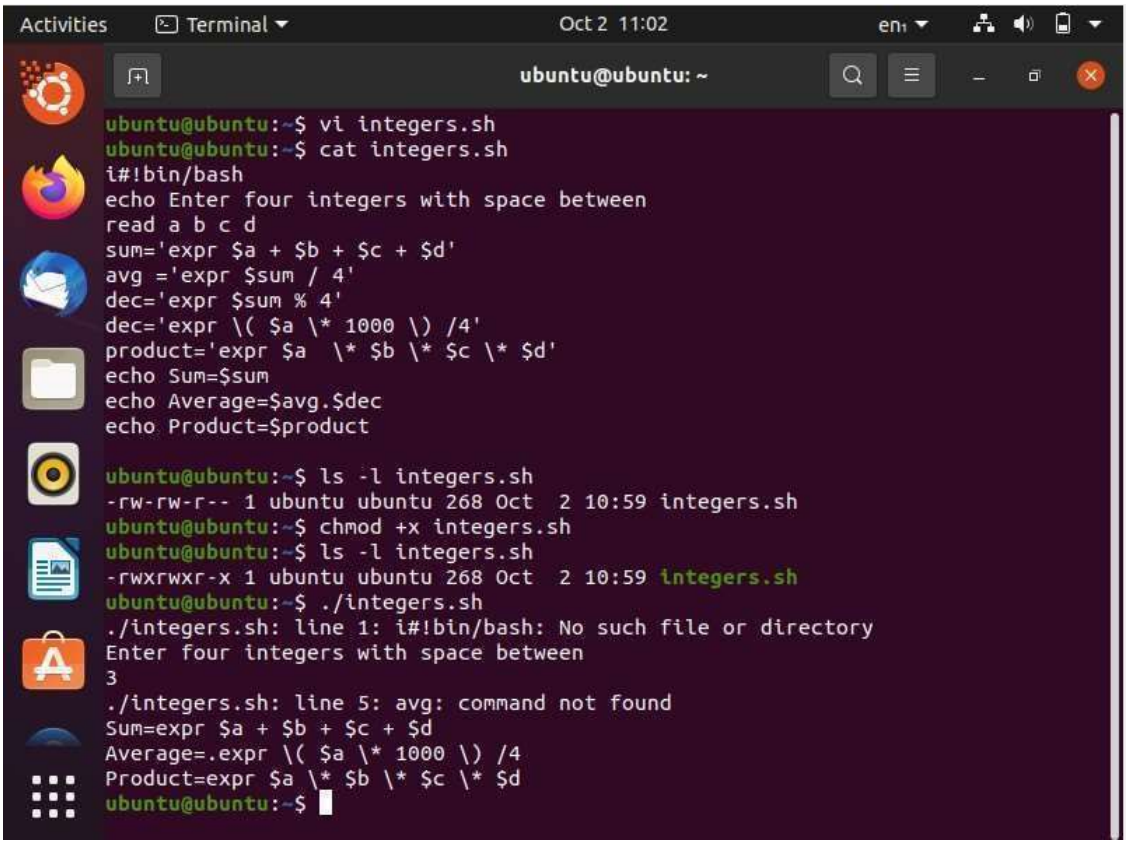
8. Write a shell script to find sum of first 10 numbers.

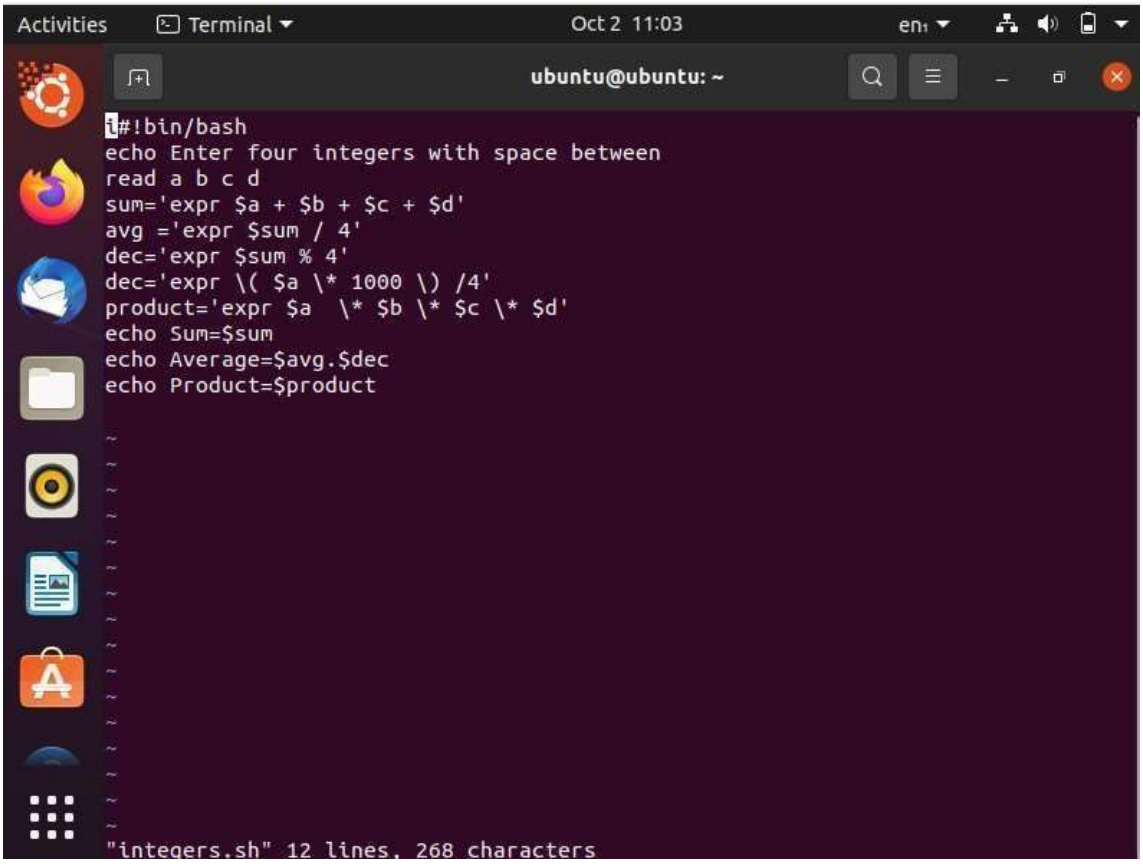
```
ubuntu@ubuntu:~$ vi first.sh
ubuntu@ubuntu:~$ cat first.sh
i#!bin/bash
echo "Enter Size(N)"
read N
i=1
sum=0
echo "Enter Numbers"
while [ $i -le $N ]
do
read num
sum=$((sum + num))
i=$((i + 1))
done
echo $sum

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
```

```
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
ubuntu@ubuntu:~$
```



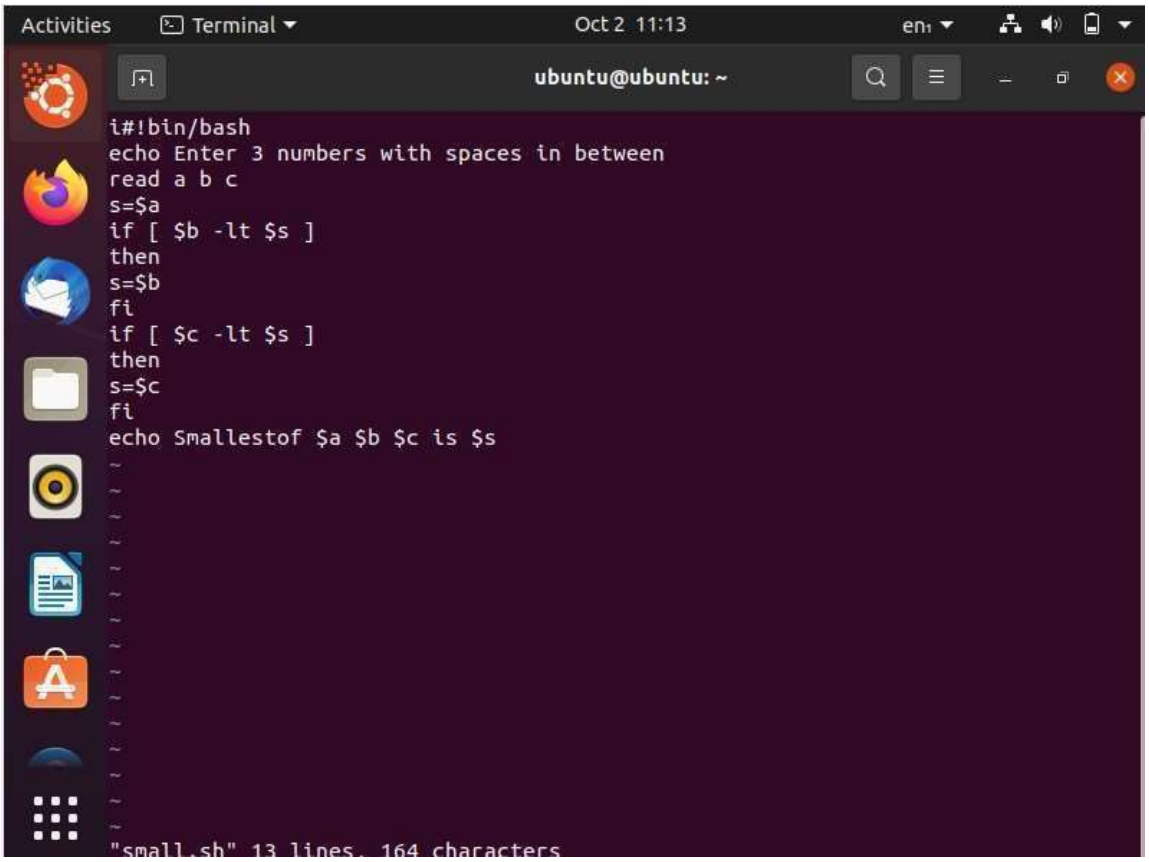
9. **Write a shell script to find the sum, average and the product of the four integers entered.**


Activities
Terminal
Oct 2 11:02
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ vi integers.sh
ubuntu@ubuntu:~$ cat integers.sh
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=$product
ubuntu@ubuntu:~$ 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 * $d
ubuntu@ubuntu:~$



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

```
ubuntu@ubuntu:~$ vi small.sh
ubuntu@ubuntu:~$ cat small.sh
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 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
```



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

```
ubuntu@ubuntu:~$ vi fact.sh
ubuntu@ubuntu:~$ cat fact.sh
i#!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:~$
```

```
i#!bin/bash
echo "Enter a number"
read num
fact=1
while [ $num -gt 1 ]
do
fact=$((fact * num))
num=$((num -1))
done
echo $fact
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"fact.sh" 11 lines, 128 characters
```

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

```
ubuntu@ubuntu:~$ vi pal.sh
ubuntu@ubuntu:~$ cat pal.sh
i#!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:~$
```

```
i#!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
```

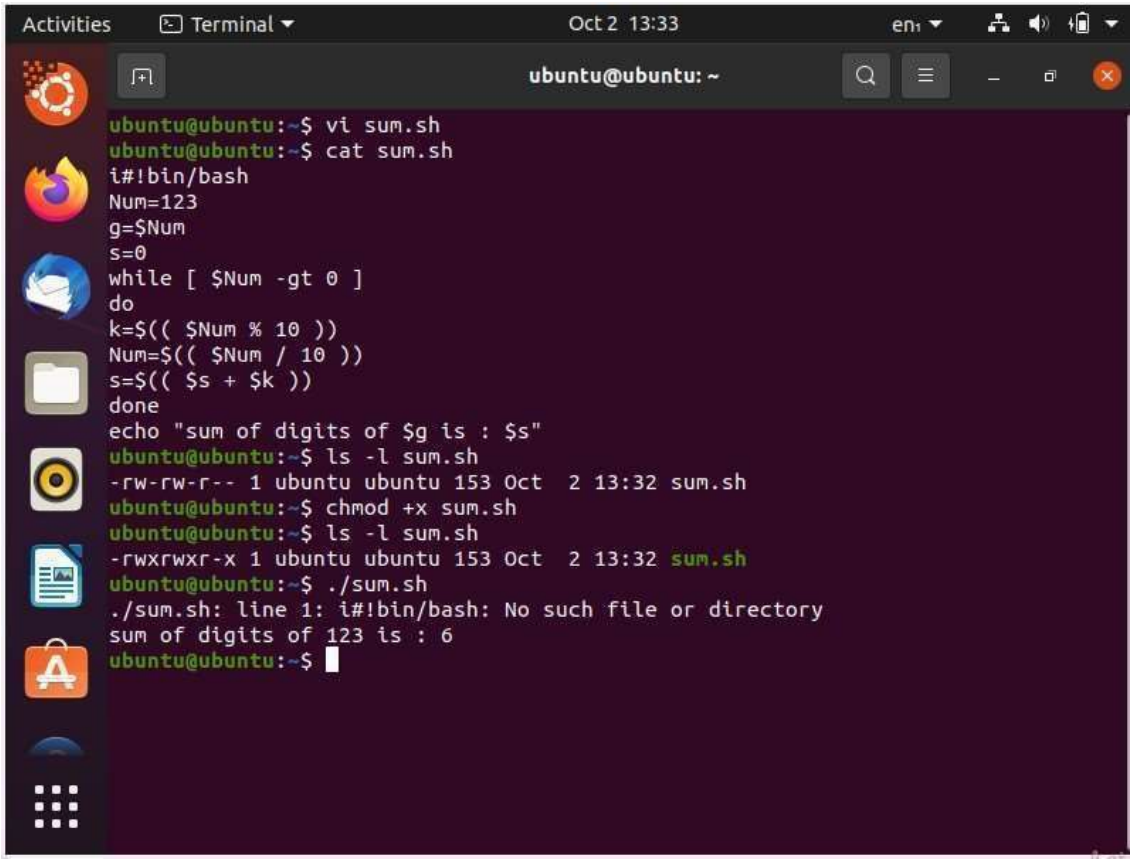
13. **Write a shell script to find the average of the numbers entered in command line.**

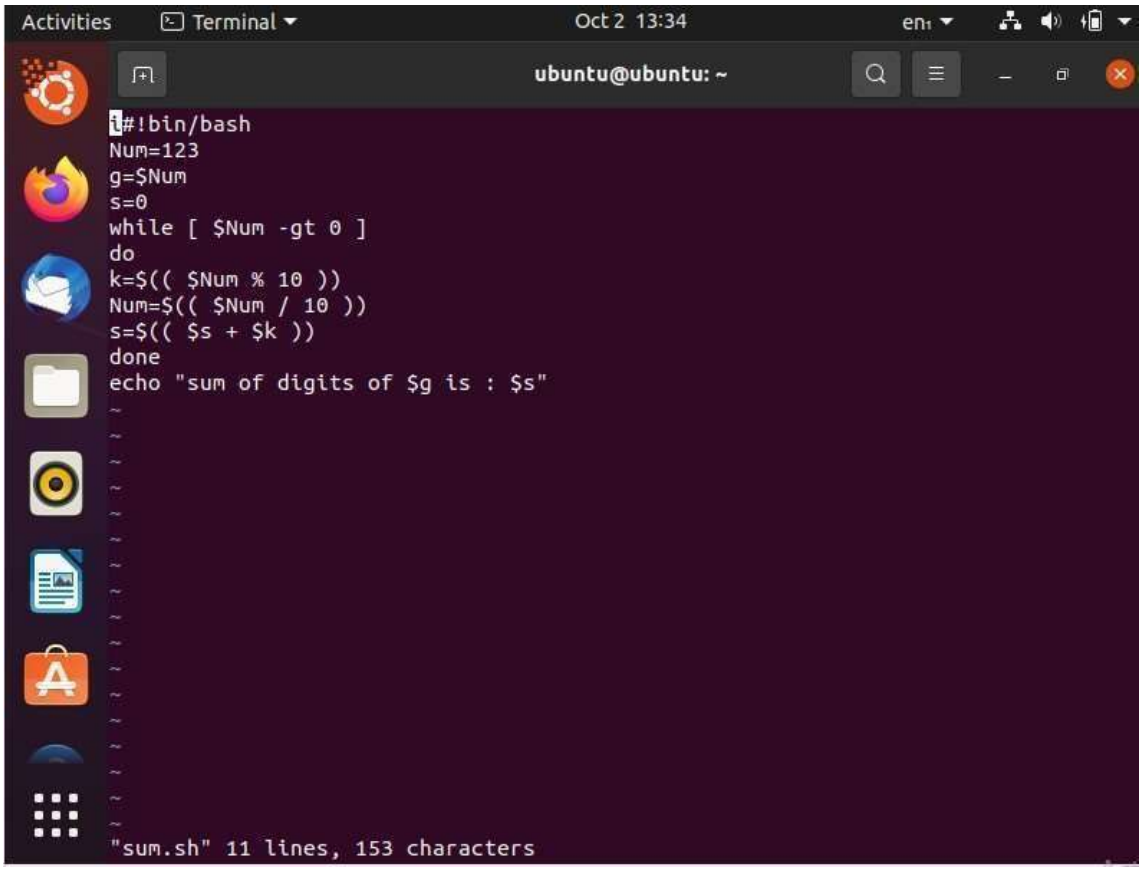
```
ubuntu@ubuntu:~$ vi avg.sh
ubuntu@ubuntu:~$ cat avg.sh
i#!bin/bash
echo "Enter Size(N)"
read N
i=1
sum=0
echo "Enter  Numbers"
while [ $i -le $N ]
do
read num
sum=$((sum + num))
i=$((i + 1))
done
avg=$(echo $sum / $N | bc -l)
echo $avg
ubuntu@ubuntu:~$ ls -l avg.sh
-rw-rw-r-- 1 ubuntu ubuntu 181 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
3.66666666666666666666
ubuntu@ubuntu:~$
```

```
Activities   Terminal   Oct 2 13:26   en1
Install Ubuntu 20.04.2.0 LTS   ubuntu@ubuntu: ~
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=$((i + 1))
done
avg=$(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
en
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ vi sum.sh
ubuntu@ubuntu:~$ cat sum.sh
i#!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:~$



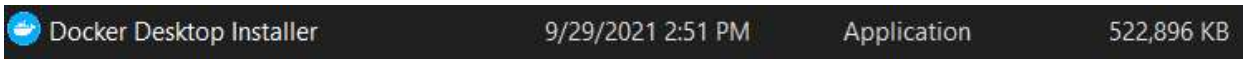
15. Write a shell program to check whether given year is leap year or not.

```
ubuntu@ubuntu:~$ vi year.sh
ubuntu@ubuntu:~$ cat year.sh
i#!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
```

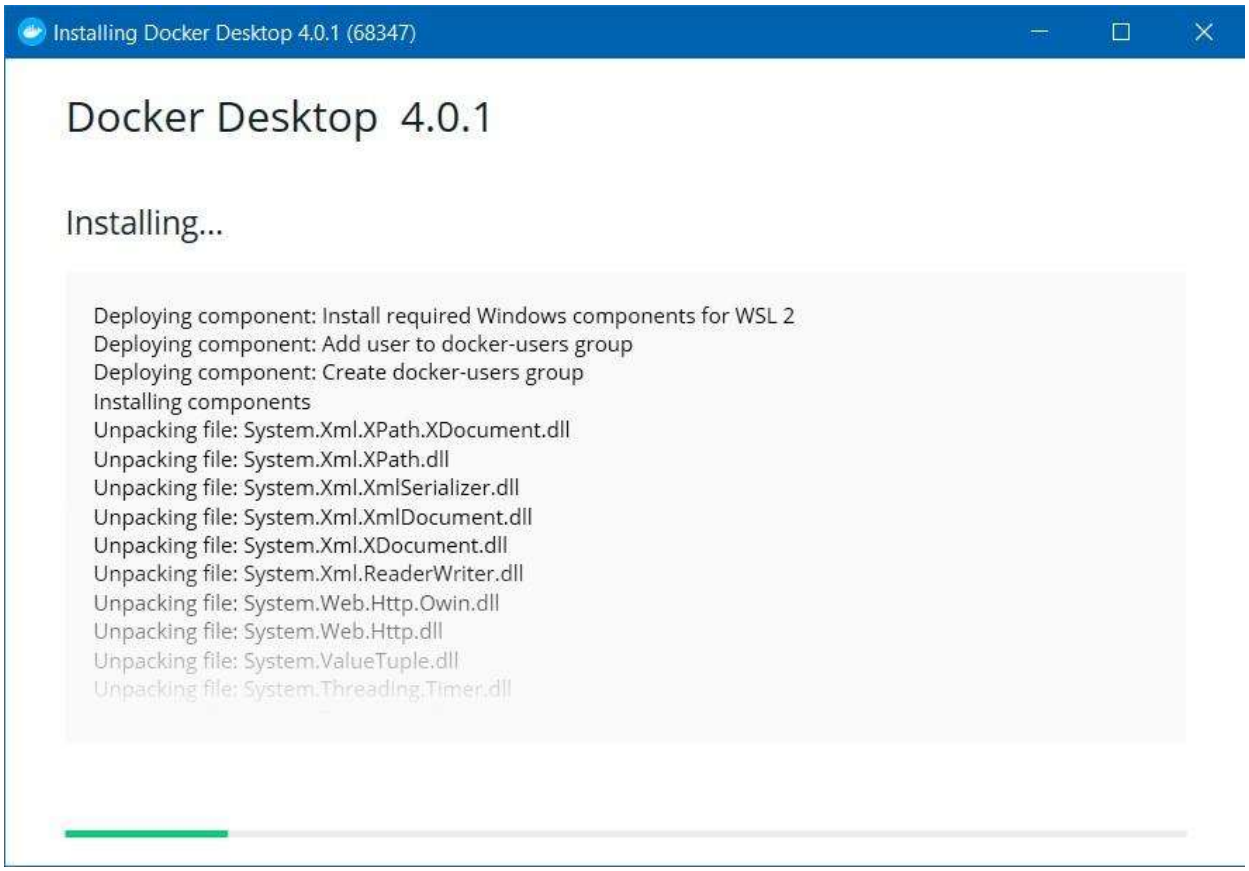
```
i#!bin/bash
echo -n "Enter year (YYYY) : "
read y
a = 'expr $y%4'
b = 'expr $y%100'
c = 'expr $y%400'
if [$a -eq 0 -a $b -ne 0 -o $c -eq 0 ]
then
echo "$y is leap year"
else
echo "$y is not leap year"

fi

~
~
~
~
~
~
~
~
~
~
~
~
~
"year.sh" 14 lines, 206 characters
```

Docker installation on Windows 10

Step-I
Download Docker desktop Installer for Windows from
https://desktop.docker.com/win/main/amd64/Docker%20Desktop%20Installer.exe

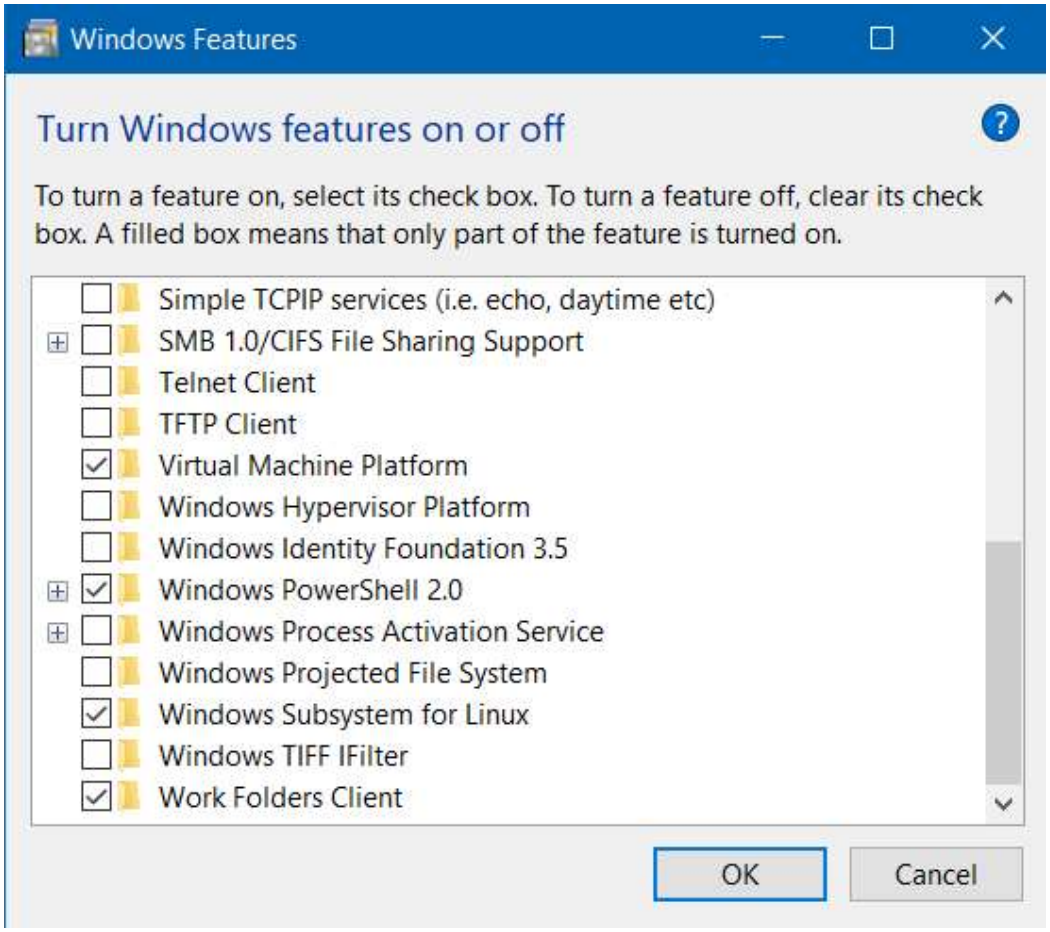


Step-II
Open the .exe file and follow the steps after clicking install button.



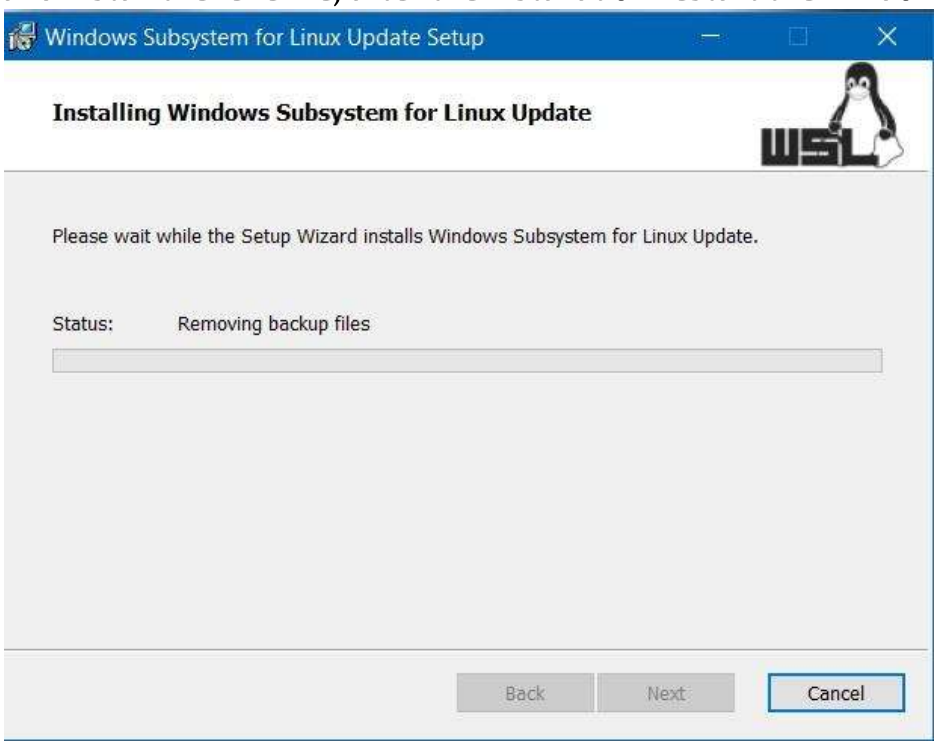
Step-III
Once installed go to programs and features and click turn on windows features on or off

Scroll to the bottom and select windows subsystem for Linux



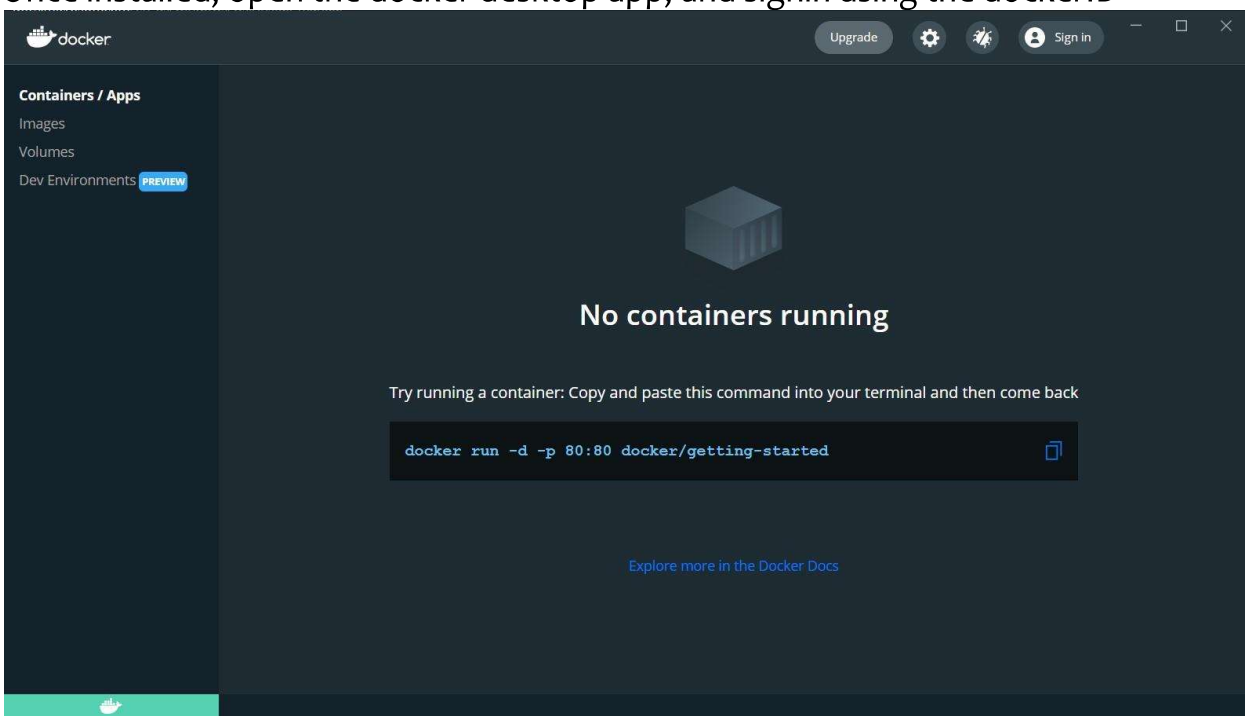
Step-IV

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



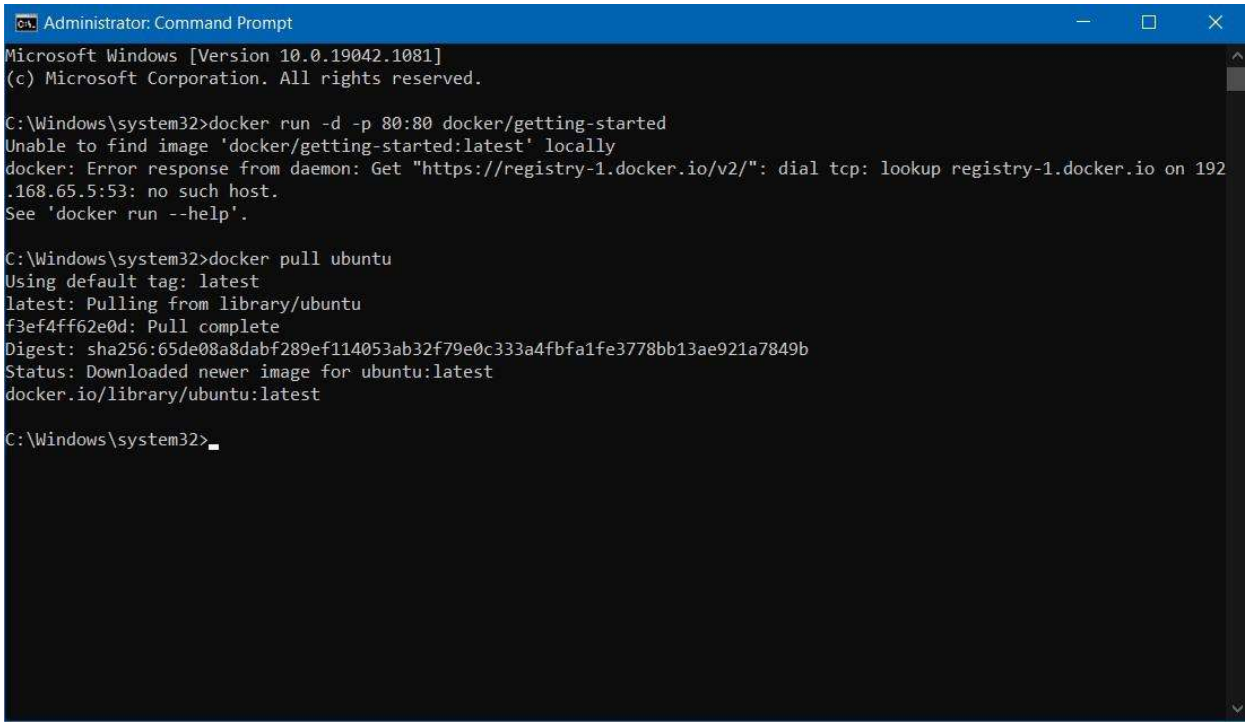
Step-V

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

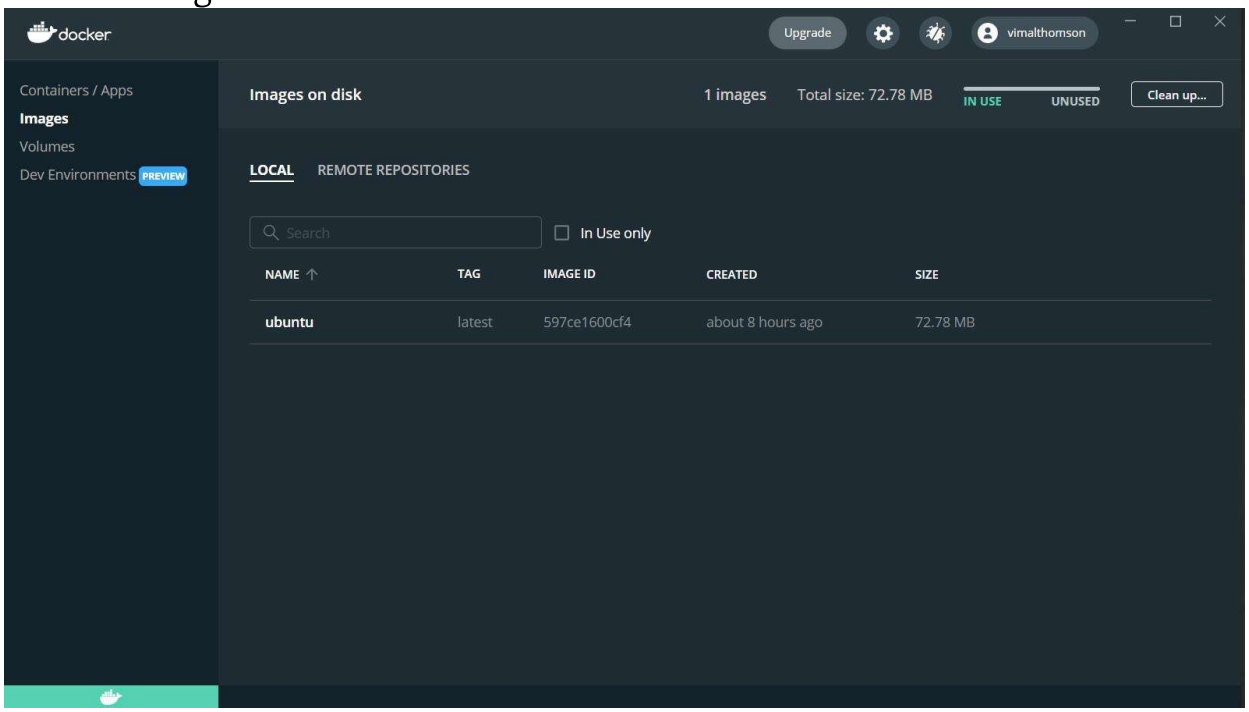


Step-VI

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



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



Wireshark installation

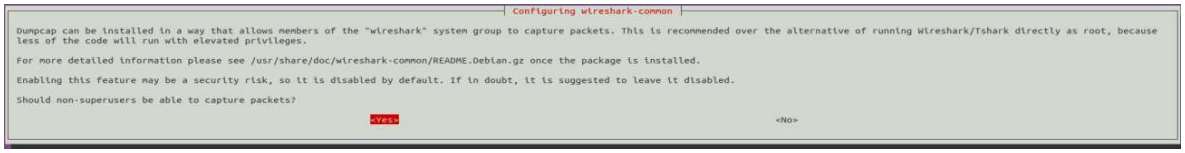
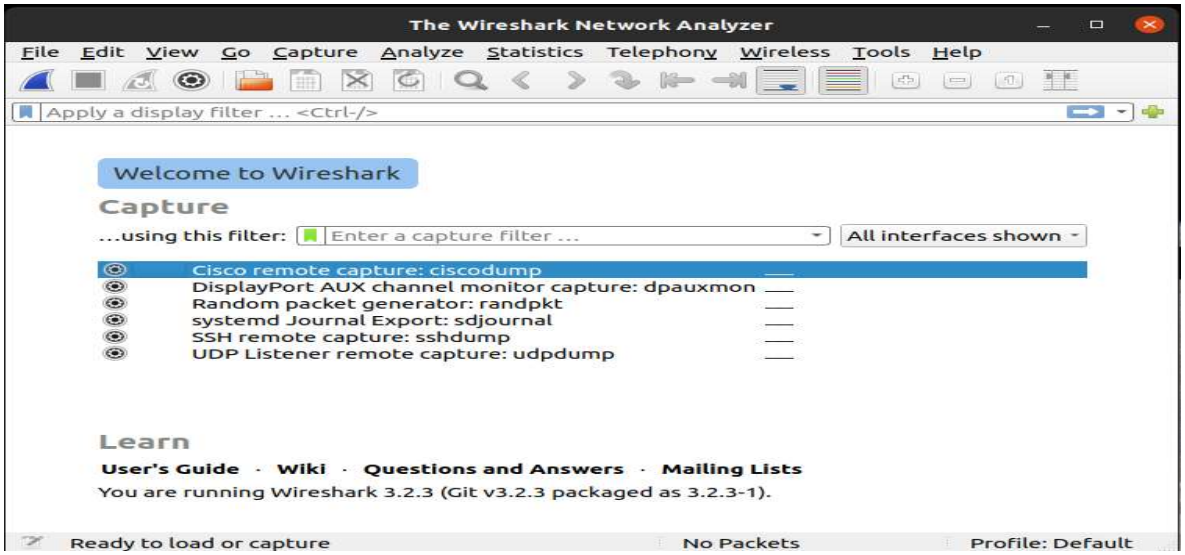
1. Command: sudo apt-get install wireshark

```
vimalthomson@vimal-thomson:~$ sudo apt-get install wireshark
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi libgstreamer-plugins-bad1.0-0 libnvidia-cfg1-460 libnvidia-common-460 l
  libnvidia-gl-460 libnvidia-ifr1-460 libva-wayland2 libx11-xcb1:i386 libxnvctrl0 nvidia-compute-utils-460 nvidia-kernel-
  xserver-xorg-video-nvidia-460
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins lib
  libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libspandsp2 libwireshark-data libwireshark13 libwiretap10 lib
  wireshark-common wireshark-qt
Suggested packages:
  qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geoipupdate geoip-database geoip-database-extra libjs-leaflet
The following NEW packages will be installed:
  libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5 libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins lib
  libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2ldbl libspandsp2 libwireshark-data libwireshark13 libwiretap10 lib
  wireshark wireshark-common wireshark-qt
0 upgraded, 27 newly installed, 0 to remove and 342 not upgraded.
Need to get 32.6 MB of archives.
After this operation, 162 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libdouble-conversion3 amd64 3.1.5-4ubuntu1 [37.9 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 libpcre2-16-0 amd64 10.34-7 [181 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5core5a amd64 5.12.8+dfsg-0ubuntu1 [2,005 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 libqt5dbus5 amd64 5.12.8+dfsg-0ubuntu1 [208 kB]
```

2. Command: sudo dkpg-reconfigure wireshark-common

```
vimalthomson@vimal-thomson:~$ sudo dpkg-reconfigure wireshark-common
vimalthomson@vimal-thomson:~$
```

3. Command: Select Yes and press enter



4. Open wireshark from the applist