

Task Day Assignment

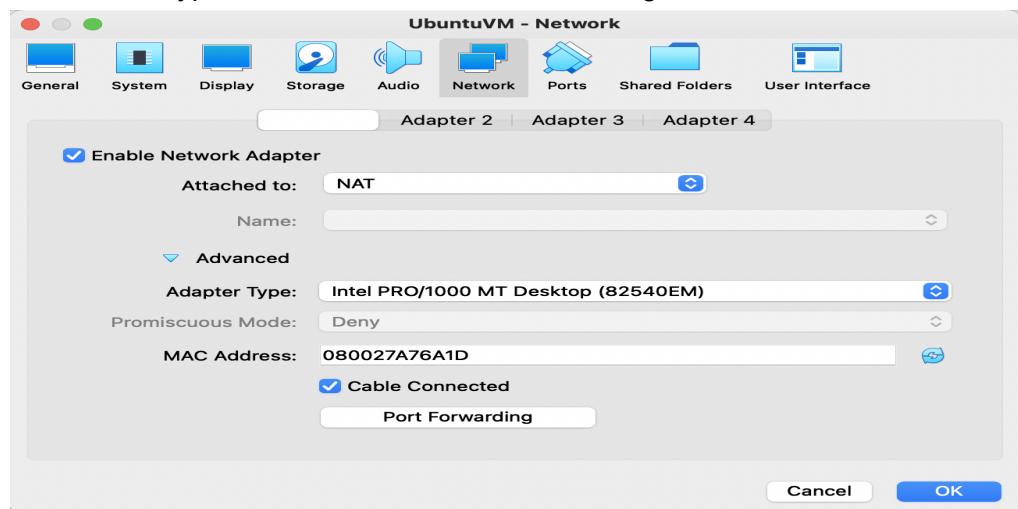
Task 1

1. How do you remote login to a machine ?

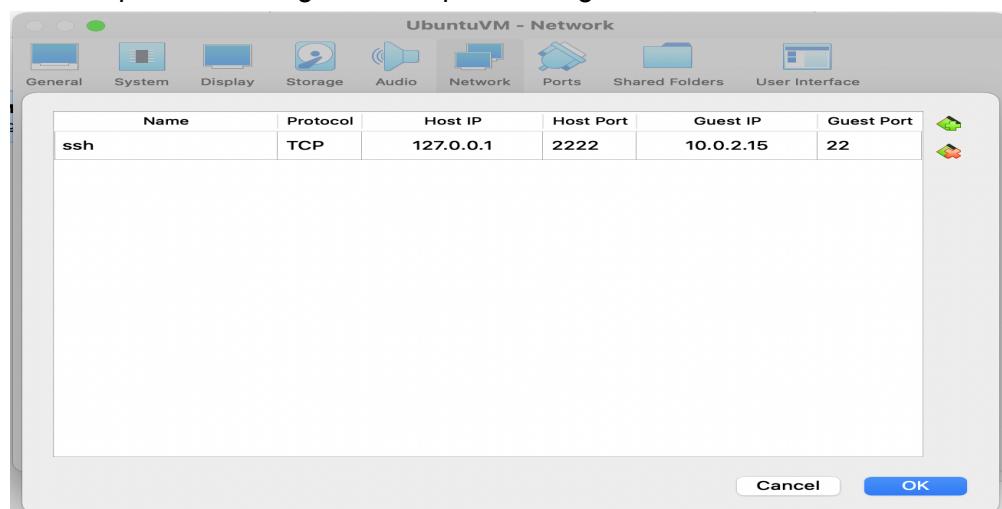
Remote login to any machine using ssh (secure shell).

Steps to setup ssh on the virtual machine

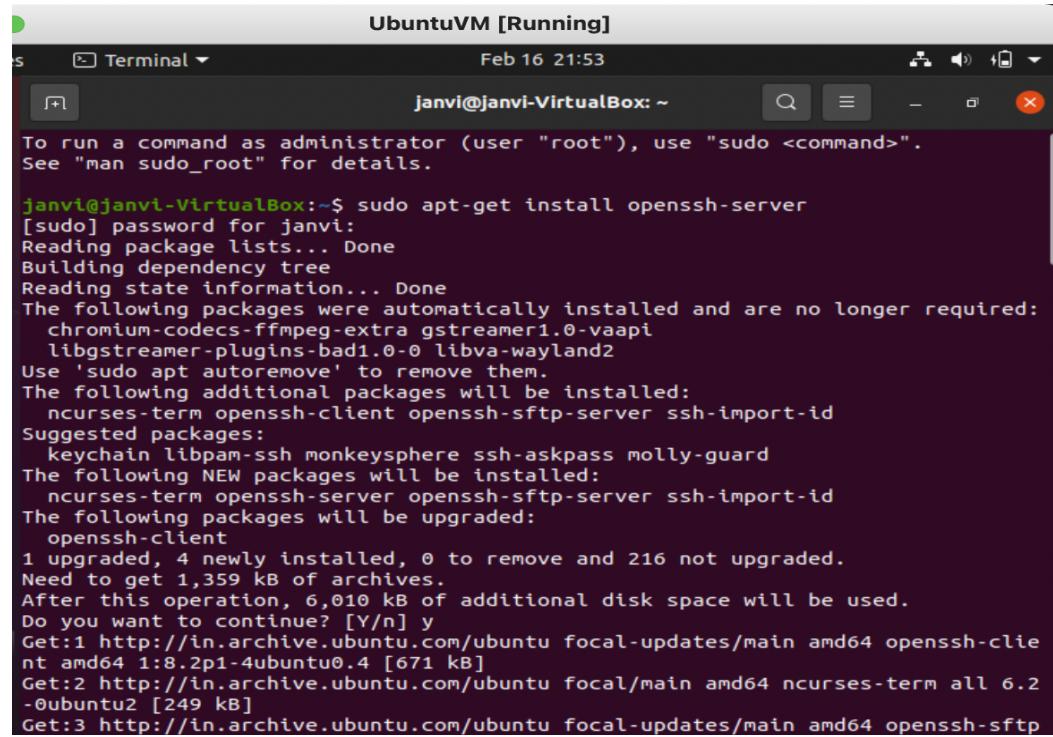
1. Install a focal VM on your virtual box.
2. Set network type to NAT under the network settings on the VM.



3. Click on port forwarding and set up the configuration.



4. Setup the virtual machine and install openssh-server on ubuntu



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

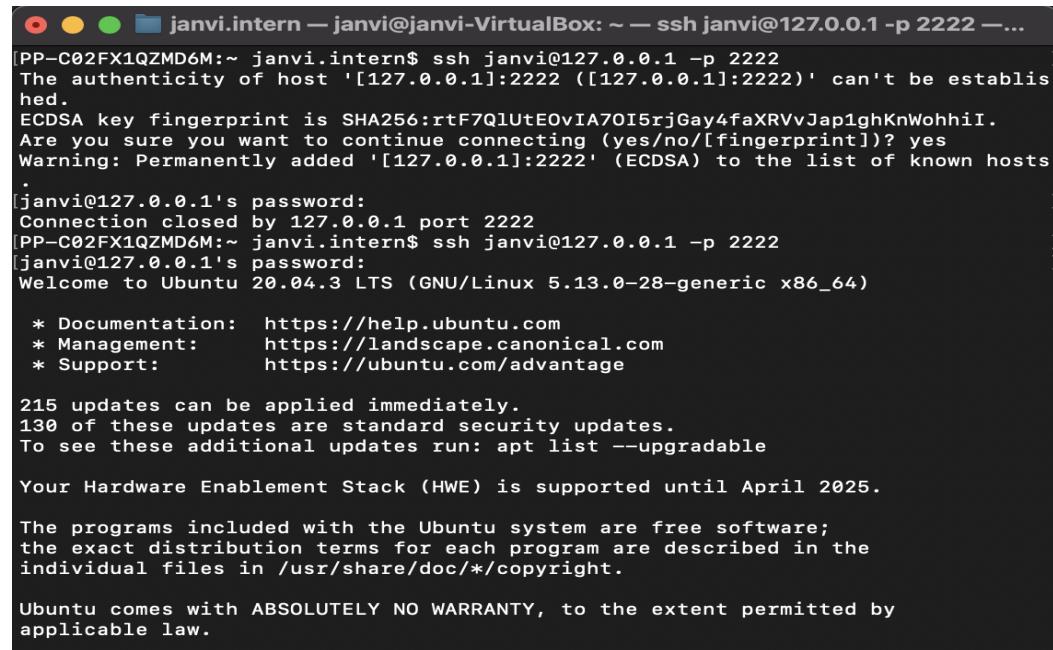
janvi@janvi-VirtualBox:~$ sudo apt-get install openssh-server
[sudo] password for janvi:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi
  libgstreamer-plugins-bad1.0-0 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ncurses-term openssh-client openssh-sftp-server ssh-import-id
Suggested packages:
  keychain libpam-ssh monkeysphere ssh-askpass molly-guard
The following NEW packages will be installed:
  ncurses-term openssh-server openssh-sftp-server ssh-import-id
The following packages will be upgraded:
  openssh-client
1 upgraded, 4 newly installed, 0 to remove and 216 not upgraded.
Need to get 1,359 kB of archives.
After this operation, 6,010 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-client amd64 1:8.2p1-4ubuntu0.4 [671 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 ncurses-term all 6.2-0ubuntu2 [249 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 openssh-sftp
```

5. Start the SSH service.



```
janvi@janvi-VirtualBox:~$ sudo service ssh start
```

6. Try to access your ubuntu virtual machine from the mac terminal by using the following command



```
[PP-C02FX1QZMD6M:~ janvi.intern$ ssh janvi@127.0.0.1 -p 2222 —...
[PP-C02FX1QZMD6M:~ janvi.intern$ The authenticity of host '[127.0.0.1]:2222 ([127.0.0.1]:2222)' can't be established.
[PP-C02FX1QZMD6M:~ janvi.intern$ ECDSA key fingerprint is SHA256:rtF7QlUtE0vIA70I5rjGay4faXRVvJapighKnWohhi.
[PP-C02FX1QZMD6M:~ janvi.intern$ Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
[PP-C02FX1QZMD6M:~ janvi.intern$ Warning: Permanently added '[127.0.0.1]:2222' (ECDSA) to the list of known hosts
[PP-C02FX1QZMD6M:~ janvi.intern$ .
[PP-C02FX1QZMD6M:~ janvi.intern$ janvi@127.0.0.1's password:
[PP-C02FX1QZMD6M:~ janvi.intern$ Connection closed by 127.0.0.1 port 2222
[PP-C02FX1QZMD6M:~ janvi.intern$ ssh janvi@127.0.0.1 -p 2222
[PP-C02FX1QZMD6M:~ janvi.intern$ .
[PP-C02FX1QZMD6M:~ janvi.intern$ janvi@127.0.0.1's password:
[PP-C02FX1QZMD6M:~ janvi.intern$ Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.13.0-28-generic x86_64)

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

[PP-C02FX1QZMD6M:~ janvi.intern$ 215 updates can be applied immediately.
[PP-C02FX1QZMD6M:~ janvi.intern$ 130 of these updates are standard security updates.
[PP-C02FX1QZMD6M:~ janvi.intern$ To see these additional updates run: apt list --upgradable

[PP-C02FX1QZMD6M:~ janvi.intern$ Your Hardware Enablement Stack (HWE) is supported until April 2025.

[PP-C02FX1QZMD6M:~ janvi.intern$ The programs included with the Ubuntu system are free software;
[PP-C02FX1QZMD6M:~ janvi.intern$ the exact distribution terms for each program are described in the
[PP-C02FX1QZMD6M:~ janvi.intern$ individual files in /usr/share/doc/*/*copyright.

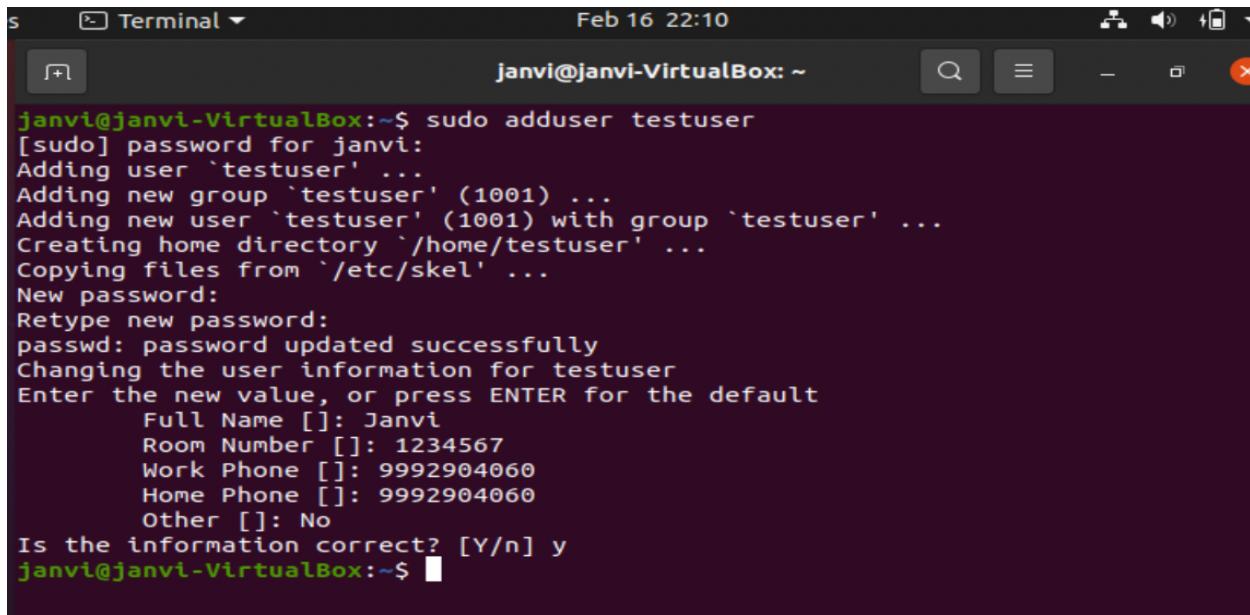
[PP-C02FX1QZMD6M:~ janvi.intern$ Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
[PP-C02FX1QZMD6M:~ janvi.intern$ applicable law.
```

We're Good to go.

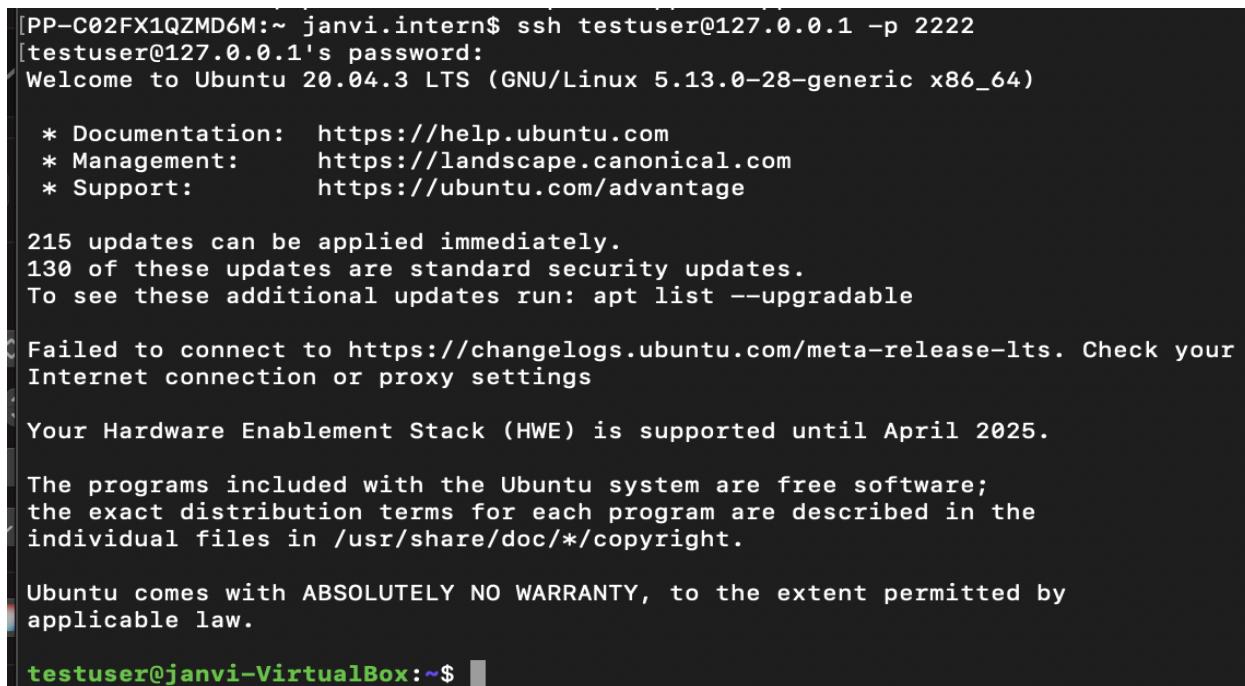
2. Create a user testuser with some password and try to ssh using that user ?

Step 1: Add a new user using sudo adduser testuser.

Step 2: Try to ssh that using the user from the host machine terminal.



```
janvi@janvi-VirtualBox:~$ sudo adduser testuser
[sudo] password for janvi:
Adding user `testuser' ...
Adding new group `testuser' (1001) ...
Adding new user `testuser' (1001) with group `testuser' ...
Creating home directory `/home/testuser' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for testuser
Enter the new value, or press ENTER for the default
      Full Name []: Janvi
      Room Number []: 1234567
      Work Phone []: 9992904060
      Home Phone []: 9992904060
      Other []: No
Is the information correct? [Y/n] y
janvi@janvi-VirtualBox:~$
```



```
[PP-C02FX1QZMD6M:~ janvi.intern$ ssh testuser@127.0.0.1 -p 2222
[ testuser@127.0.0.1's password:
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.13.0-28-generic x86_64)

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

215 updates can be applied immediately.
130 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your
Internet connection or proxy settings

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.

testuser@janvi-VirtualBox:~$
```

3. Try enabling passwordless ssh using certs?

1. Generate a 4096 key-pair.

```
Ssh-keygen -t rsa -b 4096 -C "janvimadhu06@gmail.com"
```

```
[PP-C02FX1QZMD6M:~ janvi.intern$ ssh-keygen -t rsa -b 4096 -C "janvimadhu06@gmail.com"
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/janvi.intern/.ssh/id_rsa):
[Enter passphrase (empty for no passphrase):
[Enter same passphrase again:
Your identification has been saved in /Users/janvi.intern/.ssh/id_rsa.
Your public key has been saved in /Users/janvi.intern/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:H441NAe6JLWgmIwHqPVl5hSqeSWLlmaFpy7mRI8Pg janvimadhu06@gmail.com
The key's randomart image is:
+---[RSA 4096]---+
|       . . .
|       o o o o .
| +oo+ + + o .
| ==Bo . + + o
| +Xo... . S +
| B=0 . = o
| +OE     . o
| .o.
| ..
+---[SHA256]---+
[PP-C02FX1QZMD6M:~ janvi.intern$ cd /Users/janvi.intern/.ssh/
[PP-C02FX1QZMD6M:.ssh janvi.intern$ ls
id_rsa      id_rsa.pub      known_hosts
[PP-C02FX1QZMD6M:.ssh janvi.intern$ ssh-copy-id -i /Users/janvi.intern/.ssh/id_rs
a.pub janvi@127.0.0.1 -p 2222
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/Users/janvi.inte
rn/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
[janvi@127.0.0.1's password:
Number of key(s) added:          1

Now try logging into the machine, with:  "ssh -p '2222' 'janvi@127.0.0.1'"
and check to make sure that only the key(s) you wanted were added.

PP-C02FX1QZMD6M:.ssh janvi.intern$ ]
```

4. Create a file with “root” user and verify the permission of the file.

- Be the root user using the command sudo su root
- Create a file.

```
janvi@janvi-VirtualBox:~$ sudo su root
[sudo] password for janvi:
root@janvi-VirtualBox:/home/janvi# touch file123.txt
root@janvi-VirtualBox:/home/janvi# vi file123.txt
root@janvi-VirtualBox:/home/janvi# ls -l file.txt
-rw-rw-r-- 1 janvi janvi 17 Feb 16 22:22 file.txt
root@janvi-VirtualBox:/home/janvi# cd
root@janvi-VirtualBox:~/# touch file1234.txt
root@janvi-VirtualBox:~/# vi file1234.txt
```

- Using ls -l you can check the permissions.

```
root@janvi-VirtualBox:~/# ls -l file1234.txt
-rw-r--r-- 1 root root 8 Feb 16 22:26 file1234.txt
root@janvi-VirtualBox:~/#
```

- In order if you want to change the permissions you can use the chmod command to change the permission of user , owner and group .

In case as a root user you wish to change the permissions use:

chmod <for-whom: ugoa><+-=><rwx> file_name

5. Change the Ownership of the file of the newly created testuser.

- We can change the ownership using the chown command which means change owner. We can assign the ownership to the different user and group and can also assign or change the permission.
- For owner change only - use chown <owner-you-wish-to-assign> <file-name>

```
root@janvi-VirtualBox:~/# chown testuser file1234.txt
root@janvi-VirtualBox:~/# ls
file1234.txt snap
root@janvi-VirtualBox:~/# ls -l
total 8
-rw-r--r-- 1 testuser root 8 Feb 16 22:26 file1234.txt
drwxr-xr-x 3 root root 4096 Feb 16 21:43 snap
root@janvi-VirtualBox:~/#
```

6. Now delete the test user

- To delete the user we need to logout from that user. Become the root user and kill all the processes running on that user before deleting the user.
- This can be using the command sudo killall -u testuser
- Remove the user now using userdel testuser .

```
root@janvi-VirtualBox:~/# sudo killall -u testuser
root@janvi-VirtualBox:~/# userdel testuser
```

Task 2

1. Install any package of your choice lets (ex mariadb / nginx / elasticsearch)

Step 1: Update the Package using sudo apt-get update or sudo apt update.

```
janvi@janvi-VirtualBox:~$ sudo apt-get update
[sudo] password for janvi:
Get:1 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:2 http://us.archive.ubuntu.com/ubuntu focal InRelease
Get:3 http://security.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [9,564 B]
Get:4 http://us.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:5 http://us.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Fetched 346 kB in 2s (140 kB/s)
Reading package lists... Done
janvi@janvi-VirtualBox:~$
```

Step 2: Install the nginx using sudo apt-get install nginx or sudo apt instal nginx.

```
janvi@janvi-VirtualBox:~$ sudo apt-get install nginx
Reading package lists... Done
Building dependency tree
```

Step 3: Nginx is installed. You can check the version and configure it. Check the version using nginx -v .

```
janvi@janvi-VirtualBox:~$ nginx -v
nginx version: nginx/1.18.0 (Ubuntu)
```

2. Uninstall the same. Verify if some config files of the same are present if yes ? then how will you remove them (using package manager only)?

Step 1 : For uninstalling the nginx we have to use the below command on the terminal.

The package manager provides two ways to uninstall the nginx.

1. Remove - sudo apt-get remove nginx or sudo apt remove nginx
2. Purge - sudo apt-get purge nginx or sudo apt purge nginx.

Remove will uninstall the nginx but will have some configuration files left behind.

In order to completely uninstall it. Use the purge command. or reinstall nginx using sudo apt reinstall nginx This will uninstall all the files and reinstall the configuration..

Task 3

1. Check how much free disk is available and also ensure that the command prints the files system of the mount points ?

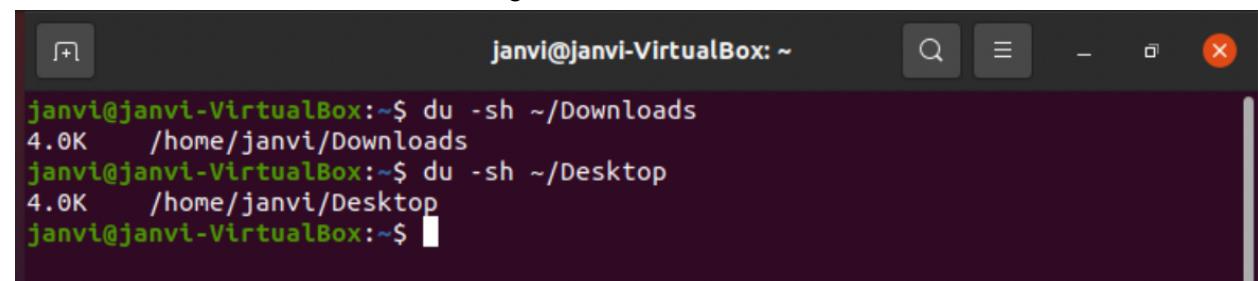
```
df -h
try or help for more information.
janvi@janvi-VirtualBox:~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            454M    0   454M   0% /dev
tmpfs           98M  1.4M   96M   2% /run
/dev/sda5       9.3G  6.9G  1.9G  79% /
tmpfs           486M    0   486M   0% /dev/shm
tmpfs           5.0M  4.0K   5.0M   1% /run/lock
tmpfs           486M    0   486M   0% /sys/fs/cgroup
/dev/loop0       56M   56M    0 100% /snap/core18/2128
/dev/loop1       219M  219M    0 100% /snap/gnome-3-34-1804/72
/dev/loop2       33M   33M    0 100% /snap/snapd/12704
/dev/loop3       66M   66M    0 100% /snap/gtk-common-themes/1515
/dev/loop4       51M   51M    0 100% /snap/snap-store/547
/dev/sda1       511M  4.0K  511M   1% /boot/efi
tmpfs           98M  92K   98M   1% /run/user/1000
```

2. Check how much disk is used by a particular directory ?

du - disk usage command is used to check how much disk is used by a particular directory.

-sh is for summarizing and human readable format.

The command is written in the following format.



A screenshot of a terminal window titled "janvi@janvi-VirtualBox: ~". The window shows two commands being run: "du -sh ~/Downloads" and "du -sh ~/Desktop". Both commands output "4.0K" followed by the path to the respective directory. The terminal has a dark theme with light-colored text and a standard window interface.

```
janvi@janvi-VirtualBox:~$ du -sh ~/Downloads
4.0K  /home/janvi/Downloads
janvi@janvi-VirtualBox:~$ du -sh ~/Desktop
4.0K  /home/janvi/Desktop
janvi@janvi-VirtualBox:~$
```

3. List all the files in a directory along with the hidden files?

Step 1: cd into the directory you want to get into.

Step 2: use the ls -la command for the long listing format of files in the directory along with the hidden file. Here, -l option is for long listing and -a is for viewing the hidden files.

```
janvi@janvi-VirtualBox:~$ cd Desktop
janvi@janvi-VirtualBox:~/Desktop$ ls -la
total 52
drwxr-xr-x  5 janvi janvi 4096 Feb 16 07:33 .
drwxr-xr-x 18 janvi janvi 4096 Feb 16 06:54 ..
-rw-rw-r--  1 janvi janvi  428 Feb 16 06:56 case.sh
-rw-rw-r--  1 janvi janvi    0 Feb 16 05:42 create_file
-rw-r--r--  1 root  root  289 Feb 16 05:50 direc_check_script.sh
drwxrwxr-x  2 janvi janvi 4096 Feb 16 05:50 directory_check
-rw-rw-r--  1 janvi janvi   48 Feb 16 05:37 file2
-? Help      1 root  root  437 Feb 16 05:43 file_check_script.sh
-rw-r--r--  1 janvi janvi   13 Feb 16 05:45 filecreate
-rw-r--r--  1 janvi janvi   58 Feb 16 04:40 file.txt
drwxrwxr-x  2 janvi janvi 4096 Feb 16 05:09 hello
drwxrwxr-x  2 janvi janvi 4096 Feb 15 11:06 influxdb2-2.1.1-linux-amd64
-rw-r--r--  1 root  root  451 Feb 16 04:59 replace.sh
-rwxr-xr-x  1 root  root  191 Feb 16 02:16 script.sh
```

4. How do you check the ram in the system ?

To check RAM on the System using Terminal we can use free or vmstat command

1. Using free

Actual memory (RAM) and swap memory.

```
janvi@janvi-VirtualBox:~$ free
              total        used        free      shared  buff/cache   available
Mem:       2819144      896544     162036        2616     1760564      1736848
Swap:      459260        4120     455140
```

In the details of free :

Total - shows total amount of memory on the system

Used - amount of RAM currently used on your system in kbs

Free - the amount of free memory available on system in kbs

Shared - memory used by temporary files that appear to be mounted.

Buffers/cache - memory used by kernel buffers,page cache

Available - memory available on the system in kbs

If we use ls -h , we can have the data in the human readable format.

5. How to list all the open ports on the server ?

To list all the open ports on the server we can have a number of ways and command that can help us do the same.

1.lsof command - sudo lsof -nP | grep LISTEN for all the open sockets.

```
janvi@janvi-VirtualBox:~$ sudo lsof -nP | grep LISTEN
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1000/gvfs
      Output information may be incomplete.
lsof: WARNING: can't stat() fuse file system /run/user/1000/doc
      Output information may be incomplete.
cupsd      582                           root    6u      IPv6          24
151      0t0      TCP  [::1]:631  (LISTEN)
cupsd      582                           root    7u      IPv4          24
152      0t0      TCP 127.0.0.1:631  (LISTEN)
zebra     716                           frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
zebra     716  717 RCU\x20sw           frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
zebra     716  718 zebra_dpl          frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
zebra     716  752 zebra_api         frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
zebra     716  753 zebra_api         frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
zebra     716  758 zebra_api         frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
zebra     716  769 zebra_api         frr    19u      IPv4          24
739      0t0      TCP 127.0.0.1:2601 (LISTEN)
bgpd      748                           frr    17u      IPv4          24
506      0t0      TCP 127.0.0.1:2605 (LISTEN)
bgpd      748  749 RCU\x20sw           frr    17u      IPv4          24
506      0t0      TCP 127.0.0.1:2605 (LISTEN)
```

For only the TCP ports :

sudo lsof -i TCP

For only the UDP ports:

Sudo lsof -i UDP

2. nmap tool

This helps to find open ports on the host using sudo nmap localhost .

```
janvi@janvi-VirtualBox:~$ sudo nmap localhost
Starting Nmap 7.80 ( https://nmap.org ) at 2022-02-16 08:34 EST
Nmap scan report for localhost (127.0.0.1)
Host is up (0.0000030s latency).
Not shown: 994 closed ports
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
631/tcp   open  ipp
2601/tcp  open  zebra
2604/tcp  open  ospfd
2605/tcp  open  bgpd

Nmap done: 1 IP address (1 host up) scanned in 0.10 seconds
```

3. Netstat - sudo netstat -l provides a list of tcp and udp ports with all the details.

Command - sudo netstat -l

For tcp specifically - sudo netstat -lt

For udp specifically - sudo netstat -lu

4. ss tool - this helps in listing all the listening ports on the linux system

Netid	State	Recv-Q	Send-Q	Peer Address:Port	Local Address:Process
Port					
nl	UNCONN	0	0	*	rtndl:
xdg-desktop-por	/50410				
nl	UNCONN	0	0	*	rtndl:
kernel				*	
nl	UNCONN	0	0	*	rtndl:
gnome-calendar	/1753			*	
nl	UNCONN	0	0	*	rtndl:
evolution-addre	/1535			*	
nl	UNCONN	0	0	*	rtndl:
evolution-calen	/1524			*	
nl	UNCONN	0	0	*	rtndl:
goa-daemon	/1308			*	
nl	UNCONN	0	0	*	rtndl:
avahi-daemon	/579			*	
nl	UNCONN	0	0	*	rtndl:
- Show Applications					
nl	UNCONN	0	0	*	rtndl:

6. Create a file and ensure that even root cannot edit it.

- Switch to the root user.
- Create a file.
- Use the command chattr -i <file-name> .
- This command makes the file immutable and now you can even try to edit it but it will show operations not permitted. And that's why now even root cannot edit it.

chattr +i file.txt

```
janvi@janvi-VirtualBox:~$ sudo su root
[sudo] password for janvi:
root@janvi-VirtualBox:/home/janvi# cd
root@janvi-VirtualBox:~/# touch file.txt
root@janvi-VirtualBox:~/# ls
file1234.txt  file.txt  snap
root@janvi-VirtualBox:~/# vim file.txt

Command 'vim' not found, but can be installed with:

apt install vim          # version 2:8.1.2269-1ubuntu5.7, or
apt install vim-tiny      # version 2:8.1.2269-1ubuntu5.7
apt install neovim        # version 0.4.3-3
apt install vim-athena    # version 2:8.1.2269-1ubuntu5.7
apt install vim-gtk3       # version 2:8.1.2269-1ubuntu5.7
apt install vim-nox        # version 2:8.1.2269-1ubuntu5.7

root@janvi-VirtualBox:~/# nano file.txt
root@janvi-VirtualBox:~/# ls
file1234.txt  file.txt  snap
root@janvi-VirtualBox:~/# ls -la file.txt
-rw-r--r-- 1 root root 14 Feb 16 23:57 file.txt
root@janvi-VirtualBox:~/# chattr +i file.txt
root@janvi-VirtualBox:~/# ls -la file.txt
-r--r--r-- 1 root root 14 Feb 16 23:57 file.txt
r Show Applications alBox:~/# nano file.txt
root@janvi-VirtualBox:~/#
```

```
root@janvi-VirtualBox: ~
GNU nano 4.8
file.txt
Modified
hello world!
hello!

[ Error writing file.txt: Operation not permitted ]
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify
^X Exit     ^R Read File  ^H Replace  ^U Paste Text  ^T To Spell
```

Task 4

1. How to start, stop and reload a service in systemd?

Systemctl is the tool that is provided by the systemd which helps in doing these operations on the service.

Start:

Using this command , we can start the services for starting one or more units specified on the command line.

Syntax: Sudo systemctl start service.service

Stop:

The command stop serves for stopping the service of one or more units specified on the command line.

Syntax: sudo systemctl stop service.service

Reload:

Syntax: sudo systemctl daemon-reload

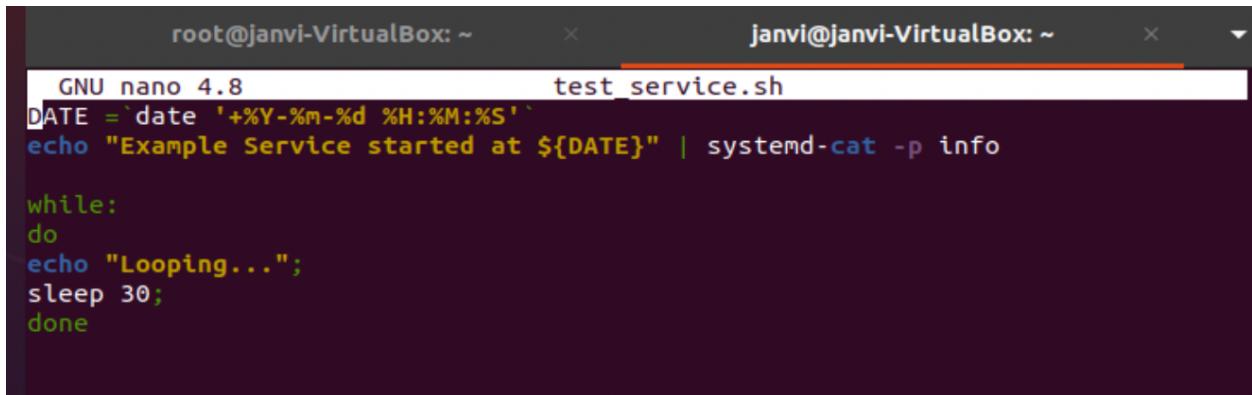
2. Create one service in systemd then try to manage it via systemctl commands

Let's create one service :

1. Create the script file that needs to be run via this service.
2. cd /etc/systemd/system
3. Create a file named <your-service>.service and include these things below.

```
janvi@janvi-VirtualBox:~$ touch test_service.sh
janvi@janvi-VirtualBox:~$ nano test_service.sh
janvi@janvi-VirtualBox:~$ sudo cp test_service.sh /usr/bin/test_service.sh
[sudo] password for janvi:
janvi@janvi-VirtualBox:~$ sudo chmod +x /usr/bin/test_service.sh
janvi@janvi-VirtualBox:~$ cd /etc/systemd/system
janvi@janvi-VirtualBox:/etc/systemd/system$ touch myservice.service
touch: cannot touch 'myservice.service': Permission denied
janvi@janvi-VirtualBox:/etc/systemd/system$ sudo nano myservice.service
janvi@janvi-VirtualBox:/etc/systemd/system$ sudo chmod 644 /etc/systemd/system/
myservice.service
janvi@janvi-VirtualBox:/etc/systemd/system$ ls -la myservice.service
-rw-r--r-- 1 root root 150 Feb 17 01:23 myservice.service
```

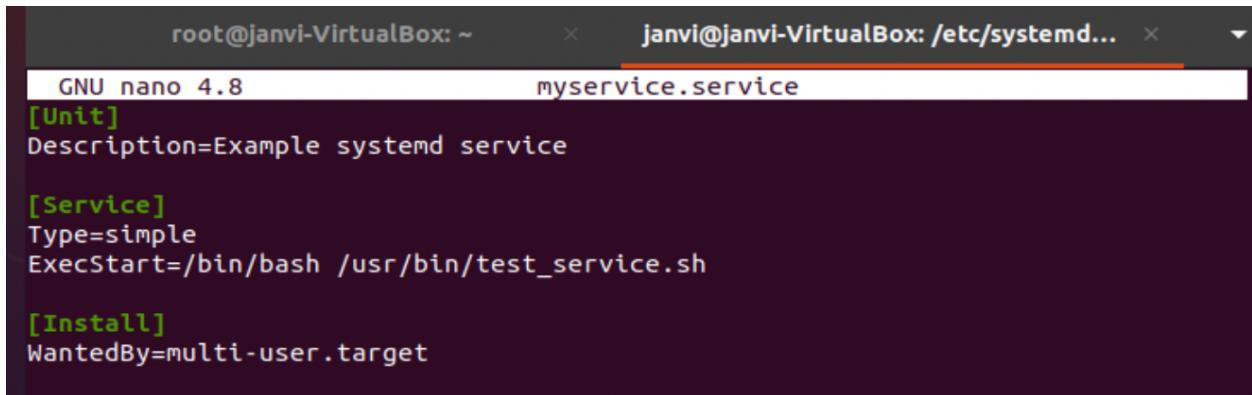
test_service.sh file



```
GNU nano 4.8          test_service.sh
DATE =`date '+%Y-%m-%d %H:%M:%S'`
echo "Example Service started at ${DATE}" | systemd-cat -p info

while:
do
echo "Looping...";
sleep 30;
done
```

myservice.service file



```
GNU nano 4.8          myservice.service
[Unit]
Description=Example systemd service

[Service]
Type=simple
ExecStart=/bin/bash /usr/bin/test_service.sh

[Install]
WantedBy=multi-user.target
```

Systemctl command to manage the service:

1. Reload the service files to include the new service.
sudo systemctl daemon-reload
2. Start your service
sudo systemctl start <your-service>.service
4. Check the status of your service
sudo systemctl status <your-service>.service
5. Enable the service on every reboot
sudo systemctl enable <your-service>.service
6. Disable your service on every reboot
sudo systemctl disable <your-service>.service

```
janvi@janvi-VirtualBox:~$ sudo systemctl start myservice
janvi@janvi-VirtualBox:~$ sudo systemctl status myservice
● myservice.service - Example systemd service
  Loaded: loaded (/etc/systemd/system/myservice.service; disabled; vendor pr>
  Active: active (running) since Thu 2022-02-17 01:29:17 IST; 7s ago
    Main PID: 6295 (bash)
       Tasks: 2 (limit: 1087)
      Memory: 544.0K
         CGrou: /system.slice/myservice.service
                   └─6295 /bin/bash /usr/bin/test_service.sh
                     ├ 6300 sleep 30

Feb 17 01:29:17 janvi-VirtualBox systemd[1]: Started Example systemd service.
Feb 17 01:29:17 janvi-VirtualBox bash[6297]: /usr/bin/test_service.sh: line 1:>
Feb 17 01:29:17 janvi-VirtualBox cat[6299]: Example Service started at
Feb 17 01:29:17 janvi-VirtualBox bash[6295]: Looping...
lines 1-14/14 (END)
^C
janvi@janvi-VirtualBox:~$ sudo systemctl enable myservice
```

```
janvi@janvi-VirtualBox:~$ sudo systemctl enable myservice
Created symlink /etc/systemd/system/multi-user.target.wants/myservice.service →
 /etc/systemd/system/myservice.service.
janvi@janvi-VirtualBox:~$ sudo systemctl status myservice
● myservice.service - Example systemd service
  Loaded: loaded (/etc/systemd/system/myservice.service; enabled; vendor pr>
  Active: active (running) since Thu 2022-02-17 01:29:17 IST; 1min 58s ago
    Main PID: 6295 (bash)
       Tasks: 2 (limit: 1087)
      Memory: 552.0K
         CGrou: /system.slice/myservice.service
                   └─6295 /bin/bash /usr/bin/test_service.sh
                     ├ 6337 sleep 30

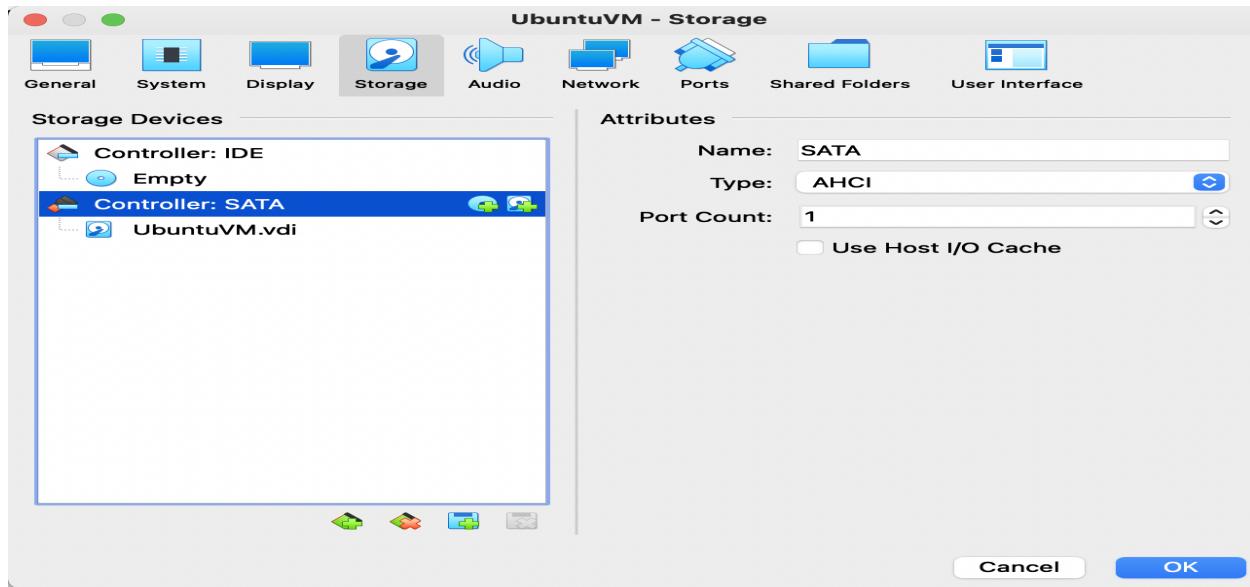
Feb 17 01:29:17 janvi-VirtualBox systemd[1]: Started Example systemd service.
Feb 17 01:29:17 janvi-VirtualBox bash[6297]: /usr/bin/test_service.sh: line 1:>
Feb 17 01:29:17 janvi-VirtualBox cat[6299]: Example Service started at
Feb 17 01:29:17 janvi-VirtualBox bash[6295]: Looping...
Feb 17 01:29:47 janvi-VirtualBox bash[6295]: Looping...
Feb 17 01:30:17 janvi-VirtualBox bash[6295]: Looping...
Feb 17 01:30:47 janvi-VirtualBox bash[6295]: Looping...
lines 1-17/17 (END)
```

```
janvi@janvi-VirtualBox:~$ sudo systemctl stop myservice
janvi@janvi-VirtualBox:~$ sudo systemctl restart myservice
```

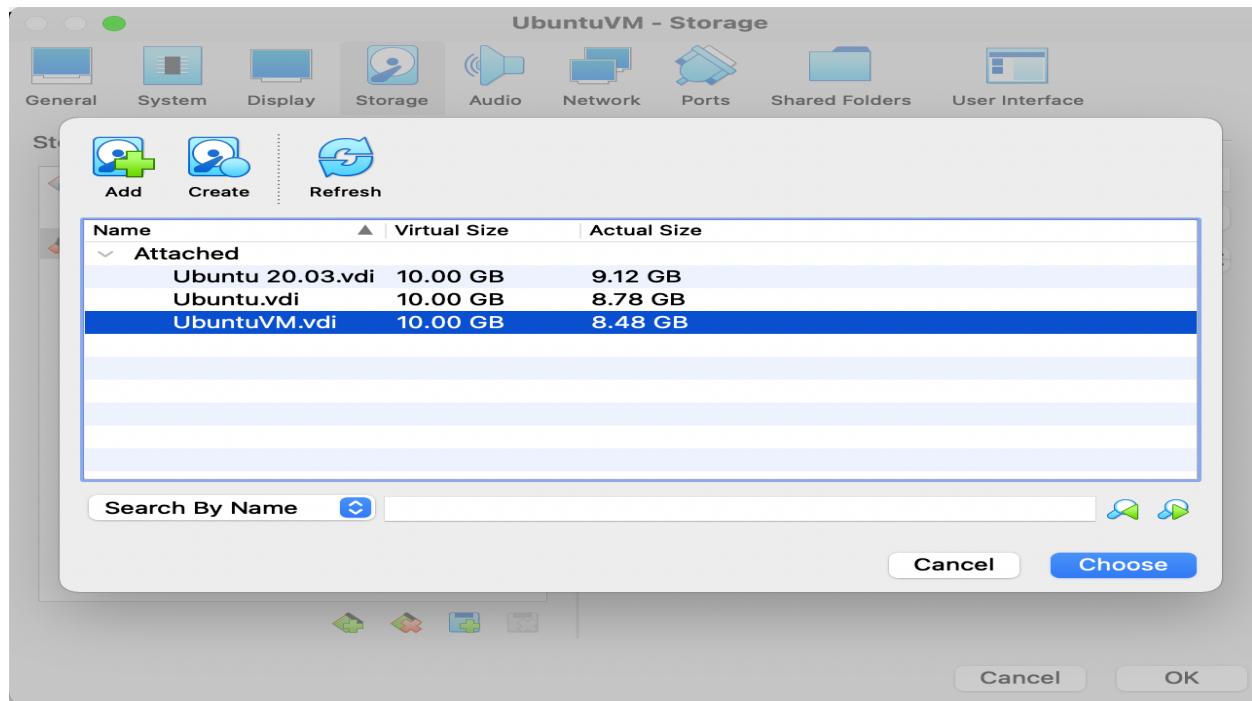
Task 5

1. Try attaching a disk to the VM ?

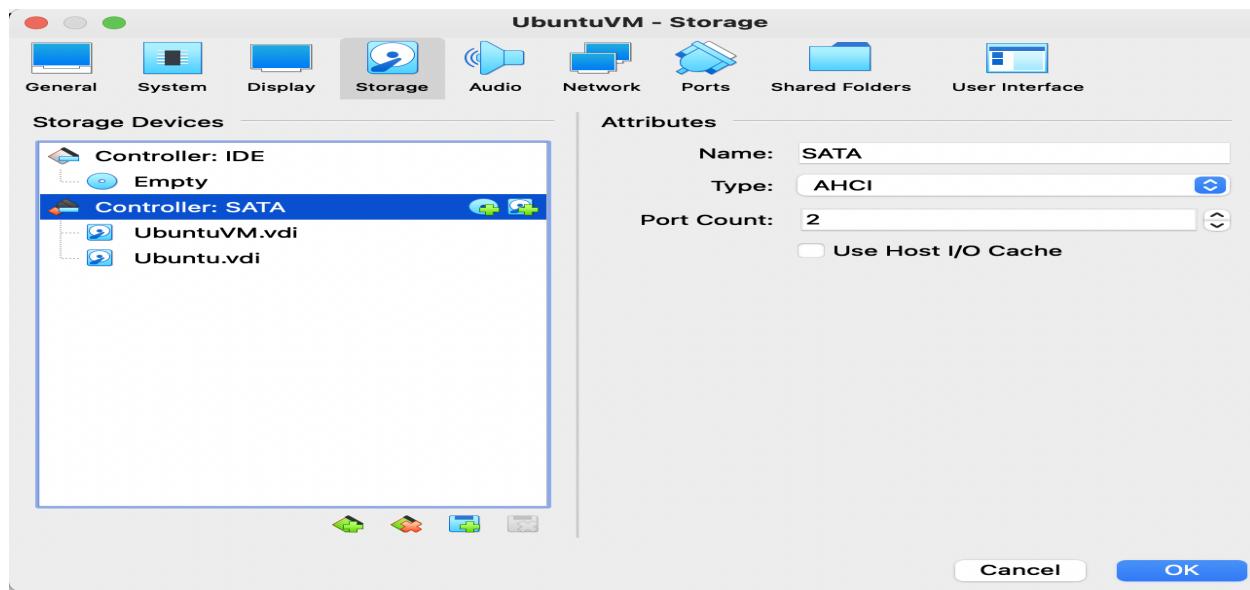
1. For attaching a disk to the VM. Go to the settings of ubuntu machine and go to storage.



2. Add a hard disk in Controller:SATA and click create.



3. The addition hard disk is now attached to the virtual machine.



2. Format (with any file system of ur choice) and mount the disk on /testmount.?

Step 1: Check all the disks that are present in the system .Use - sudo fdisk -l

```
janvi@janvi-VirtualBox:~$ sudo fdisk -l
[sudo] password for janvi:

Disk /dev/sda: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xd4ce60e1

Device      Boot   Start     End   Sectors  Size Id Type
/dev/sda1    *      2048 1050623  1048576  512M  b W95 FAT32
/dev/sda2          1052670 20969471 19916802  9.5G  5 Extended
/dev/sda5          1052672 20969471 19916800  9.5G 83 Linux

Disk /dev/sdb: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x2f5b36a0

Device      Boot   Start     End   Sectors  Size Id Type
/dev/sdb1    *      2048 1050623  1048576  512M  b W95 FAT32
/dev/sdb2          1050624 2101247 1050624  513M  b W95 FAT32
/dev/sdb3          2103294 20969471 18866178     9G  5 Extended
/dev/sdb5          2103296 20969471 18866176     9G 83 Linux
```

Step 2: Choose any disk you wish to format. I am choosing /dev/sdb.

Step 3: Check where these harddisk are mounted on. Use - sudo lsblk

```
janvi@janvi-VirtualBox:~$ sudo lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0    7:0    0 55.4M  1 loop /snap/core18/2128
loop1    7:1    0 219M  1 loop /snap/gnome-3-34-1804/72
loop2    7:2    0 32.3M  1 loop /snap/snapd/12704
loop3    7:3    0 65.1M  1 loop /snap/gtk-common-themes/1515
loop4    7:4    0  51M  1 loop /snap/snap-store/547
loop5    7:5    0 55.5M  1 loop /snap/core18/2284
loop6    7:6    0 43.6M  1 loop /snap/snapd/14978
loop7    7:7    0   4K  1 loop /snap/bare/5
loop8    7:8    0 61.9M  1 loop /snap/core20/1328
loop9    7:9    0 219M  1 loop /snap/gnome-3-34-1804/77
loop10   7:10   0 65.2M  1 loop /snap/gtk-common-themes/1519
sda     8:0    0 10G  0 disk
└─sda1   8:1    0 512M 0 part /boot/efi
└─sda2   8:2    0   1K 0 part
└─sda5   8:5    0 9.5G 0 part /
sdb     8:16   0 10G  0 disk
└─sdb1   8:17   0 512M 0 part
└─sdb2   8:18   0 513M 0 part
└─sdb3   8:19   0   1K 0 part
└─sdb5   8:21   0   9G 0 part
sr0    11:0   1 1024M 0 rom
```

Step 4: I have used ext4 file system to format our newly added hard disk . Use- sudo mkfs.ext4 /dev/sdb

```
janvi@janvi-VirtualBox:~$ sudo mkfs.ext4 /dev/sdb
mke2fs 1.45.5 (07-Jan-2020)
Found a dos partition table in /dev/sdb
Proceed anyway? (y,N) y
Creating filesystem with 2621440 4k blocks and 655360 inodes
Filesystem UUID: 9eb495c9-8ce4-4013-a629-51c2d4472a8e
Superblock backups stored on blocks:
            32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

```
janvi@janvi-VirtualBox:~$ sudo lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0    7:0     0 55.4M  1 loop /snap/core18/2128
loop1    7:1     0 219M  1 loop /snap/gnome-3-34-1804/72
loop2    7:2     0 32.3M  1 loop /snap/snapd/12704
loop3    7:3     0 65.1M  1 loop /snap/gtk-common-themes/1515
loop4    7:4     0  51M  1 loop /snap/snap-store/547
loop5    7:5     0 55.5M  1 loop /snap/core18/2284
loop6    7:6     0 43.6M  1 loop /snap/snapd/14978
loop7    7:7     0   4K  1 loop /snap/bare/5
loop8    7:8     0 61.9M  1 loop /snap/core20/1328
loop9    7:9     0 219M  1 loop /snap/gnome-3-34-1804/77
loop10   7:10    0 65.2M  1 loop /snap/gtk-common-themes/1519
loop11   7:11    0 54.2M  1 loop /snap/snap-store/558
sda      8:0     0 10G   0 disk
└─sda1   8:1     0 512M  0 part /boot/efi
└─sda2   8:2     0   1K  0 part
└─sda5   8:5     0 9.5G  0 part /
sdb      8:16    0 10G   0 disk
sr0     11:0    1 1024M 0 rom
```

Step 5: In order to mount this to a directory names testmount . make a directory.

Step 6: Mount our hard disk onto testmount using sudo mount /dev/sdb /testmount

Step 7: Our disk is mounted on testmount. Check using sudo lsblk

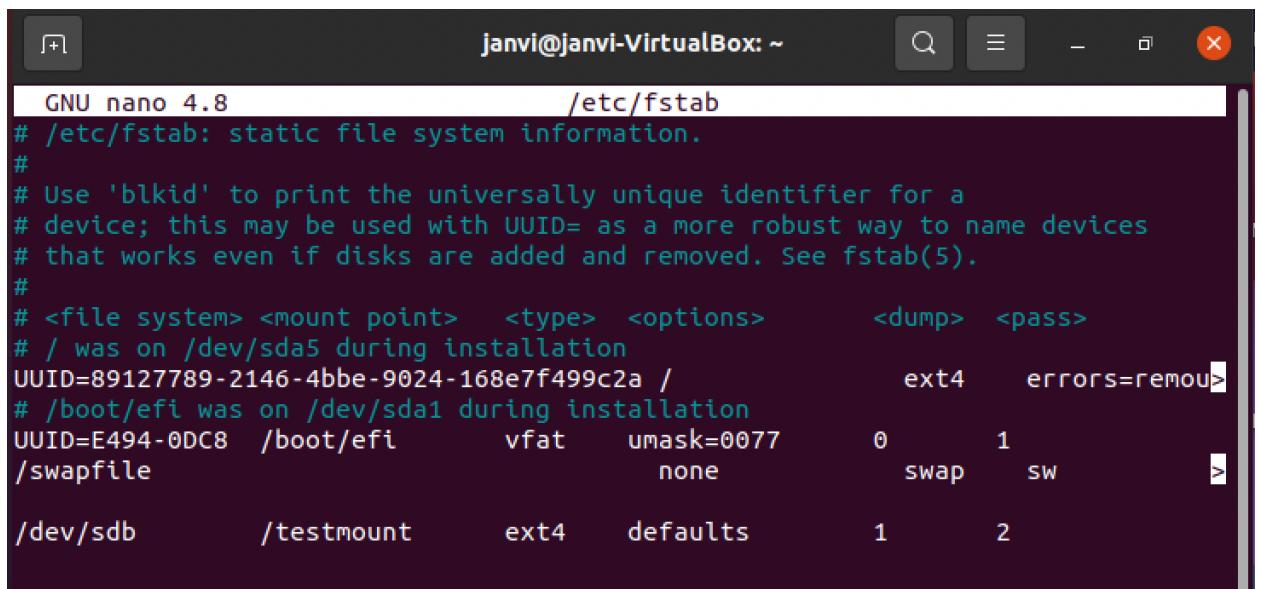
```
janvi@janvi-VirtualBox:~$ sudo mkdir /testmount
janvi@janvi-VirtualBox:~$ sudo fdisk -l /dev/sdb
Disk /dev/sdb: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
janvi@janvi-VirtualBox:~$ sudo mount /dev/sdb /testmount
janvi@janvi-VirtualBox:~$ sudo lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0    7:0     0 55.4M  1 loop /snap/core18/2128
loop1    7:1     0 219M  1 loop /snap/gnome-3-34-1804/72
loop3    7:3     0 65.1M  1 loop /snap/gtk-common-themes/1515
loop4    7:4     0  51M  1 loop /snap/snap-store/547
loop5    7:5     0 55.5M  1 loop /snap/core18/2284
loop6    7:6     0 43.6M  1 loop /snap/snapd/14978
loop7    7:7     0   4K  1 loop /snap/bare/5
loop8    7:8     0 61.9M  1 loop /snap/core20/1328
loop9    7:9     0 219M  1 loop /snap/gnome-3-34-1804/77
loop10   7:10    0 65.2M  1 loop /snap/gtk-common-themes/1519
loop11   7:11    0 54.2M  1 loop /snap/snap-store/558
loop12   7:12    0 248.8M 1 loop /snap/gnome-3-38-2004/99
sda      8:0     0 10G   0 disk
└─sda1   8:1     0 512M  0 part /boot/efi
└─sda2   8:2     0   1K  0 part
└─sda5   8:5     0 9.5G  0 part /
sdb      8:16    0 10G   0 disk /testmount
sr0     11:0    1 1024M 0 rom
janvi@janvi-VirtualBox:~$
```

3. Reboot the machine and ensure that the mount is persisted across reboots.?

Step 1 : To ensure that the mount is persisted across reboot , we need to make the mount permanent by making its entry in the fstab.

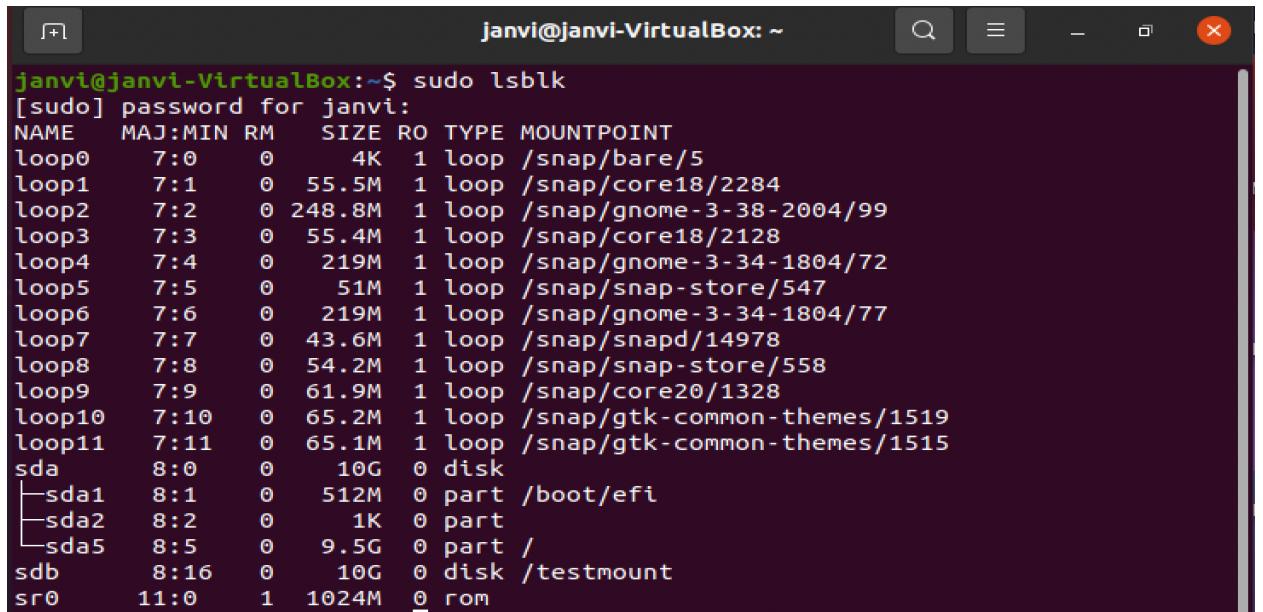
```
janvi@janvi-VirtualBox:~$ sudo nano /etc/fstab
```

Step 2: Manually add the filesystem , mountpoint , type , dump , and pass for /dev/sdb



```
janvi@janvi-VirtualBox: ~
GNU nano 4.8          /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options>      <dump> <pass>
# / was on /dev/sda5 during installation
UUID=89127789-2146-4bbe-9024-168e7f499c2a /           ext4   errors=remou>
# /boot/efi was on /dev/sda1 during installation
UUID=E494-0DC8 /boot/efi     vfat    umask=0077      0       1
/swapfile                           none            swap   sw      >
/dev/sdb      /testmount     ext4    defaults      1       2
```

Step 3: Reboot the machine now and check our mount using lsblk.



```
janvi@janvi-VirtualBox:~$ sudo lsblk
[sudo] password for janvi:
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0   7:0     0   4K  1 loop /snap/bare/5
loop1   7:1     0 55.5M 1 loop /snap/core18/2284
loop2   7:2     0 248.8M 1 loop /snap/gnome-3-38-2004/99
loop3   7:3     0 55.4M 1 loop /snap/core18/2128
loop4   7:4     0 219M 1 loop /snap/gnome-3-34-1804/72
loop5   7:5     0   51M 1 loop /snap/snap-store/547
loop6   7:6     0 219M 1 loop /snap/gnome-3-34-1804/77
loop7   7:7     0 43.6M 1 loop /snap/snapd/14978
loop8   7:8     0 54.2M 1 loop /snap/snap-store/558
loop9   7:9     0 61.9M 1 loop /snap/core20/1328
loop10  7:10    0 65.2M 1 loop /snap/gtk-common-themes/1519
loop11  7:11    0 65.1M 1 loop /snap/gtk-common-themes/1515
sda     8:0     0   10G  0 disk 
└─sda1  8:1     0   512M 0 part /boot/efi
└─sda2  8:2     0    1K  0 part
└─sda5  8:5     0   9.5G 0 part /
sdb     8:16    0   10G  0 disk /testmount
sr0    11:0    1 1024M 0 rom
```

4. Unmount the mount point and play around with Logical Volume Manager?

Step 1: Unmount the mount point using sudo umount command. You can see below that the hard disk mount point is disappeared.

```
janvi@janvi-VirtualBox:~$ sudo umount /dev/sdb
janvi@janvi-VirtualBox:~$ sudo lsblk
NAME   MAJ:MIN RM    SIZE RO TYPE MOUNTPOINT
loop0    7:0     0      4K  1 loop /snap/bare/5
loop1    7:1     0  55.5M  1 loop /snap/core18/2284
loop2    7:2     0 248.8M  1 loop /snap/gnome-3-38-2004/99
loop3    7:3     0  55.4M  1 loop /snap/core18/2128
loop4    7:4     0   219M  1 loop /snap/gnome-3-34-1804/72
loop5    7:5     0    51M  1 loop /snap/snap-store/547
loop6    7:6     0   219M  1 loop /snap/gnome-3-34-1804/77
loop7    7:7     0   43.6M  1 loop /snap/snapd/14978
loop8    7:8     0   54.2M  1 loop /snap/snap-store/558
loop9    7:9     0   61.9M  1 loop /snap/core20/1328
loop10   7:10    0   65.2M  1 loop /snap/gtk-common-themes/1519
loop11   7:11    0   65.1M  1 loop /snap/gtk-common-themes/1515
sda      8:0     0    10G  0 disk
└─sda1   8:1     0   512M  0 part /boot/efi
└─sda2   8:2     0    1K  0 part
└─sda5   8:5     0   9.5G  0 part /
sdb      8:16    0    10G  0 disk
└─sdb1   8:17    0 1024M  0 rom
s Show Applications 1 1024M 0 rom
janvi@janvi-VirtualBox:~$
```

Install LVM:

```
janvi@janvi-VirtualBox:~$ sudo apt install lvm2
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 libva-wayland2
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  dm-eventd libaio1 libdevmapper-event1.02.1 liblvm2cmd2.03 libreadline5
  thin-provisioning-tools
The following NEW packages will be installed:
  dm-eventd libaio1 libdevmapper-event1.02.1 liblvm2cmd2.03 libreadline5 lvm2
  thin-provisioning-tools
0 upgraded, 7 newly installed, 0 to remove and 218 not upgraded.
Need to get 0 B/255 kB of archives.
A Show Applications tion, 8,919 kB of additional disk space will be used.
```

5. Create PV, VG and LV.

Get into the root user for creating the PV.

```
janvi@janvi-VirtualBox:~$ sudo su root
```

Use the command to create the PV : pvcreate /dev/sdb to make the disk a physical volume.

Create a VG of the the name pg_group with the help of the command : vgcreate pb_group /dev/sdb

Use the command to create the LV within the VG: lvcreate -L 300M -n lv1 pb_group

```
root@janvi-VirtualBox:/home/janvi# pvcreate /dev/sdb
WADNTNC: ext4 signature detected on /dev/sdb at offset 1080. Wipe it? [y/n]: y
  LibreOffice Writer gnature on /dev/sdb.
Physical volume "/dev/sdb" successfully created.
root@janvi-VirtualBox:/home/janvi# vgcreate pb_group /dev/sdb
  Volume group "pb_group" successfully created
root@janvi-VirtualBox:/home/janvi# lvcreate -L 300M -n lv1 pb_group
Logical volume "lv1" created.
```

To display all three of them use command: pvdisplay , vgdisplay , lvdisplay

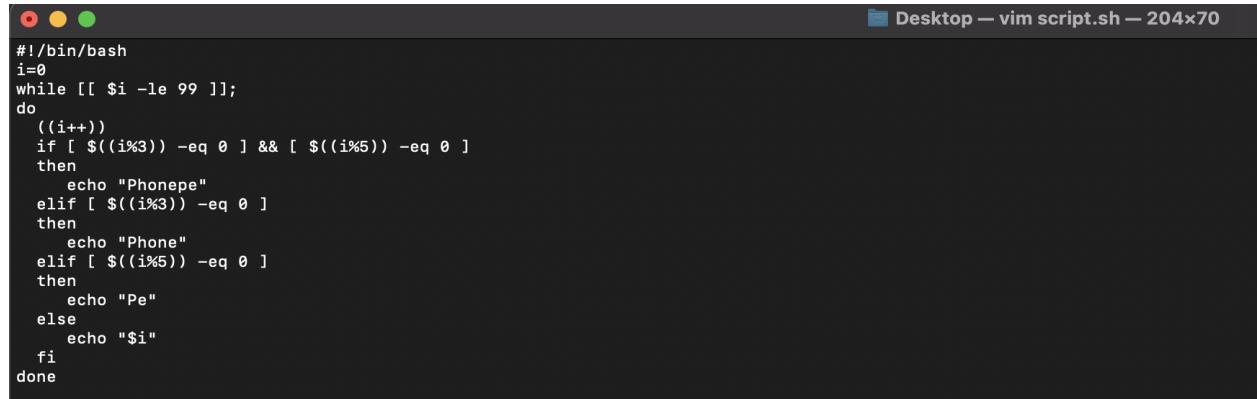
```
root@janvi-VirtualBox:/home/janvi# pvdisplay
--- Physical volume ---
PV Name           /dev/sdb
VG Name           pb_group
PV Size          10.00 GiB / not usable 4.00 MiB
Allocatable       yes
PE Size          4.00 MiB
Total PE         2559
Free PE          2484
Allocated PE     75
PV UUID          15LAwX-f7Ja-Xr3k-FpjR-cq4h-P8nX-VYLBWS

root@janvi-VirtualBox:/home/janvi# vgdisplay
--- Volume group ---
VG Name           pb_group
System ID         lvm2
Format            lvm2
Metadata Areas   1
Metadata Sequence No 2
VG Access        read/write
VG Status        resizable
MAX LV           0
Cur LV           1
Open LV           0
Max PV           0
Cur PV           1
  ...
Show Applications <10.00 GiB
PE Size          4.00 MiB
```

```
root@janvi-VirtualBox:/home/janvi# lvdisplay
--- Logical volume ---
LV Path           /dev/pb_group/lv1
LV Name           lv1
VG Name           pb_group
LV UUID           xnIg7Q-n1zh-Yd7e-2U04-PSia-SISH-pENFTd
LV Write Access   read/write
LV Creation host, time janvi-VirtualBox, 2022-02-17 11:32:46 +0530
LV Status         available
# open            0
LV Size           300.00 MiB
Current LE        75
Segments          1
Allocation        inherit
Read ahead sectors auto
- currently set to 256
Block device      253:0
```

Task 6

1. Write a bash script to print the numbers from 1 to 100, but print **PHONE** if the number is divisible by 3 and print **PE** if the number is divisible by 5.



The screenshot shows a terminal window titled "Desktop — vim script.sh — 204x70". The script content is as follows:

```
#!/bin/bash
i=0
while [[ $i -le 99 ]]; do
    ((i++))
    if [=$((i%3)) -eq 0 ] && [=$((i%5)) -eq 0 ]
    then
        echo "Phonepe"
    elif [=$((i%3)) -eq 0 ]
    then
        echo "Phone"
    elif [=$((i%5)) -eq 0 ]
    then
        echo "Pe"
    else
        echo "$i"
    fi
done
```

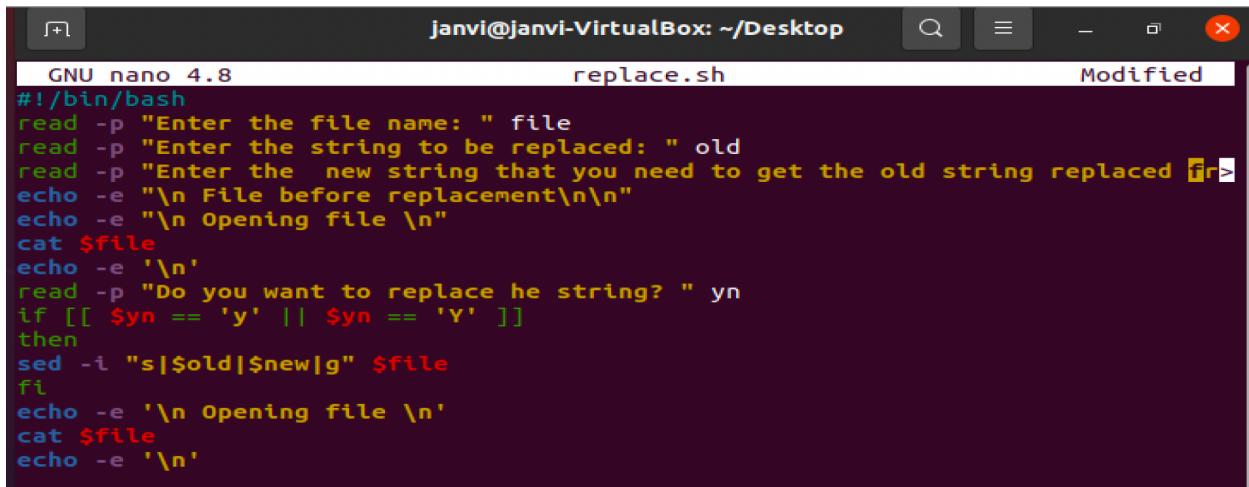
Output:

```
PP-C02FX1QZMD6M:Desktop janvi.intern$ vim script.sh
PP-C02FX1QZMD6M:Desktop janvi.intern$ sh script.sh
1
2
Phone
4
Pe
Phone
7
8
Phone
Pe
11
Phone
13
14
Phonepe
16
17
Phone
19
Pe
Phone
22
23
Phone
Pe
26
Phone
28
29
Phonepe
31
32
Phone
34
Pe
Phone
37
38
Phone
Pe
41
Phone
43
44
Phonepe
46
47
Phone
49
Pe
Phone
52
53
Phone
Pe
56
Phone
58
59
Phonepe
61
62
Phone
64
Pe
Phone
67
68

Phone
Pe
71
Phone
73
74
Phonepe
76
77
Phone
79
Pe
Phone
82
83
Phone
Pe
86
Phone
88
89
Phonepe
91
92
Phone
94
Pe
Phone
97
98
Phone
Pe
PP-C02FX1QZMD6M:Desktop janvi.intern$ 
PP-C02FX1QZMD6M:Desktop janvi.intern$
```

2. Write a bash script to find and replace a string in a file.X

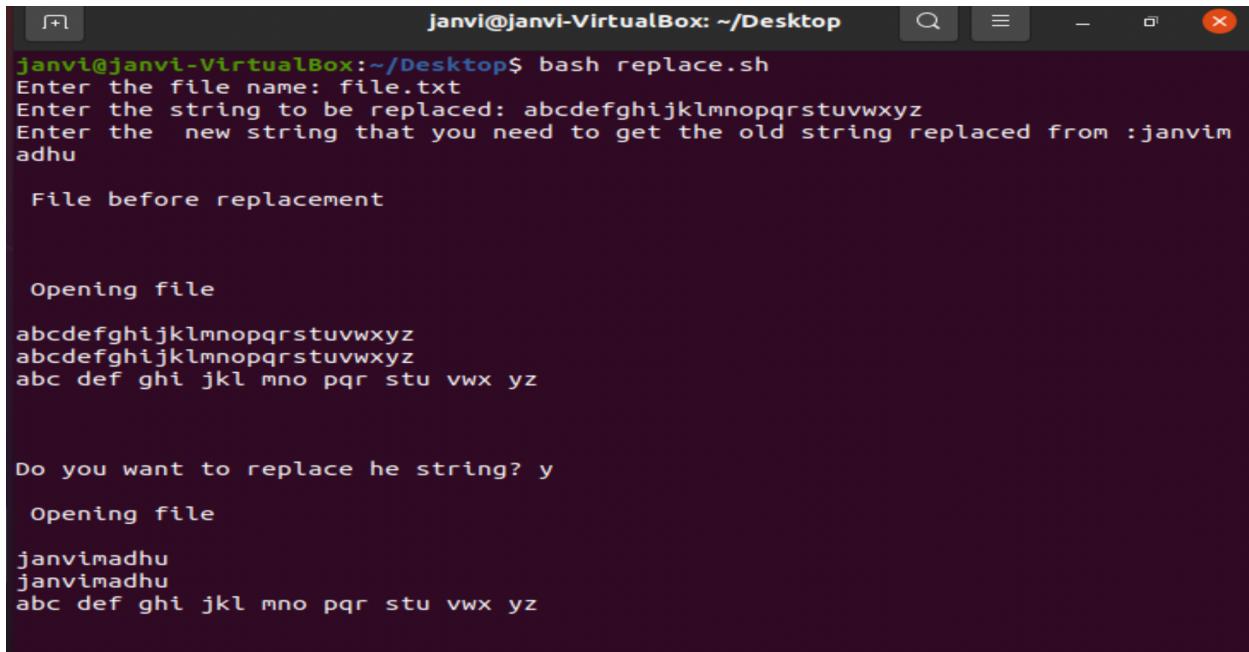
Bash Script:



```
GNU nano 4.8          replace.sh          Modified
#!/bin/bash
read -p "Enter the file name: " file
read -p "Enter the string to be replaced: " old
read -p "Enter the new string that you need to get the old string replaced from : " new
echo -e "\n File before replacement\n\n"
echo -e "\n Opening file \n"
cat $file
echo -e '\n'
read -p "Do you want to replace the string? " yn
if [[ $yn == 'y' || $yn == 'Y' ]]
then
sed -i "s|$old|$new|g" $file
fi
echo -e '\n Opening file \n'
cat $file
echo -e '\n'
```

In the third read line its read -p “Enter the new string that you need to get the old string replaced from : ” new

Output:



```
janvi@janvi-VirtualBox:~/Desktop$ bash replace.sh
Enter the file name: file.txt
Enter the string to be replaced: abcdefghijklmnopqrstuvwxyz
Enter the new string that you need to get the old string replaced from :janvimadhu

File before replacement

Opening file

abcdefghijklmnopqrstuvwxyz
abcdefghijklmnopqrstuvwxyz
abc def ghi jkl mno pqr stu vwx yz


Do you want to replace the string? y

Opening file

janvimadhu
janvimadhu
abc def ghi jkl mno pqr stu vwx yz
```

For mac we can use the sed command :

```
sed -i '.bak' 's/find/replace/' /file.txt
```

```
sed -i 's/abc/XYZ/g' /file.txt
```

By using this command we are able to change all the occurrences of abc with XYZ as specified in the command.

```
XYZ def ghi jkl mno pqr stu vwx yz
XYZ def XYZ def ghi jkl mno XYZ pqr stu vwx yz XYZ
~
~
```

3. Write a bash script to check if a file exists or not, if it does not exist then create the file. (this file creation must happen via function). Otherwise print that file exists. Similarly create a logic if a directory exists or not.

This script will check whether the file exists or not and print accordingly that file exists or file does not exist.

Create the script file using sudo nano name.sh.

Run the sh using bash name.sh or sh name.sh

```
GNU nano 4.8                      file check script.sh          Modified
read -p "Enter the name of the file that needs to get checked": file

if [ -f "$file" ];
then
echo "$file exists."
else
echo "$file does not exist."
fi
```

```
janvi@janvi-VirtualBox:~/Desktop$ sh file_check_script.sh
Enter the name of the file that needs to get checked:file.txt
file.txt exists.
janvi@janvi-VirtualBox:~/Desktop$ sh file_check_script.sh
Enter the name of the file that needs to get checked:file_check.txt
file_check.txt does not exist.
janvi@janvi-VirtualBox:~/Desktop$
```

This script will check whether the directory exists or not and print accordingly that directory exists or directory does not exist.

Create the script file using sudo nano name.sh

Run the sh using bash name.sh or sh name.sh

```
GNU nano 4.8          direc_check_script.sh
read -p "Enter the name of the directory needs to be checked: " directory

if [ -d "$directory" ];
then
echo "$directory exist."
else
echo "$directory does not exist."
fi
```

```
janvi@janvi-VirtualBox:~/Desktop$ sh direc_check_script.sh
Enter the name of the directory needs to be checked: Desktop
Desktop does not exist.
janvi@janvi-VirtualBox:~/Desktop$ sh direc_check_script.sh
Enter the name of the directory needs to be checked: hello
hello exist.
janvi@janvi-VirtualBox:~/Desktop$
```

We know how we can check whether the file exists or not. Now we have to create that file with the help of a function if that file does not exist.

```
GNU nano 4.8                      file_check_script.sh
#!/bin/bash

write_file()
{
read -p "Enter the file name: "  file
if [ -f "$file" ];
then
echo "file exists."
else
echo "file does not exist. We have created the file for you."
touch "$file"
fi
while true;do
r Help p "Enter the content you want to add in the file. (write :q to get back to the terminal)";$input" = ":q" ];
then
return
echo "Input has been added."
fi
echo "$input" >> "$file"
cat $file
done
}

[ Read 29 lines ]
```

```
janvi@janvi-VirtualBox:~/Desktop$ sudo nano file_check_script.sh
janvi@janvi-VirtualBox:~/Desktop$ sh file_check_script.sh
Enter the file name: filecreate
file does not exist. We have created the file for you.
Enter the content you want to add in the file. (write :q to get back to the terminal)hello
hello
Enter the content you want to add in the file. (write :q to get back to the terminal)hyy
hello
hyy
```

Similarly , we can create a directory with the help of a bash script also.

```
GNU nano 4.8          direc_check_script.sh
#!/bin/bash

write_directory()
{
read -p "Enter the directory name: " directory
if [ -f "$directory" ];
then
echo "Directory exists."
else
echo "Directory does not exist. We have created that directory for you. "
mkdir "$directory"
echo "$directory has been created."
fi
}
write_directory
```

```
janvi@janvi-VirtualBox:~/Desktop$ sudo nano direc_check_script.sh
janvi@janvi-VirtualBox:~/Desktop$ sh direc_check_script.sh
Enter the directory name: directory_check
Directory does not exist. We have created that directory for you.
directory_check has been created.
janvi@janvi-VirtualBox:~/Desktop$
```

4. Write a bash script to demonstrate the case statement.

```
GNU nano 4.8          case.sh
echo "Which Operating System are you using ?"
echo "Windows , Android , Chrome, Linux , MacOS , others?"
read -p "Type your OS name ": Os

case $Os in
Windows | windows)
echo "Oh ! you use Windows. Great!"
;;
Android|android)
echo "Great ! Android has a lot of Applications."
;;
Chrome|chrome)
echo "Cool!!! Chrome . Amazing Choice."
;;
Linux|linux)
echo "All about Security! Great! Linux.."
;;
*)
echo "I'll Try that."
;;
esac
```

```
janvi@janvi-VirtualBox:~/Desktop$ sudo nano case.sh
janvi@janvi-VirtualBox:~/Desktop$ sh case.sh
Which Operating System are you using ?
Windows , Android , Chrome, Linux , MacOS , others?
Type your OS name :linux
All about Securtiy! Great! Linux..
janvi@janvi-VirtualBox:~/Desktop$ █
```

Created By - Janvi