

Step 1



Please select a virtual optical disk file or a physical optical drive containing a disk to start your new virtual machine from.

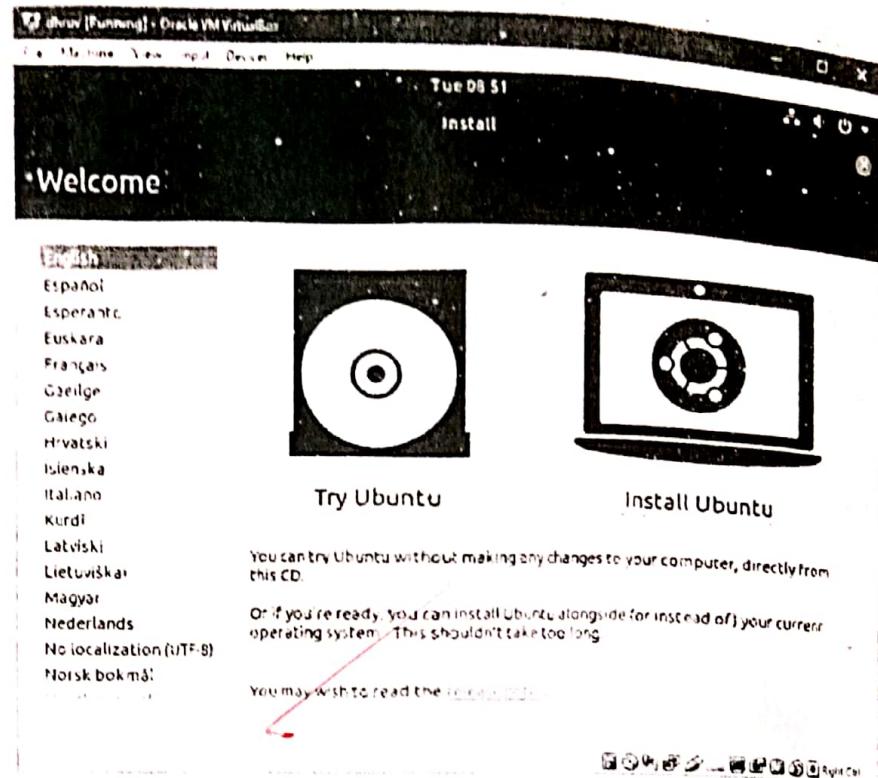
The disk should be suitable for starting a computer from and should contain the operating system you wish to install on the virtual machine if you want to do that now. The disk will be ejected from the virtual drive automatically next time you switch the virtual machine off, but you can also do this yourself if needed using the Devices menu.

Ubuntu-18.10-desktop-amd64.iso (1.86 GB)

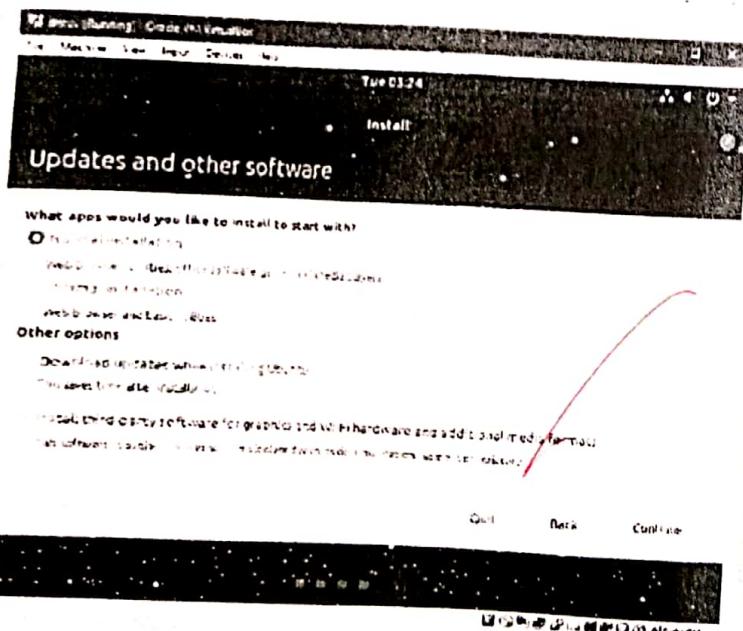
Star

Cancer

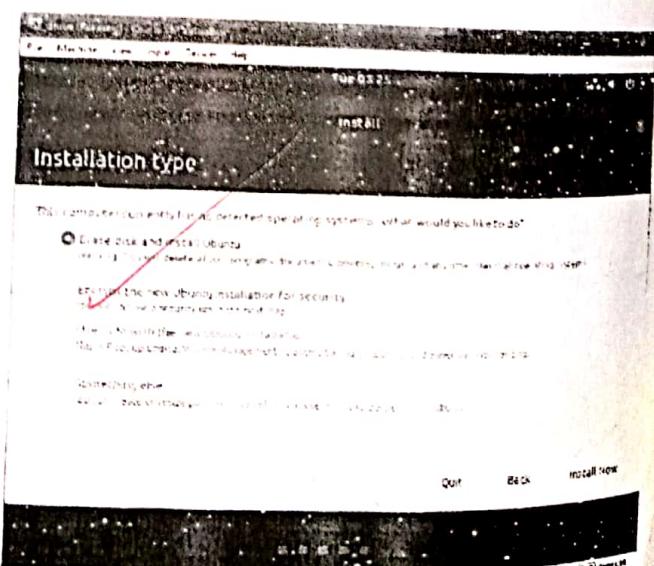
Step 2



Step3



step 4



PRACTICAL-01

Aim:- Install your choice of linux distribution

Eg:- Ubuntu, Fedora, Debian.

Ubuntu:- Ubuntu is a free and open source software based on debian. Ubuntu is officially released under 3 editions:- Desktop, server, union.

All the editions can be runned on the computer alone or a virtual machine. It is a popular open source software for cloud computer with support of openstack.

Steps for installing Ubuntu in virtual machine:-

Step1:- Select a virtual optical file on a physical drive to start ubuntu in your virtual machine. Space given to it is 1.86 GB.

Step2:- Select the language of your choice and click on 'install ubuntu'.

Step3:- In 'Updates and add software' click on 'the normal installation'.

Step4:- While configuration initialization type we need to click 'Erase disk and Install Ubuntu'. This step would delete all types of documents, photos, etc in all operation systems.

Step5:- In this type you need to choose the location for the clock to work on ubuntu.

Step 6:- In this step you need to choose username and password for the login in ubuntu and then click on continue.

Step 7:- Here you simply need to type password again and it is done.

Step 8:- Type name of virtual disk and recommended size to be given is 2048 GB or 2TB.

Therefore, now the virtualbox is ready to use.

- b) Customize desktop environment by changing different default options like changing default background, themes, screensavers.

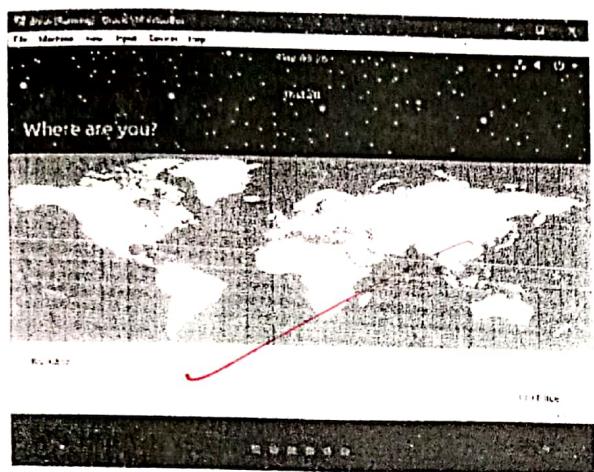
Accessing Appearance Settings:-

- 1) To access appearance settings in Ubuntu, let's click on username at the top right corner. On the top menu bar and select system settings.
2) A window will pop-up with all settings divided into personal, hardware and system options icons. Let's first select the appearance icon.

Changing wallpaper picture :-

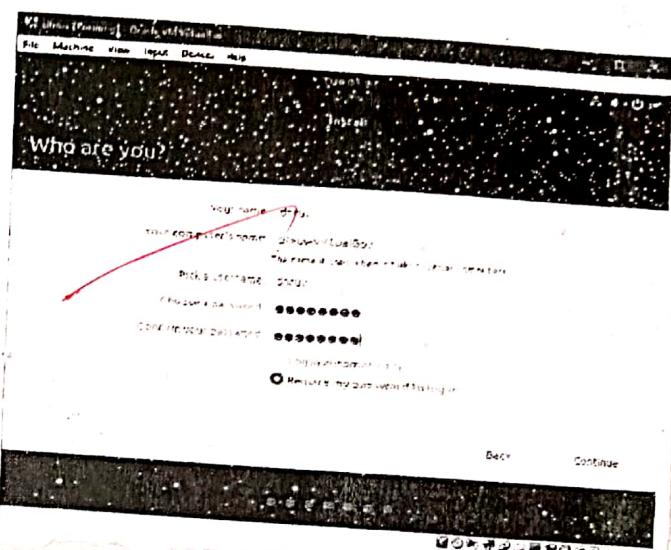
- 1) On the leftside of background part, you can see your current wallpaper.

Step5



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step6

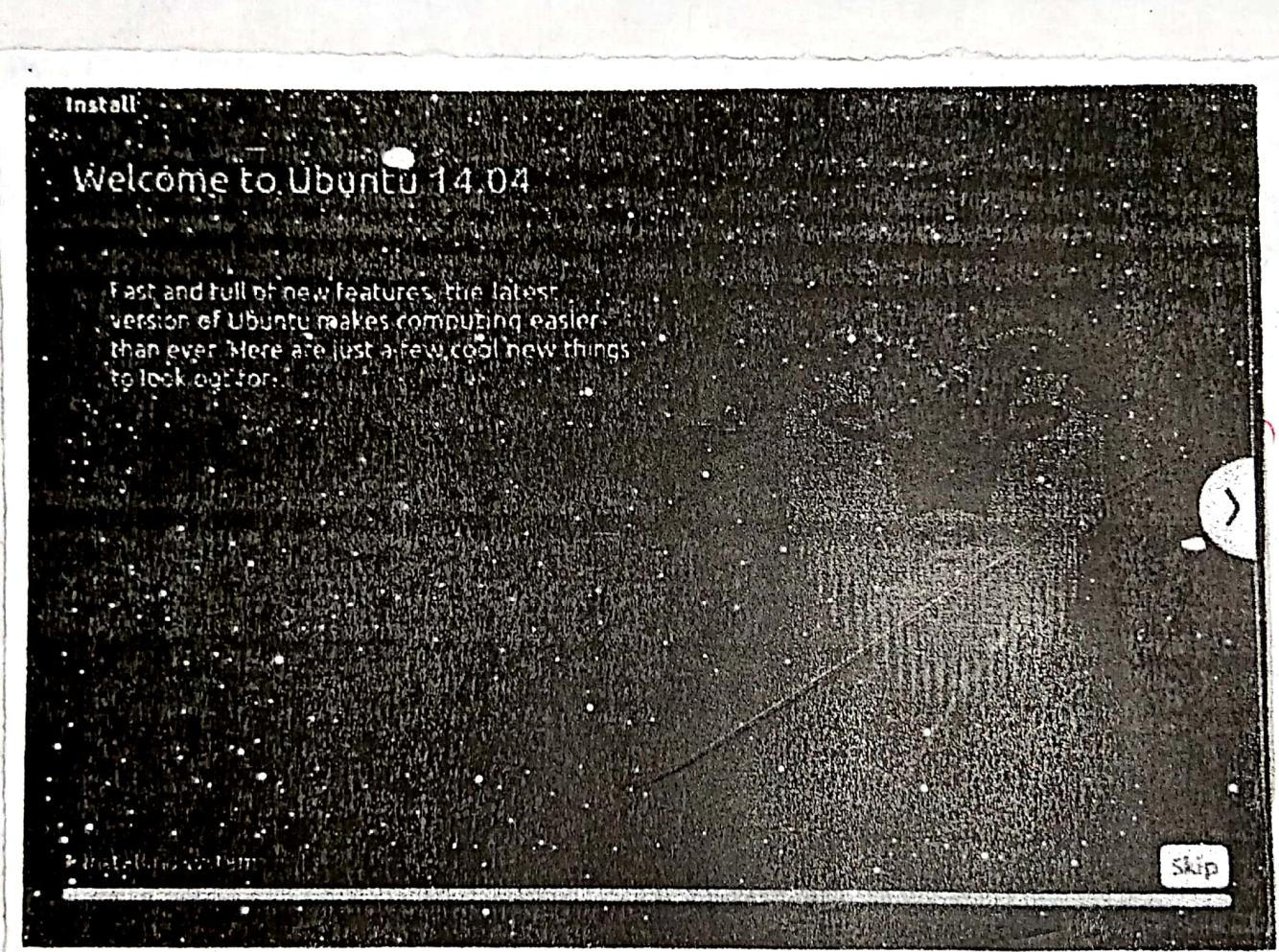


Step7



step 8





- 2) On the right side is part where we can select one of Ubuntu wallpapers. Click on any thumbnail our wallpaper will be changed right away.
- 3) If you want to select wallpaper from your picture folder. Click the dropdown menu above thumbnails and select the pictures folder.
- 4) You will see all the pictures in your pictures folder as thumbnails, where you can select them as your wallpaper.

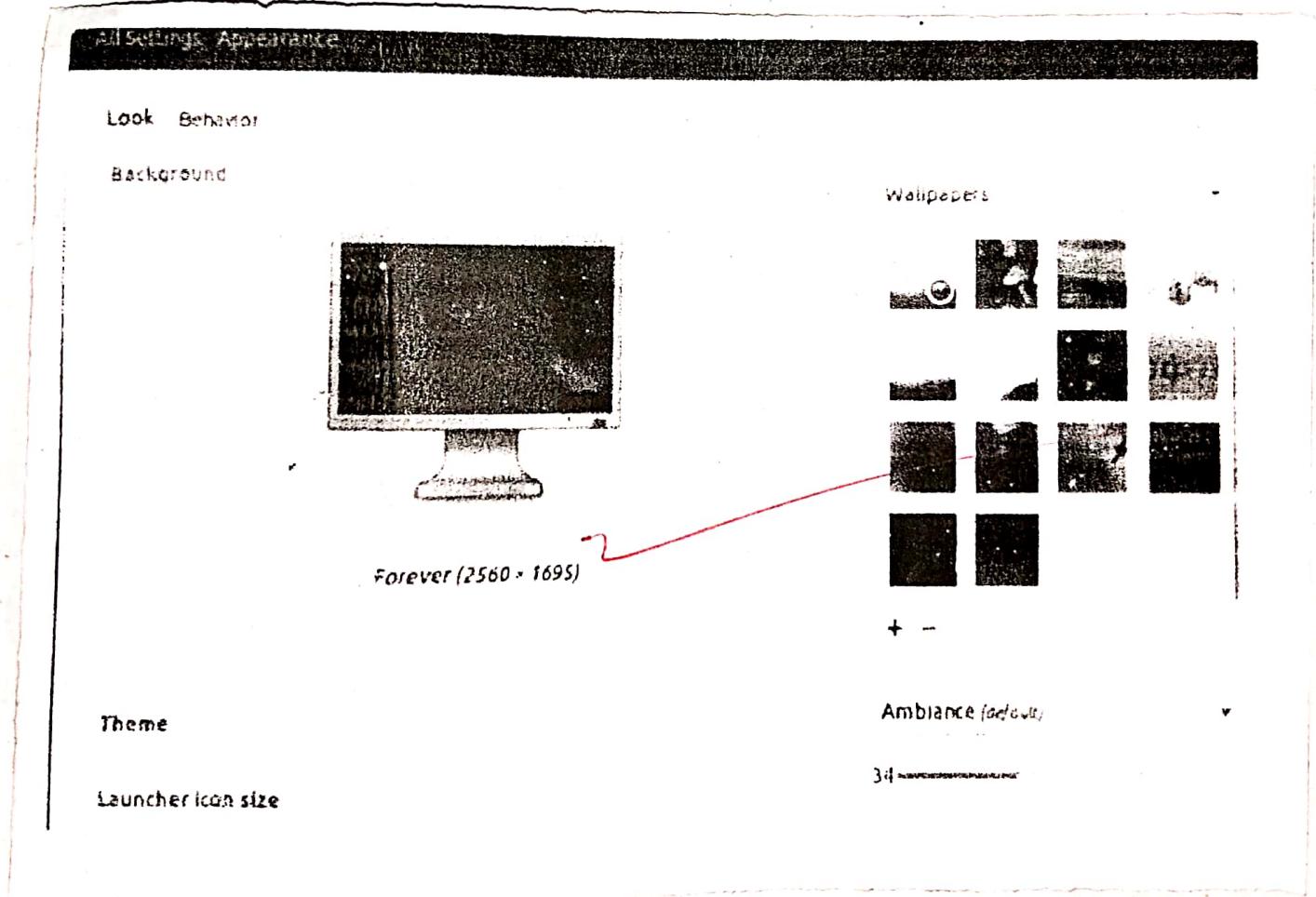
To add wallpaper that is in another folder, just click the plus icon below the thumbnails and then in pop-up window, select the path to our custom folder and choose the picture inside of it.

Changing Ubuntu Theme:

- 1) Ubuntu also has an option to change the Desktop theme, which in one click will change the entire way your computer looks.
- 2) To do that, click on the drop-down menu below the wallpaper, ~~thumbnails~~, and choose between Ambiance, Radiance or High contrast.
- 3) Ambiance is a light theme that looks a bit same while Radiance ~~or~~ High contrast is darker brown than

PSO

- c) Screen Resolution: Assertion the current screen resolution for your desktop.
- d) Changes the size or rotation of the screen:
 - 1) You can change how big things appear on the screen by changing the screen resolution.
 - 2) You can change which way up things appear by changing the rotation.
 - 3) Click the icon on the very right of the menu bar and select system settings.
 - 4) Open screen display.
 - 5) If you have multiple displays and they are not mirrored, you can have different settings on each display. Select a display in the preview area.
 - 6) Select your desired resolution and rotation.
 - 7) Click Apply. The new settings will be applied for 30 seconds before reverting back. That way, if you cannot see anything with the new.
- e) Time settings change the time zone of your system.
 - If you are currently in Indian time. How do



The displayed time change?

- 2) After noting the time change, change the time zone back to your local time zone.
- 3) Just click on the clock on the top bar, and choose time and date settings. Once the Time and Date window opens, choose your time zone from the map, and choose automatic.

87.

Aim:- Installing and removing software.

a) Install gcc package, verify that it runs and remove.

Step1:- First type 'gcc -v' to know if you have already installed gcc compiler or not. If the output is blank, it means that you don't have gcc installed.

Step2:- Type 'sudo apt-get install gcc'. After typing following command, installation will take place.

Step3:- Type 'sudo apt-get install build-essential'. It will install all the libraries required for c and c++.

b) NOW TO UNINSTALL GCC COMPILER:- In GCC's although there is no toplevel uninstall target, some directories do have it, in particular gcc, so you can

Type : cd build/gcc

~~sudo make uninstall~~

This does not ~~remove~~ everything that was installed but it removes major executables like gcc, g++, gpp contained in that directory.

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SEO

OUTPUT:-

NAME

tar - an auxiliary utility.

Synopsis

Traditional usage

tar { A | C | d | r | t | u | x } [G n s k U W Deepf]

UNIX-style usage

tar - A {OPTIONS} Archive Archive

tar - C { - f ARCHIVE } {OPTIONS} {FILE}

tar - d { - f ARCHIVE } {OPTIONS} {MEMBER}

tar - u { - f ARCHIVE } {OPTIONS} {FILE}

GNU style usage

tar { -- file | - concatenate {options} } Archive

tar { -- diff | - compare } { -- file ARCHIVE }

Aim:- Utilization of grep, man commands.

a) finding info documentation from the command line: bring up the info page for the grep command. Bring up the wage section.

Ans:- To find info about any command 'info' command is used. The syntax of 'info' command is "info command name".

We are going to find the info about the 'grep':

Open the terminal ($Ctrl + Alt + T$) and type: info grep
After typing this command following output will be displayed onto your screen:

You can also scroll through pages using (space=up) and (backspace=down) keys.

Another more summarized form of showing info is the 'man' command. The command is same as 'info', but required data

b) finding man pages from the cmd line: Bring up the man page for the 'ls' command. scroll down to example section.

Ans:- To use the 'man' command simple type 'man' (command name).

Now we are going to find the manual for 'tar' command simple type: 'man tar'.

c) finding man pages by topic what man pages are available, that document file compression.

Ans:- 'tar', 'zip' are some man pages which are

available for document file compression.

Simply type: man zip.

man tar

- d) Finding man pages by section from the cmd line
bring up the man page for the printf lib f.
which manual page section are library function found
Ans: the number corresponds to what section of the
manual page is form; 1 is user command, which is
sysadmin stuff. The man page for man itself explain
it and list the std.

There are certain terms that have different pages
in different sections. I as a 'stdlib' function appears
in section 3; in cases like that you can pass the
section no. before the page name to choose
which one you want or use man-a to show every
matching page in a row.

You can tell what section a term falls in with
'man-k'. It will do substring matches too. So you
need to use "term" to limit it.

- e) Command-line Help list the available options for the
mkdir command. How can you do this?
\$ mkdir -m a=rwx directoryname

Name

zip - package and compress (archive)

synopsis

`zip { -aTcd@EFGhijklmoprR }`

`{ - -longoption } { -b path }`

zipcloak

zipnote

zipslit

Description:-

zip is a compression and file packaging utility for Unix, VMS, MSDOS. It is analogous to a combination of the UNIX commands.

A companion program unpacks archives. The zip and unzip(1) programs can work with archives produced by PKZIP.

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= 0

command line Operations:-

a) Install new package on your system :-

sudo apt -get install [package name].

b) Remove the package installed :-

sudo apt -get remove [package name].

c) Find password file in/using find command.

find / -name passwd

- /usr/bin/passwd
- /usr/share/doc/passwd
- /etc/passwd
- /etc/pam.d/passwd

d) Find the directory file passwd :-

find / -maxdepth 2 -name passwd

- /etc/passwd

e) find the passwd file under root :-

find / -maxdepth 3 -name passwd

- /usr/bin/passwd
- /etc/pam.d/passwd
- /etc/passwd

f) Find password file between sub directories :-

find / -maxdepth 2 -maxdepth 3 -name passwd.

- /etc/pam.d/passwd
- /etc/passwd
- /usr/bin/passwd

- /etc/cron.daily/passwd

g) find passwd file between sub directories :-

```
#find | -maxdepth 3 - maxdepth 5 -name passwd
• /etc/pam.d/passwd
• /etc/passwd
• /etc/cron.daily/passwd
• /etc/bin/passwd
• /usr/bin/passwd
• /usr/share/bash-completion
• /usr/share/doc/passwd
• /usr/share/intian/overrides/passwd
```

h) Create a symbolic link to the file :-

```
# ln -s file1 file2
ln -s Dpk.txt Abc.txt
ls
```

i) find location of ls, ps, bash commands :-

```
#where is ls
```

ls: /bin/ls /usr/share/man/man1/ls.1.gz

```
#where is ps
```

ps: /bin/ps /usr/share/man/man1/ps.1.gz

```
#where is bash
```

bash: /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz

PRACTICAL-05

Aim:- file Operations

1. Explore mounted file systems on your computer.

→ df -k

```
jeba@jeba-VirtualBox:~$ df -k
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              494436       0   494436   0% /dev
tmpfs             102416   3676    98740   4% /run
/dev/sda1        7092728 3383372  3326024  51% /
tmpfs             512076    216   511860   1% /dev/shm
tmpfs              5120       4    5116   1% /run/lock
tmpfs             512076       0   512076   0% /sys/fs/cgroup
tmpfs             102416     48   102368   1% /run/user/1000
jeba@jeba-VirtualBox:~$
```

2. What are the different ways of exploring mounted file systems on Linux?

→ Mount

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=494436k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=102416k,mode=755)
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,size=5120k)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,mode=755)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_agent=/lib/systemd/systemd-cgroups-agent,name=systemd,nsroot=/)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot=/)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net_cls,net_prio,nsroot=/)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=/)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsroot=/)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,nsroot=/)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsroot=/)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot=/)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsroot=/)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsroot=/)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=0,minproto=5,maxproto=5,direct)
hugetlbfss on /dev/hugepages type hugetlbfss (rw,relatime)
```

3. Copying text files

→ cp command, mv command.

```
jeba@jeba-VirtualBox:~$ ls
Desktop Downloads desktop jj Music Pictures Public Templates Videos
Documents examples.desktop jj Pictures
jeba@jeba-VirtualBox:~$ cd jeb
jeba@jeba-VirtualBox:~/jeb$ cat .gg.txt
cat: .gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat >gg.txt
welcome
Linux
^C
jeba@jeba-VirtualBox:~/jeb$ touch dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt gg.txt
jeba@jeba-VirtualBox:~/jeb$ cp gg.txt dd.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ █
```

```
jeba@jeba-VirtualBox:~/jeb$ touch ss.txt  
jeba@jeba-VirtualBox:~/jeb$ mv gg.txt ss.txt  
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt  
cat: gg.txt: No such file or directory  
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt  
welcome  
Linux  
jeba@jeba-VirtualBox:~/jeb$ █
```

4. Archiving and backup the word directory using tar, gzip, bzip2.

→ gzip filename.txt

Bzip2 filename.tat

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY'♦[REDACTED]♦[REDACTED]
'J»w$S♦[REDACTED]1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
♦[REDACTED]d.txt+0♦I♦Meee♦+♦[REDACTED]♦Xzjeba@jeba-VirtualBox:~/jeb$
```

5) Use diff command to create diff of two files
→ diff filename1 filename2.

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```
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat >aa.txt
hello world
^C
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is linux^C
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
1d0
< hello world
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is Linux
^C
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
1c1
< hello world
---
> this is Linux
jeba@jeba-VirtualBox:~/jeb$ gzip aa.txt
jeba@jeba-VirtualBox:~/jeb$ gzip bb.txt
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt.gz bb.txt.gz
Binary files aa.txt.gz and bb.txt.gz differ
```

6) Use patch command to patch a file. And analyze the patch using patch command again.

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt
hi
hi
hi
^C
jeba@jeba-VirtualBox:~/jeb$ cat >hii.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hii.txt >sam.patch
^C
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch
patching file hi.txt
jeba@jeba-VirtualBox:~/jeb$ cat sam.patch
--- hi.txt      2020-01-08 22:14:55.463569834 +0530
+++ hii.txt     2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$
```

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01/02

PRACTICAL-6

Aim:- ~~880~~ Use Environment

- a) Which account you logged in?
→ who command & whoami.

```
jeba@jeba-VirtualBox:~$ who
jeba@jeba-VirtualBox:~$ who
jeba    tty7      2020-01-15 20:32 (:0)
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -l
LOGIN   tty1      2020-01-15 20:30          780 id=tty1
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ w
20:35:04 up 4 min, 1 user, load average: 0.70, 0.79, 0.38
USER   TTY     FROM           LOGIN@ IDLE   JCPU   PCPU WHAT
jeba   tty7   :0            20:32    4:28   8.19s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -s
20:35:14 up 4 min, 1 user, load average: 0.60, 0.77, 0.37
USER   TTY     FROM           IDLE WHAT
jeba   tty7   :0            4:38   /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba   tty7   :0            20:32    4:44   8.67s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -f
20:36:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37
USER   TTY     LOGIN@ IDLE   JCPU   PCPU WHAT
jeba   tty7   20:32    5:36   9.00s  0.33s /sbin/upstart --user
```

- b) Display /etc/shadow file using cat command and understand the importance of shadow file. How it's difficult than passwd file.

→ cat /etc/shadow

- Username , up to 8 characters .
- Password , 13 character encrypted .
- The number of days since the password was changed .
- The number of days before password may be changed .
- The number of days after which password must be changed .
- The number of days to warn user of an expiring password .
- The number of days after password expires that account is disabled .
- The number of days since January 1, 1970 that an account has been disabled .

- A reserved field for possible future use.

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] password for jeba:
root!:18240:0:99999:7:::
daemon:*:16911:0:99999:7:::
bin:*:16911:0:99999:7:::
sys:*:16911:0:99999:7:::
sync:*:16911:0:99999:7:::
games:*:16911:0:99999:7:::
man:*:16911:0:99999:7:::
lp:*:16911:0:99999:7:::
mail:*:16911:0:99999:7:::
news:*:16911:0:99999:7:::
```

Each field in a passwd entry is separated with
":" characters; as follows:-

- Username, up to 8 characters. case-sensitive, usually all lowercase.
- An "x" in the password field. Passwords are stored in the "/etc/shadow" file.
- Numeric user id. This is assigned by the "adduser" script. Unix uses this field, plus the following group field, to identify which files belong to the user.
- Numeric group id. Red Hat user group id's in a fairly unique manner for enhanced file security.
- full name of user.
- User's home directory. Usually /home/username.
- User's "shell account". Often set to "/bin/bash" to provide access to the bash shell.

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/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
```

c) Get your current working directory.
 ↳ pwd

```
jeba@jeba-VirtualBox:~$ pwd
/home/jeba
jeba@jeba-VirtualBox:~$ █
```

d) Explore different ways of getting command history, how to run previously executed command without typing it.

↳ history
 ! line number

```
jeba@jeba-VirtualBox:~$ history
1 who
2 whoami
3 who -l
4 clear
5 w
6 w -s
7 w -h
8 w -f
9 clear
10 cat /etc/shadow
11 sudo cat /etc/shadow
12 clear
13 sudo cat /etc/passwd
14 pwd
15 clear
16 history
jeba@jeba-VirtualBox:~$ !3
who -l
LOGIN      tty1          2020-01-15 20:30
jeba@jeba-VirtualBox:~$ █
```

l) Create alias to most commonly used commands. **040**

→ alias label = "command".

```
jeba@jeba-VirtualBox:~$ alias m="mkdir new"
jeba@jeba-VirtualBox:~$ m
jeba@jeba-VirtualBox:~$ ls
Desktop   Downloads      [redacted] Music  Pictures  Templates
Documents examples.desktop .jj    new       Public    Videos
jeba@jeba-VirtualBox:~$
```

SD
01/02

PRACTICAL-07

Aim :- Linux Editors - vi

a) Create, modify, search and navigate a file in editor :-

i) Creating a file.

→ To create a file, on the terminal type vi followed by filename.

ii) Modifying the file

→ To modify a file, on the vi editor, type 'o'.

iii) Search in a file:

→ To find a word press / forward by the word to search.

iv) Navigate:

Movement in four directions.

key	Action
k	Moves cursor up.
j	Moves cursor down.
h	Moves cursor left.
l	Moves cursor right.

• Word Navigation:

key	Action
b	Moves back to the beginning
e	Moves forward to the end.
w	Moves forward to the beginning
(Zero)	Moves to first character.
\$	Moves to the end.

• Scrolling:-

key	Action
ctrl + f	scroll forward.
ctrl + b	scroll backward
ctrl + d	scroll half page
ctrl + u	scroll half page back.

- b) Learn all essential commands like search / replace, highlight, show line numbers.
- i) Replace:
Syntax: :/g/word to be replaced/s//new word/gc

Syntax: :/g/word to be replaced/s//new word/gc

```
Jeba@Jeba-VirtualBox: ~
Hello
This is my Linux example
Welcome
Welldone
This is Vi Editor
Thank you
~
I
:q/mys//our/gc
```

```
jeba@jeba-VirtualBox: ~
```

Hello
This is my Linux example
Welcome
Welldone
This is Vi Editor
Thank you

```
jeba@jeba-VirtualBox: ~
```

Hello
This is our Linux example
Welcome
Welldone
This is Vi Editor
Thank you

ii) **Highlights** :- Use set hlsrch.

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```
jeba@jeba-VirtualBox: ~
Hello
This is our Linux example
Welcome
Welldone
This is Vi Editor
Thank you
:set hlsearch
```

iii) show the line number: Use ~~set nu~~

```
jeba@jeba-VirtualBox: ~
1 Hello
2 This is our Linux example
3 Welcome
4 Welldone
5 This is Vi Editor
6 Thank you
7
:set nu
```

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PRACTICAL-08

042

Aim :- Linux Security.

- a) Use of sudo to change user privileges to root.
→ Create an user named user1.

```
jeba@jeba-VirtualBox:~$ sudo useradd user1
[sudo] password for jeba:
jeba@jeba-VirtualBox:~$ sudo passwd user1
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
jeba@jeba-VirtualBox:~$
```

To get some user root privileges edit /etc/sudoers using visudo. Enter new line as highlighted below.

```
# Please consider adding local content in /etc/sudoers.d/ instead of
# directly modifying this file.
#
# See the man page for details on how to write a sudoers file.
#
Defaults        env_reset
Defaults        mail_badpass
Defaults        secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/
sbin:/bin"
#
# Host alias specification
#
# User alias specification
#
# Cmnd alias specification
#
# User privilege specification
root    ALL=(ALL:ALL) ALL
user1  ALL=(ALL:ALL) ALL
```

- b) Identify operations that require sudo privileges.

```
jeba@jeba-VirtualBox:~$ su user1
Password:
user1@jeba-VirtualBox:/home/jeba$ mkdir folder1
mkdir: cannot create directory 'folder1': Permission denied
user1@jeba-VirtualBox:/home/jeba$ sudo mkdir folder1
[sudo] password for user1:
user1 is not in the sudoers file. This incident will be reported.
```

c) Modify expiration data for new user using
password ageing

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ sudo chage -l user1  
Last password change : Jan 20, 2020  
Password expires : never  
Password inactive : never  
Account expires : never  
Minimum number of days between password change : 0  
Maximum number of days between password change : 99999  
Number of days of warning before password expires : 7
```

```
jeba@jeba-VirtualBox:~$ sudo chage user1  
Changing the aging information for user1  
Enter the new value, or press ENTER for the default  
Minimum Password Age [0]: 100  
Maximum Password Age [99999]: 200  
Last Password Change (YYYY-MM-DD) [2020-01-20]: 2020-01-21  
Password Expiration Warning [7]: 5  
Password Inactive [-1]:  
Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31  
jeba@jeba-VirtualBox:~$ sudo chage -l user1  
Last password change : Jan 21, 2020  
Password expires : Aug 08, 2020  
Password inactive : never  
Account expires : Jan 31, 2020  
Minimum number of days between password change : 100  
Maximum number of days between password change : 200  
Number of days of warning before password expires : 5
```

```
jeba@jeba-VirtualBox:~$ sudo chage -E 25/01/2020 -m 10 -M 90 -I 30 -W 30 user1  
jeba@jeba-VirtualBox:~$ sudo chage -l user1  
Last password change : Jan 21, 2020  
Password expires : Apr 20, 2020  
Password inactive : May 20, 2020  
Account expires : Jan 01, 2022  
Minimum number of days between password change : 10  
Maximum number of days between password change : 90  
Number of days of warning before password expires : 30
```

d) Delete newly added user:-

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ sudo userdel user1  
[sudo] password for jeba:  
jeba@jeba-VirtualBox:~$ su user1  
No passwd entry for user 'user1'  
jeba@jeba-VirtualBox:~$
```

PRACTICAL-9

Aim:- Network Management

a) Get IP address of your machine using ifconfig.

```
jeba@jeba-VirtualBox:~$ ifconfig
jeba@jeba-VirtualBox:~$ ifconfig
enp0s3 Link encap:Ethernet HWaddr 08:00:27:0e:6b:69
          inet addr: 10.0.2.15 Bcast: 10.0.2.255 Mask: 255.255.255.0
          inet6 addr: fe80::c0cd:53a0:d5a3:848e/64 Scope: Link
            UP BROADCAST RUNNING MULTICAST MTU: 1500 Metric: 1
            RX packets: 2 errors: 0 dropped: 0 overruns: 0 frame: 0
            TX packets: 73 errors: 0 dropped: 0 overruns: 0 carrier: 0
            collisions: 0 txqueuelen: 1000
            RX bytes: 1180 (1.1 KB) TX bytes: 8518 (8.5 KB)

lo Link encap: Local Loopback
      inet addr: 127.0.0.1 Mask: 255.0.0.0
      inet6 addr: ::1/128 Scope: Host
        UP LOOPBACK RUNNING MTU: 65536 Metric: 1
        RX packets: 53240 errors: 0 dropped: 0 overruns: 0 frame: 0
        TX packets: 53240 errors: 0 dropped: 0 overruns: 0 carrier: 0
        collisions: 0 txqueuelen: 1
        RX bytes: 4225072 (4.2 MB) TX bytes: 4225072 (4.2 MB)
```

b) Get hostname of your machine.

```
jeba@jeba-VirtualBox:~$ hostname
jeba-VirtualBox
jeba@jeba-VirtualBox:~$ █
```

c) Use ping to check the network connectivity.

.8.10

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=
97.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=
82.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=
84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=
87.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=
93.5 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=
86.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=
98.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=
90.9 ms
^Z
[1]+ Stopped                  ping www.google.com
jeba@jeba-VirtualBox:~$
```

d) Use of dig command.

```
jeba@jeba-VirtualBox:~$ dig www.google.com
;; <>> DiG 9.10.3-P4-Ubuntu <>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52068
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.google.com.
;; ANSWER SECTION:
www.google.com.      91      IN      A      172.217.166.100
;; Query time: 152 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Jan 20 22:40:06 IST 2020
;; MSG SIZE  rcvd: 59
jeba@jeba-VirtualBox:~$
```

e) Troubleshooting network using traceroute, route command.

```
jeba@jeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.190 ms  0.143 ms  0.151 ms
 2  * * *
 3  10.0.2.2 (10.0.2.2)  68.568 ms  68.486 ms  68.405 ms
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-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 enp0s3
10.0.2.0        *             255.255.255.0 U      100    0    0 enp0s3
link-local      *             255.255.0.0   U      1000   0    0 enp0s3
jeba@jeba-VirtualBox:~$
```

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f) Use of arp command.

```
jeba@jeba-VirtualBox:~$ arp
Address          HWtype  HWaddress          Flags Mask           Iface
10.0.2.2          ether   52:54:00:12:35:02 C            enp0s
```

g) Use of host command.

```
jeba@jeba-VirtualBox:~$ host -V
host 9.10.3-P4-Ubuntu
jeba@jeba-VirtualBox:~$
```

h) Use of netstat command and Nmap - cmd.

```
jeba@jeba-VirtualBox:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type      State          I-Node Path
unix  2      [ ]           DGRAM    LISTEN      42149  /run/user/1000/system
d/notify
unix  2      [ ]           DGRAM    LISTEN      9694   /run/systemd/journal/
syslog
unix  16     [ ]           DGRAM    LISTEN      9695   /run/systemd/journal/
dev-log
unix  7      [ ]           DGRAM    LISTEN      9784   /run/systemd/journal/
socket
unix  3      [ ]           DGRAM    LISTEN      9684   /run/systemd/notify
unix  3      [ ]           STREAM   CONNECTED   44042  @/tmp/dbus-CymTeI7AQG
unix  3      [ ]           STREAM   CONNECTED   43331  @/tmp/dbus-CymTeI7AQG
unix  3      [ ]           STREAM   CONNECTED   42988  @/tmp/dbus-CymTeI7AQG
unix  3      [ ]           STREAM   CONNECTED   42690  @/tmp/dbus-CMGGc6G7PS
unix  3      [ ]           STREAM   CONNECTED   13242  /run/systemd/journal/
stdout
unix  3      [ ]           STREAM   CONNECTED   43113  /run/systemd/journal/
stderr
unix  3      [ ]           STREAM   CONNECTED   43013  /run/systemd/journal/
unix  3      [ ]           STREAM   CONNECTED   42935  /run/systemd/journal/
```

H/L

```
jeba@jeba-VirtualBox:~$ nmap www.google.com
Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-20 22:51 IST
Nmap scan report for www.google.com (216.58.196.68)
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404:6800:4007:811::2004
rDNS record for 216.58.196.68: bom05s11-in-f4.1e100.net
Not shown: 998 filtered ports
PORT      STATE SERVICE
80/tcp    open  http
443/tcp   open  https

Nmap done: 1 IP address (1 host up) scanned in 20.32 seconds
jeba@jeba-VirtualBox:~$
```

PRACTICAL-10.

Aim:- SHELL SCRIPTING.

A) Basics of shell scripting:-

- a) To get a shell, you need to start a terminal.
- b) To see what shell you run : echo \$SHELL.
- c) In Linux, the dollar sign stands for shell variable.
- d) The echo command just returns whatever you type in.
- e) #!/bin/bash - It is called shebang. It is written at the top of a shell-script and it passes the instruction to the program /bin/bash.

```
tcsc@tcsc-VirtualBox:~$ echo $SHELL
/bin/bash
tcsc@tcsc-VirtualBox:~$
```

• vi filename.sh

#!/bin/bash
echo "This is Linux".

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```
tesc@tesc-VirtualBox ~
$ /bin/bash
echo "THIS IS LINUX!"
```

linux.sh [New File]

• chmod 777 filename.sh
• ./filename.sh

```
tsc@tsc-VirtualBox ~
tsc@tsc-VirtualBox:~$ vi linux.sh
tsc@tsc-VirtualBox:~$ chmod 777 linux.sh
tsc@tsc-VirtualBox:~$ ./linux.sh
THIS IS LINUX!
tsc@tsc-VirtualBox:~$
```

- b) Step to write and execute a shell script :-
shell script is just a simple text file with .sh extension, having executable permission.
- Open terminal.
 - Navigate to the place where you want to create script using cd command.
 - Touch filename.sh
 - Vi filename.sh, e) chmod 777 filename.sh
 - sh filename.sh or ./filename.sh

Q) Program to display your name:-

#!/bin/bash

echo "Enter your name:"

read name

echo "My name is: \$name".

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```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
echo "Enter your name:"
read name
echo "My name is: $name"

:wq
```

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox: ~$ vi ubuntu.sh
tcsc@tcsc-VirtualBox: ~$ chmod 777 ubuntu.sh
tcsc@tcsc-VirtualBox: ~$ ./ubuntu.sh ...
'Enter your name:
TANVI
My name is: TANVI
tcsc@tcsc-VirtualBox: ~'
```

Q) Program to find the sum of two variables:-

vi filename.sh

#!/bin/bash

a=100

b=25

sum=\$((a+b))

echo "Sum is: \$sum"

```
tcsc@tcsc-VirtualBox: ~
```

```
#!/bin/bash  
a=100  
b=25  
sum=$((a+b))  
echo "Sum is:$sum"
```

```
:wq
```

```
tcsc@tcsc-VirtualBox: ~
```

```
tcsc@tcsc-VirtualBox: ~$ vi linux2.sh  
tcsc@tcsc-VirtualBox: ~$ chmod 777 linux2.sh  
tcsc@tcsc-VirtualBox: ~$ ./linux2.sh  
Sum is:125  
tcsc@tcsc-VirtualBox: ~
```

E) Sed:-

Sed command or Stream Editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, find & replace but it can perform other text manipulations like insertion, deletion, search, etc. With sed, we can edit complete files without actually having to open it.

```
tcsc@tcsc-VirtualBox: ~
```

```
subjects offered in cs  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calculus  
computer basic.
```

```
:wq
```

Displaying partital text of a file :-
 with sed, we can view only part of a file rather than seeing whole file.

```
tcsc@tcsc-VirtualBox:~$ vi cs.txt
tcsc@tcsc-VirtualBox:~$ sed -n 3,5p cs.txt
database management
linux
python
tcsc@tcsc-VirtualBox:~$
```

2) Display all except some lines :-

To display all context except some portion, use option 'd'.

```
tcsc@tcsc-VirtualBox:~$ sed 3,5d cs.txt
subjects offered in cs
datastructure
green tech
softskill
stats
calclus
computer basic
tcsc@tcsc-VirtualBox:~$
```

3) Deleting a line :-

To delete a line, use line number followed by 'd'.

```
tcsc@tcsc-VirtualBox:~$ vi linux.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux.sh
tcsc@tcsc-VirtualBox:~$ ./linux.sh
THIS IS LINUX!
tcsc@tcsc-VirtualBox:~$
```

4) Search and Replacing a string :-

's' option is for searching a word.

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```
tcsc@tcsc-VirtualBox:~$ sed 's/cs/computer/' cs.txt  
subjects offered in computer :  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calclus  
computer basic
```

- 5) Replace a string on a particular line :-
To replace a string on a particular line, use line number with 's' option.

```
tcsc@tcsc-VirtualBox:~$ sed '6 s/cs/computer system /' cs.txt  
subjects offered in cs  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calclus  
computer basic
```

- 6) Add a line after (before) the matched string:
To add a new line with some content, use option 'a'.

```
tcsc@tcsc-VirtualBox:~$ sed '/cs/a "this is linux"' cs.txt  
subjects offered in cs ...  
"this is linux"  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calclus  
computer basic  
tcsc@tcsc-VirtualBox:~$
```

To add a new line with some content, use option 'i'.

tcsc@tcsc-VirtualBox:~\$ sed '/cs/i "this is linux"' cs.txt
"this is linux"
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
tcsc@tcsc-VirtualBox:~\$

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7) To change a whole line with modified pattern:-
To change a whole line to a new line when a search
matches, use option 'c'.

tcsc@tcsc-VirtualBox:~\$ sed '/linux/c "this is linux"' cs.txt
subjects offered in cs
datastructure
database management
"this is linux"
python
green tech
softskill
stats
calculus
computer basic

8) Appending lines:-

To add some content before every line, use *
and & as follows.

tcsc@tcsc-VirtualBox:~\$ sed -e 's/.*/Thanks &/' cs.txt
Thanks subjects offered in cs
Thanks datastructure
Thanks database management
Thanks linux
Thanks python
Thanks green tech
Thanks softskill
Thanks stats
Thanks calculus
Thanks computer basic

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