

ASSIGNMENT_4

NETWORK LAB

Submitted To:

Meera Miss

Submitted By:

Radhika C

Roll No : 13

RMCA – B Batch

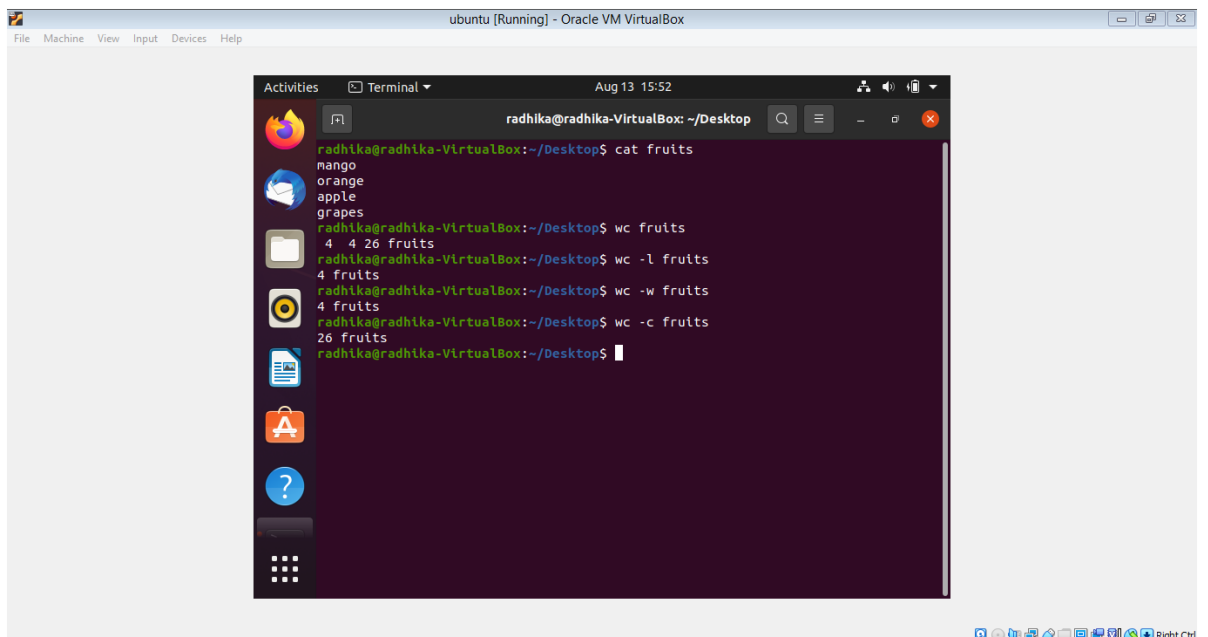
Submitted On:

12/08/2021

BASIC LINUX COMMANDS

1. 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.



The screenshot shows a terminal window titled 'radhika@radhika-VirtualBox: ~/Desktop'. The user has created a file named 'fruits' containing the following text:

```
mango
orange
apple
grapes
```

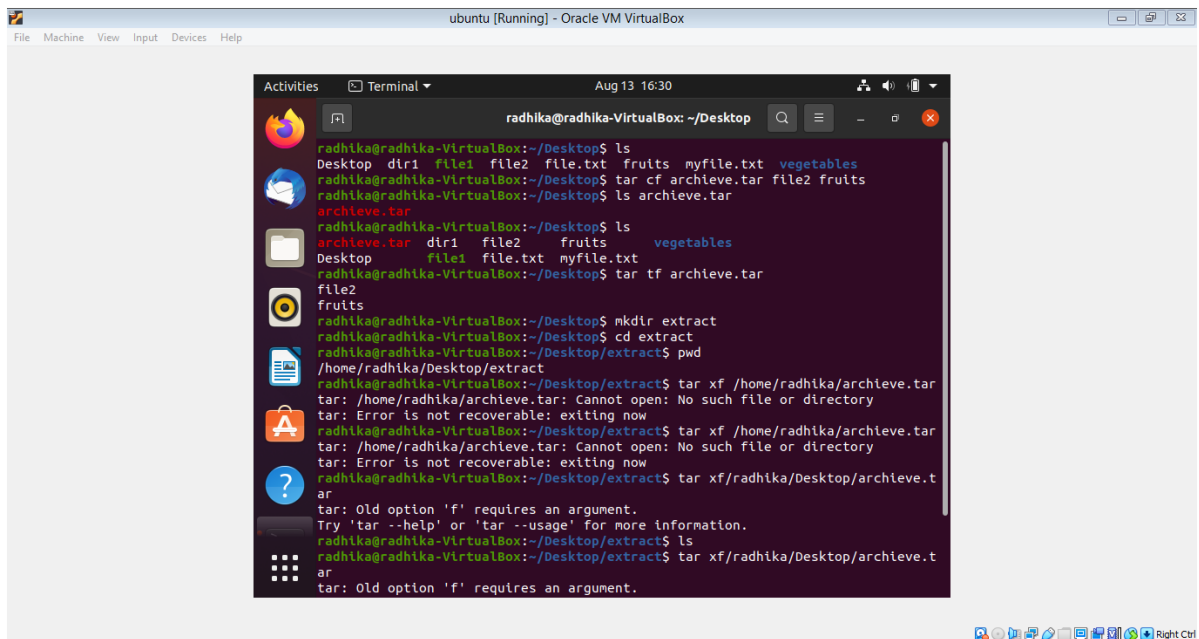
The user then runs the following commands and receives the following output:

```
radhika@radhika-VirtualBox:~/Desktop$ cat fruits
mango
orange
apple
grapes
radhika@radhika-VirtualBox:~/Desktop$ wc fruits
 4  4 26 fruits
radhika@radhika-VirtualBox:~/Desktop$ wc -l fruits
 4 fruits
radhika@radhika-VirtualBox:~/Desktop$ wc -w fruits
 4 fruits
radhika@radhika-VirtualBox:~/Desktop$ wc -c fruits
26 fruits
radhika@radhika-VirtualBox:~/Desktop$
```

The terminal window is part of an Oracle VM VirtualBox environment running Ubuntu. The window title bar shows 'ubuntu [Running] - Oracle VM VirtualBox'. The terminal window has a dark background with a light-colored text cursor. The output of the 'wc' command shows the number of lines, words, and bytes for the 'fruits' file.

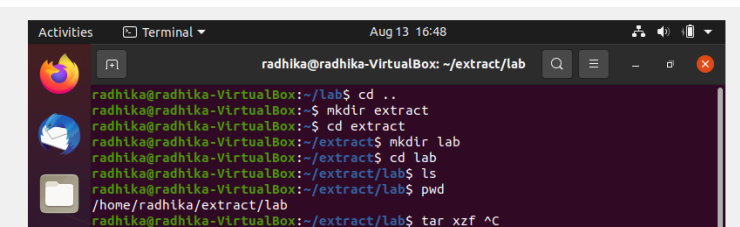
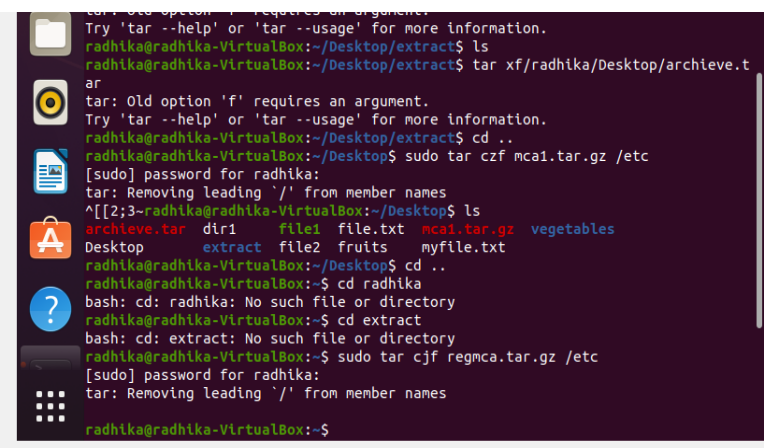
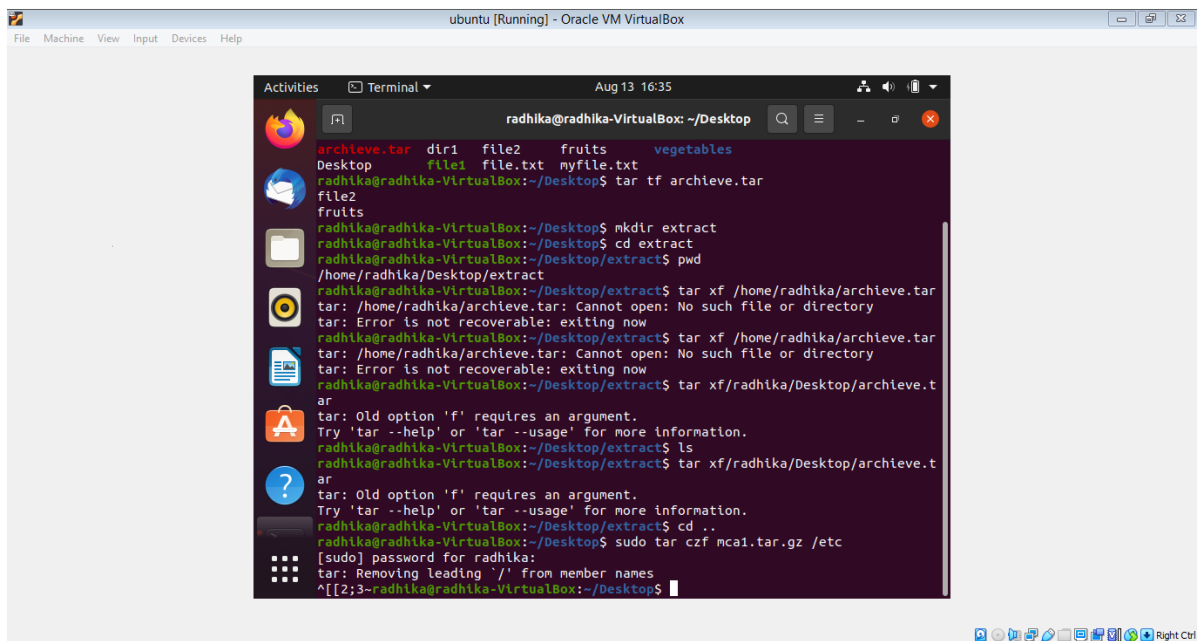
2. tar

- Stands for tape archive.
- It is used to create Archive and extract the Archive files.
- Linux tar command to create compressed or uncompressed Archive files.



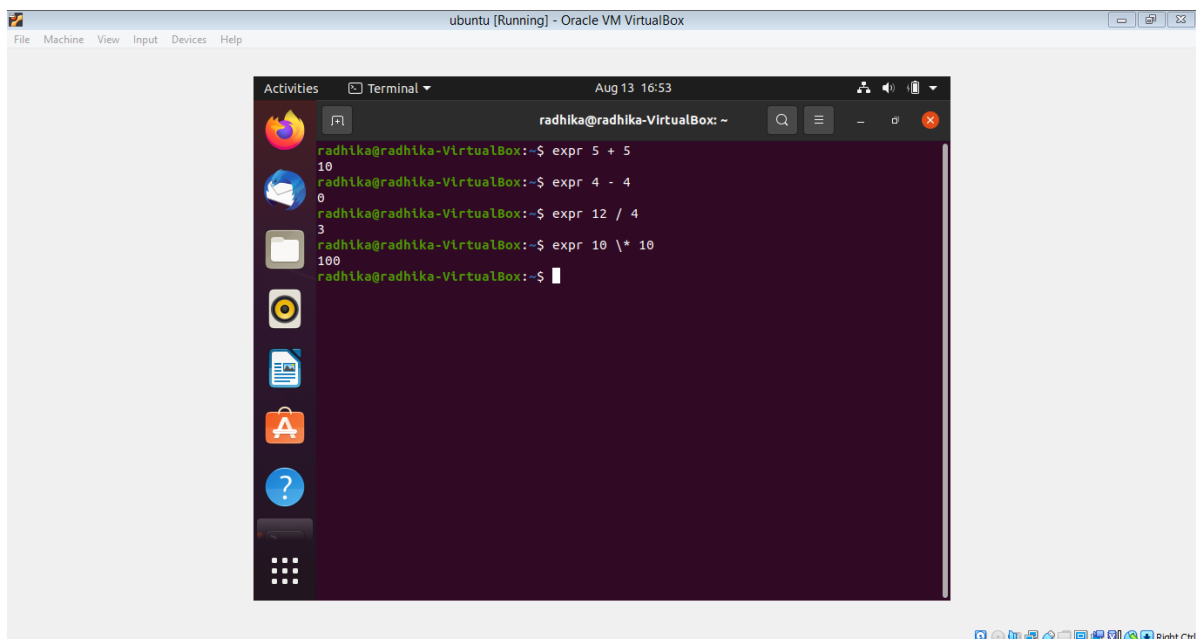
The screenshot shows a terminal window titled "radhika@radhika-VirtualBox: ~/Desktop" with the date and time "Aug 13 16:30". The terminal displays the following commands and output:

```
radhika@radhika-VirtualBox:~/Desktop$ ls
Desktop  dir1  file1  file2  file.txt  fruits  myfile.txt  vegetables
radhika@radhika-VirtualBox:~/Desktop$ tar cf archive.tar file2 fruits
radhika@radhika-VirtualBox:~/Desktop$ ls archive.tar
archive.tar
radhika@radhika-VirtualBox:~/Desktop$ ls
archive.tar  dir1  file2  fruits  vegetables
radhika@radhika-VirtualBox:~/Desktop$ tar tf archive.tar
Desktop  file1  file.txt  myfile.txt
radhika@radhika-VirtualBox:~/Desktop$ tar tf archive.tar
file2
fruits
radhika@radhika-VirtualBox:~/Desktop$ mkdir extract
radhika@radhika-VirtualBox:~/Desktop$ cd extract
radhika@radhika-VirtualBox:~/Desktop/extract$ pwd
/home/radhika/Desktop/extract
radhika@radhika-VirtualBox:~/Desktop/extract$ tar xf /home/radhika/archive.tar
tar: /home/radhika/archive.tar: Cannot open: No such file or directory
tar: Error is not recoverable: exiting now
radhika@radhika-VirtualBox:~/Desktop/extract$ tar xf /home/radhika/archive.tar
tar: /home/radhika/archive.tar: Cannot open: No such file or directory
tar: Error is not recoverable: exiting now
radhika@radhika-VirtualBox:~/Desktop/extract$ tar xf radhika/Desktop/archive.t
ar
tar: Old option 'f' requires an argument.
Try 'tar --help' or 'tar --usage' for more information.
radhika@radhika-VirtualBox:~/Desktop/extract$ ls
radhika@radhika-VirtualBox:~/Desktop/extract$ tar xf radhika/Desktop/archive.t
ar
tar: Old option 'f' requires an argument.
```



3. expr

- The `expr` command evaluates a given expression and displays its corresponding output.
- It is used for basic operations like addition, subtraction, multiplication, division, and modulus on integers.
- Evaluating regular expressions, string operations like substring, length of strings etc.
- Performing operations on variables inside a shell script.



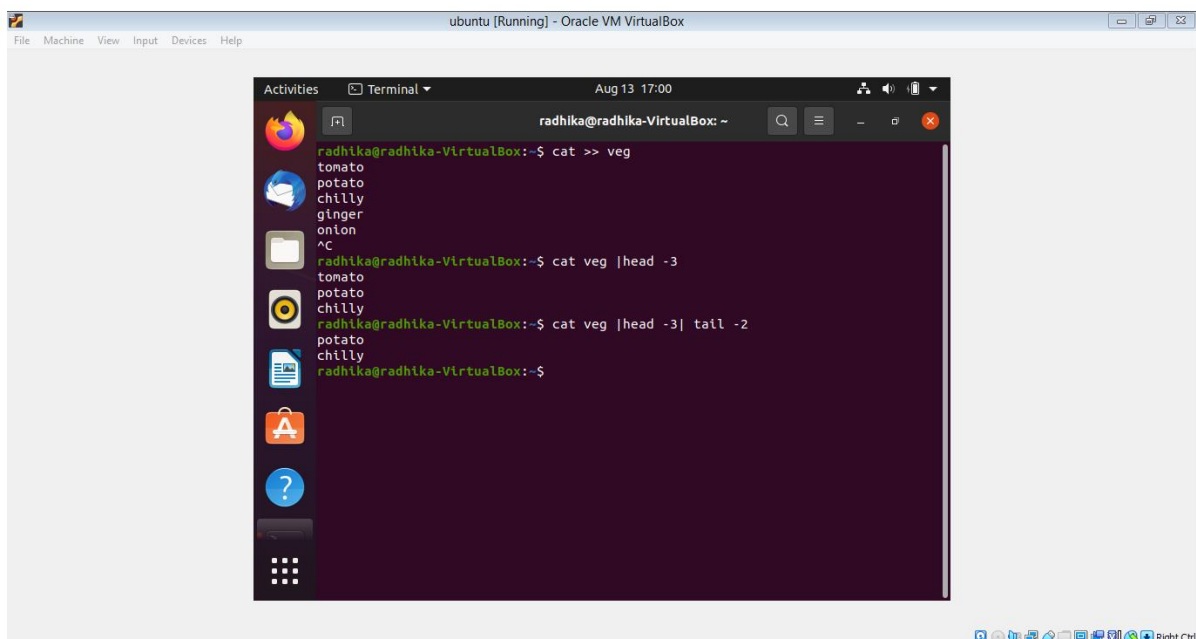
The screenshot shows a terminal window titled "radhika@radhika-VirtualBox: ~" with a dark purple background. The terminal displays the following commands and their outputs:

```
radhika@radhika-VirtualBox:~$ expr 5 + 5
10
radhika@radhika-VirtualBox:~$ expr 4 - 4
0
radhika@radhika-VirtualBox:~$ expr 12 / 4
3
radhika@radhika-VirtualBox:~$ expr 10 \* 10
100
radhika@radhika-VirtualBox:~$
```

The terminal window is part of an Ubuntu desktop environment running in Oracle VM VirtualBox. The desktop includes a sidebar with application icons (Firefox, LibreOffice, etc.) and a top menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The system clock in the top right corner shows "Aug 13 16:53".

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.



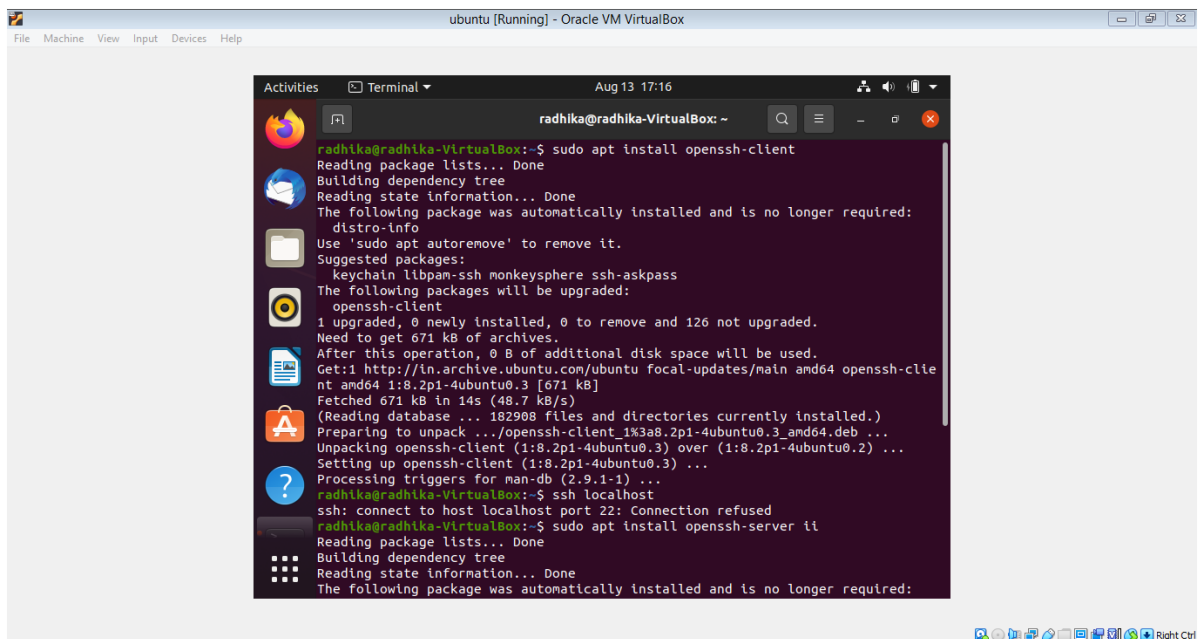
The screenshot shows a terminal window titled "radhika@radhika-VirtualBox: ~" with a dark purple background. The terminal displays the following commands and their outputs:

```
radhika@radhika-VirtualBox:~$ cat >> veg
tomato
potato
chilly
ginger
onion
^C
radhika@radhika-VirtualBox:~$ cat veg | head -3
tomato
potato
chilly
radhika@radhika-VirtualBox:~$ cat veg | head -3 | tail -2
potato
chilly
radhika@radhika-VirtualBox:~$
```

The terminal window is part of an Ubuntu [Running] - Oracle VM VirtualBox environment. The left sidebar shows the Ubuntu desktop environment with various application icons. The top of the window displays the date and time as "Aug 13 17:00".

5. ssh

- Stands for “Secure Shell”.
- It is a protocol used to securely connect to a remote server/system.
- It 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.



The screenshot shows a terminal window titled "radhika@radhika-VirtualBox: ~" with a date and time of "Aug 13 17:16". The terminal output shows the installation of openssh-client using the command `sudo apt install openssh-client`. The output includes package lists, dependency trees, and the installation progress. After the client is installed, the user attempts to connect to localhost using `ssh localhost`, which results in a "Connection refused" error. Finally, the user installs openssh-server using `sudo apt install openssh-server`, and the output shows the package lists and dependency trees for the server installation.

```
radhika@radhika-VirtualBox:~$ sudo apt install openssh-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
distro-info
Use 'sudo apt autoremove' to remove it.
Suggested packages:
  keychain libpam-ssh monkeysphere ssh-askpass
The following packages will be upgraded:
  openssh-client
1 upgraded, 0 newly installed, 0 to remove and 126 not upgraded.
Need to get 671 kB of archives.
After this operation, 0 B of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-clie
nt amd64 1:8.2p1-4ubuntu0.3 [671 kB]
Fetched 671 kB in 14s (48.7 kB/s)
(Reading database ... 182908 files and directories currently installed.)
Preparing to unpack .../openssh-client_1%3a8.2p1-4ubuntu0.3_amd64.deb ...
Unpacking openssh-client (1:8.2p1-4ubuntu0.3) over (1:8.2p1-4ubuntu0.2) ...
Setting up openssh-client (1:8.2p1-4ubuntu0.3) ...
Processing triggers for man-db (2.9.1-1) ...
radhika@radhika-VirtualBox:~$ ssh localhost
ssh: connect to host localhost port 22: Connection refused
radhika@radhika-VirtualBox:~$ sudo apt install openssh-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
```

ubuntu [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Aug 13 17:17

radhika@radhika-VirtualBox: ~

```
Unpacking openssh-client (1:8.2p1-4ubuntu0.3) over (1:8.2p1-4ubuntu0.2) ...
Setting up openssh-client (1:8.2p1-4ubuntu0.3) ...
Processing triggers for man-db (2.9.1-1) ...
radhika@radhika-VirtualBox:~$ ssh localhost
ssh: connect to host localhost port 22: Connection refused
radhika@radhika-VirtualBox:~$ sudo apt install openssh-server ii
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following package was automatically installed and is no longer required:
  distro-info
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  ncurses-term openssh-sftp-server ssh-import-id
Suggested packages:
  molly-guard monkeysphere ssh-askpass
The following NEW packages will be installed:
  ii ncurses-term openssh-server openssh-sftp-server ssh-import-id
0 upgraded, 5 newly installed, 0 to remove and 126 not upgraded.
Need to get 703 kB of archives.
After this operation, 6,058 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 ii amd64 1.8-2 [
15.3 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2
-0ubuntu2 [249 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2
-0ubuntu2 [249 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-sftp
```

Right Ctrl

ubuntu [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Activities Terminal Aug 13 17:23

radhika@radhika-VirtualBox: ~

```
Processing triggers for ufw (0.36-6) ...
Error: Timeout was reached
radhika@radhika-VirtualBox:~$ ssh localhost
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:uhqA7iVetJ1pmreHCARI4w7AA20p9UqEC0aknyryegI.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
radhika@localhost's password:
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.8.0-55-generic x86_64)

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

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

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

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

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

radhika@radhika-VirtualBox:~$
```

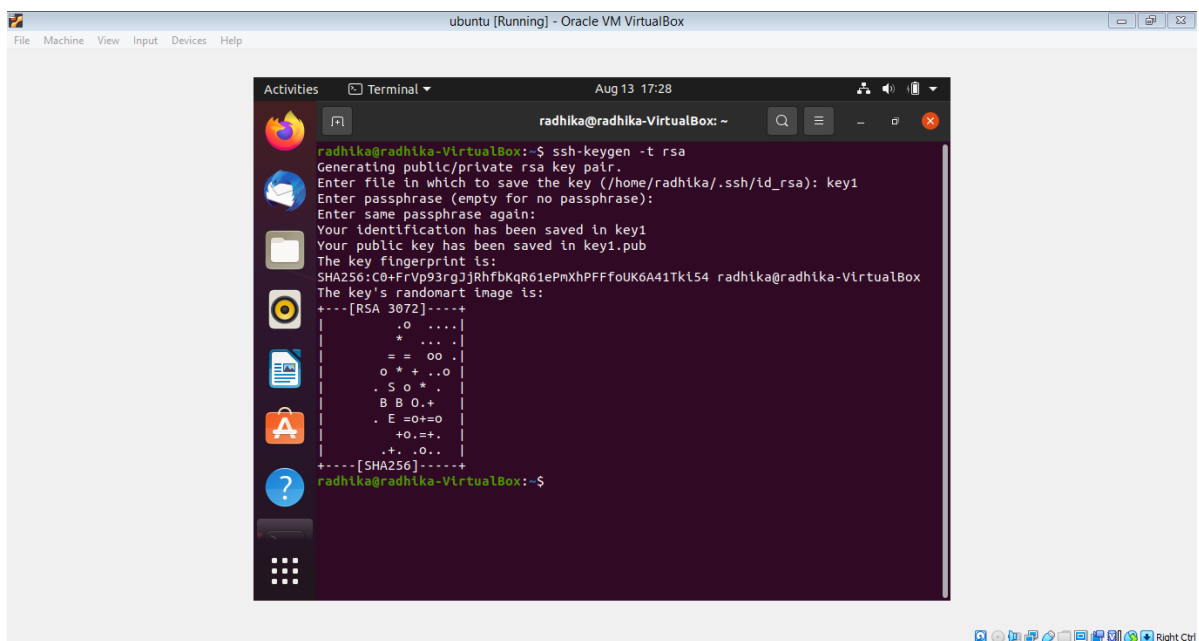
Right Ctrl

6. scp

- Stands for 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.
- Between two remote systems from your local system.
- Remote file system locations are specified in format.

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.
- `$ssh-keygen -t rsa`



The screenshot shows a terminal window titled "radhika@radhika-VirtualBox: ~" with the date and time "Aug 13 17:28". The user has entered the command `ssh-keygen -t rsa`. The terminal output shows the process of generating an RSA key pair, including prompts for the file name, passphrase, and confirmation of the key fingerprint. The key is saved in `key1` and `key1.pub`. The terminal also displays the key's fingerprint and a visual representation of the key's randomart image.

```
radhika@radhika-VirtualBox:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/radhika/.ssh/id_rsa): key1
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in key1
Your public key has been saved in key1.pub
The key fingerprint is:
SHA256:C0+FrVp93rgJJRhfbKqR61ePmXhPFFfoUK6A41Tk154 radhika@radhika-VirtualBox
The key's randomart image is:
+--[RSA 3072]-----+
|      .o      .+..+ |
|    *   +.   .+   |
|  =  +  oo .   |
| o * + .o      |
| .S o * .      |
| B B O.+       |
| .E =O+=o      |
|+.+.+.        |
|+. .o..       |
+----[SHA256]-----+
radhika@radhika-VirtualBox:~$
```

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`