

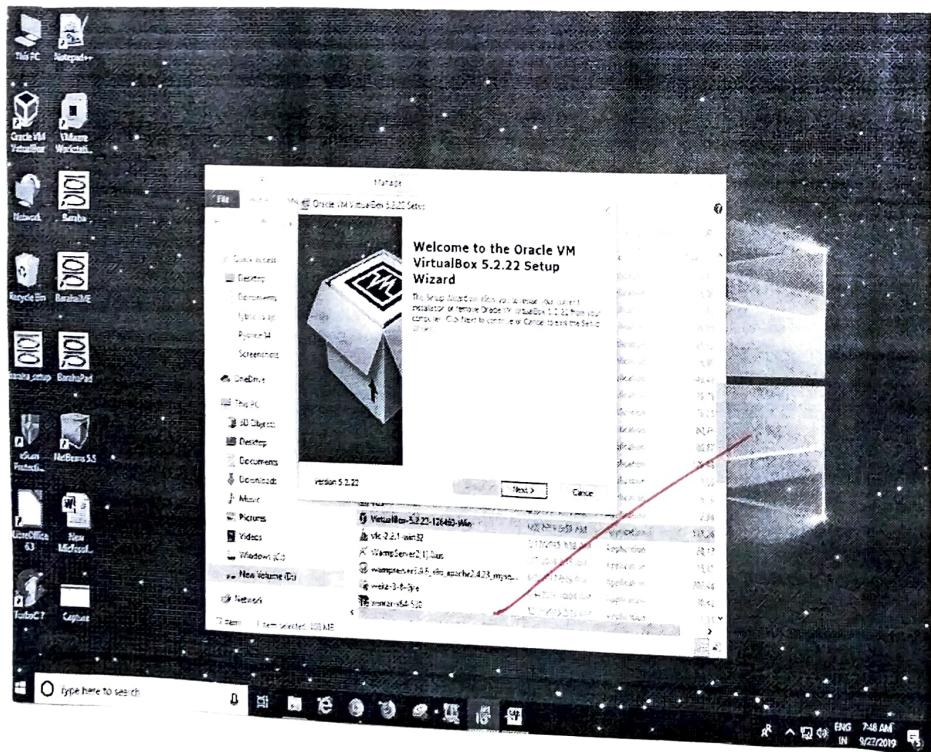
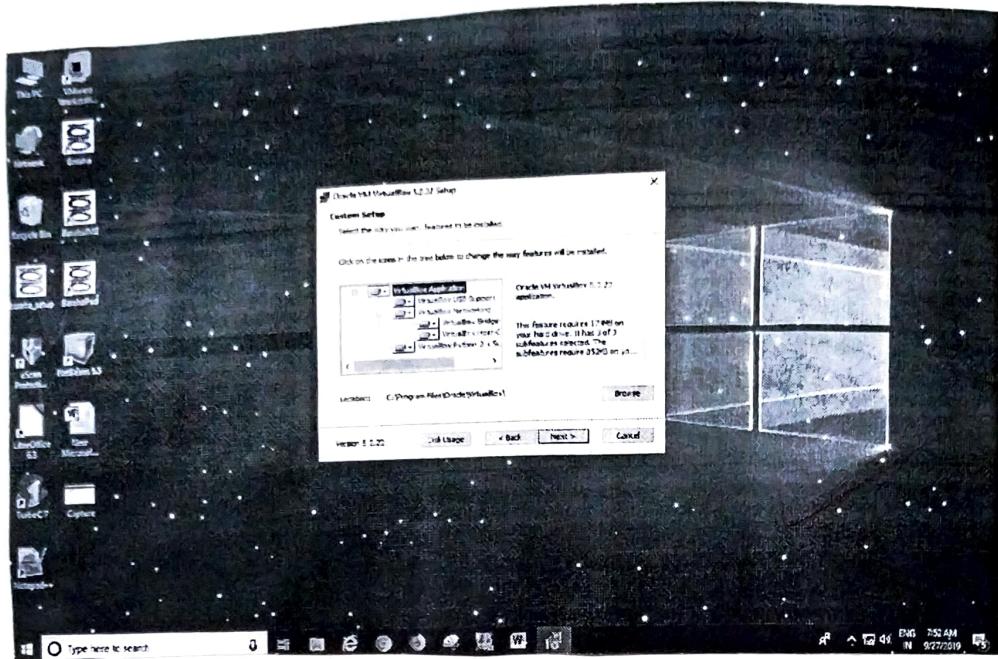


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Aim:

- 1) Install your choice of linux distribution eg: ubuntu, Fedora.
- 2) Customize desktop environment by changing different default options like changing default background, themes, screensavers.
- 3) Screen resolution.
- 4) Time settings.

① Install your choice of linux distribution: using a USB drive.

- Most newer computers can boot from USB. You should see a welcome screen prompting you to choose your language and giving you the option to install Ubuntu. Or try it from USB.
- If your computer doesn't automatically do so, you might need to press the F12 key to bring up the boot menu, but be careful not to hold it down that can cause an error message.

1. Prepare to install Ubuntu

- We recommend you plug your computer into a power source.
- You should also make sure you have enough space on your computer to install Ubuntu.
- We advise you to select Download updates

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- while installing & install this third party software, you should also stay connected to the internet so you can get the latest updates.
- If you are not connected to the internet, you'll be asked to select a wireless network, if available. We advise you to connect during installation so we ensure your machine is up to date.

2 Allocate drive space:

- use the checkboxes to choose whether you like to install Ubuntu alongside another operating system, disable your existing operating system & replace it with Ubuntu or if you're an advanced user choose the 'Something else' option

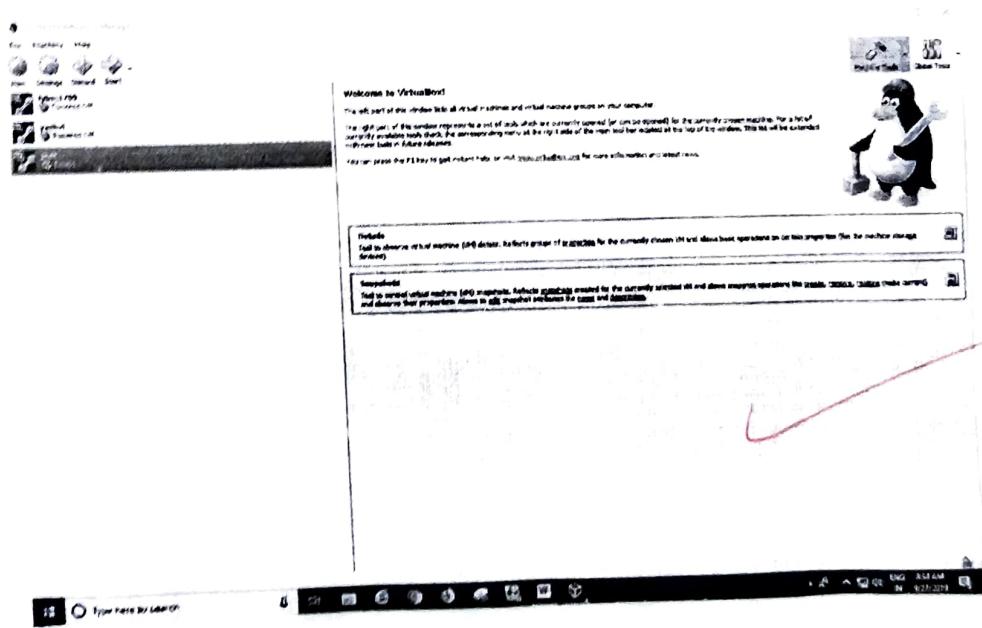
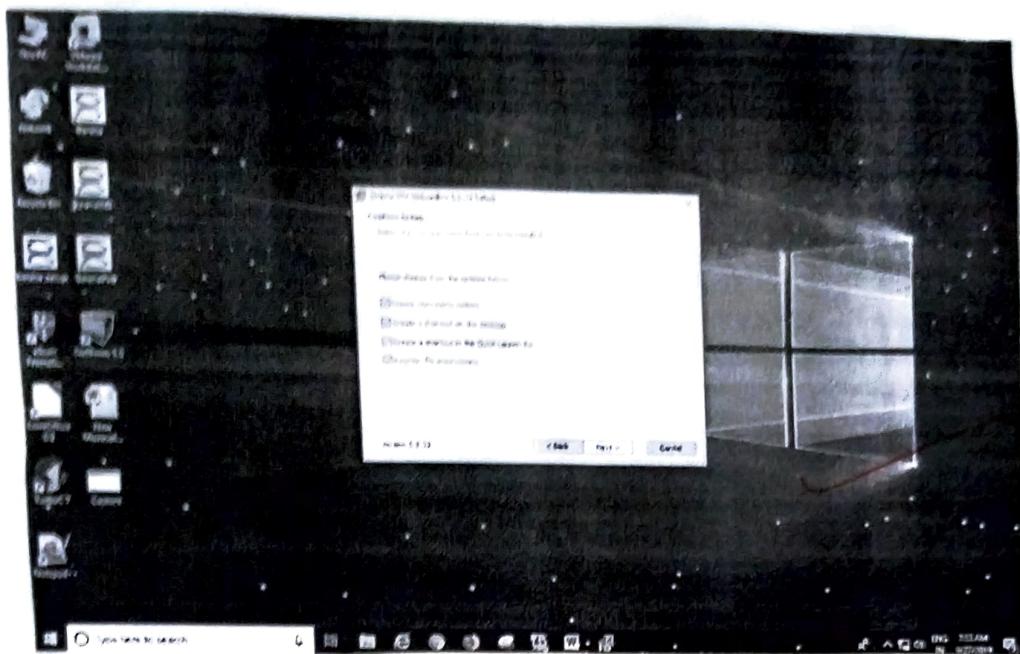
3 Begin the installation:

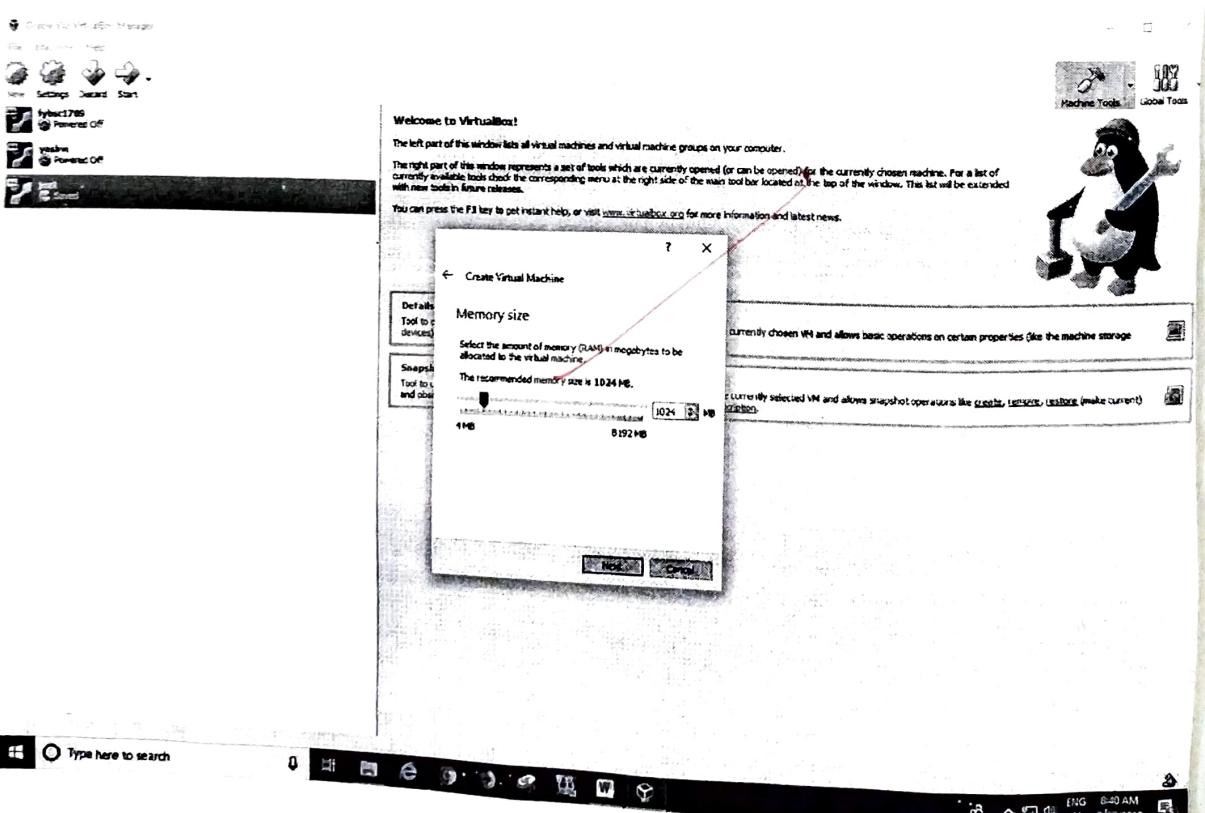
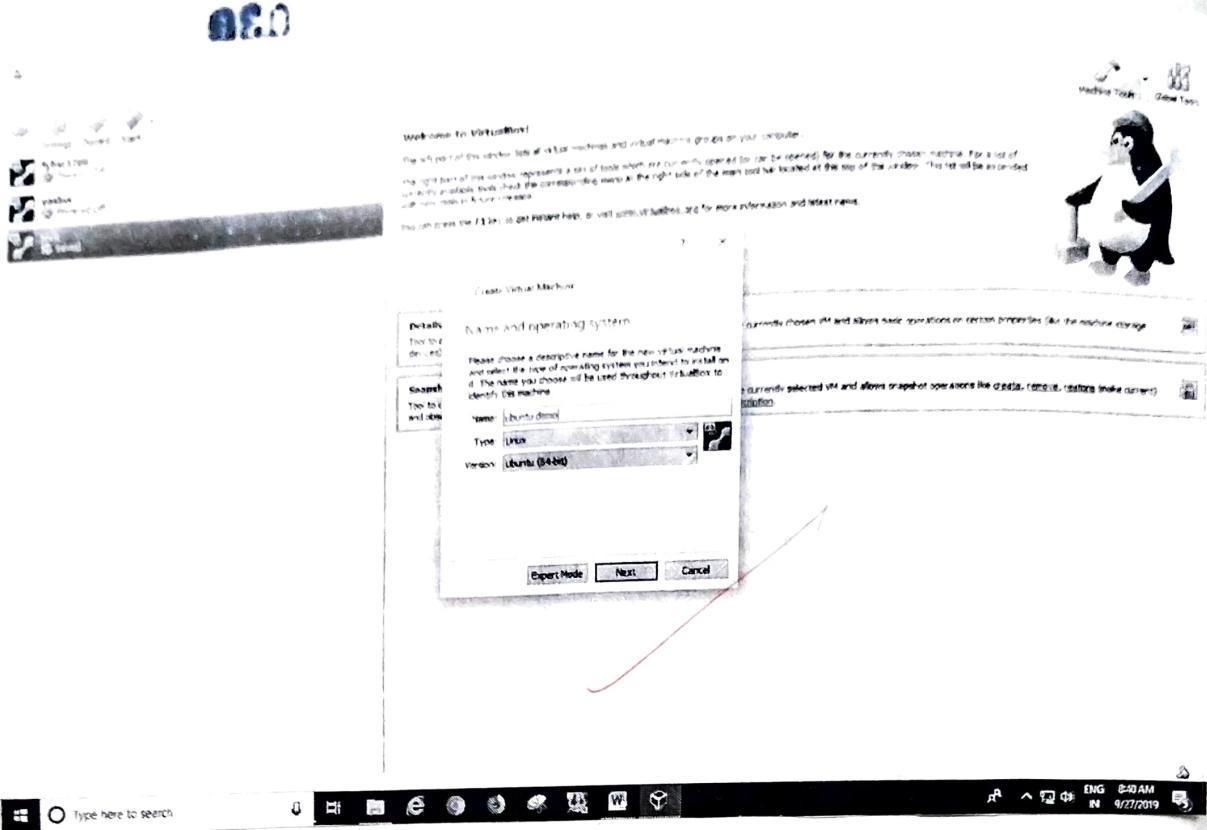
- Depending on your previous, you can now verify that you have chosen the way in which you would like to install Ubuntu.
- The installation process will begin when you click the Install Now button.
- Ubuntu needs about 4.5 GB to install, so add a few extra GB to allow for your files.

4 Select your location:

- If you're connected to the internet, this should be done automatically. Check your location is correct and click 'forward' to proceed. If you're unsure

Q30





of your time zone, type the name of the town you're in or click on the map and we will help you find it.

If you're having problems connecting to the internet, use the menu in top-right hand corner to select a network.

5 Select preferred Keyboard layout:

Click on the language option you need. If you're not sure, click the 'Detect keyboard layout' button for help.

6 Enter your login & password details:

7 Learn more about Ubuntu while the system installs.

8 That's it!

All that's left is to restart your computer & start enjoying Ubuntu.

b) Customization of desktop:

Accessing appearance settings:

- To access appearance settings, let's click on user menu at the top right corner, on the top menu bar & select system settings.
- A window will pop-up with all settings divided into personal, hardware & system options. Select Appearance icon.

Changing wallpaper picture.

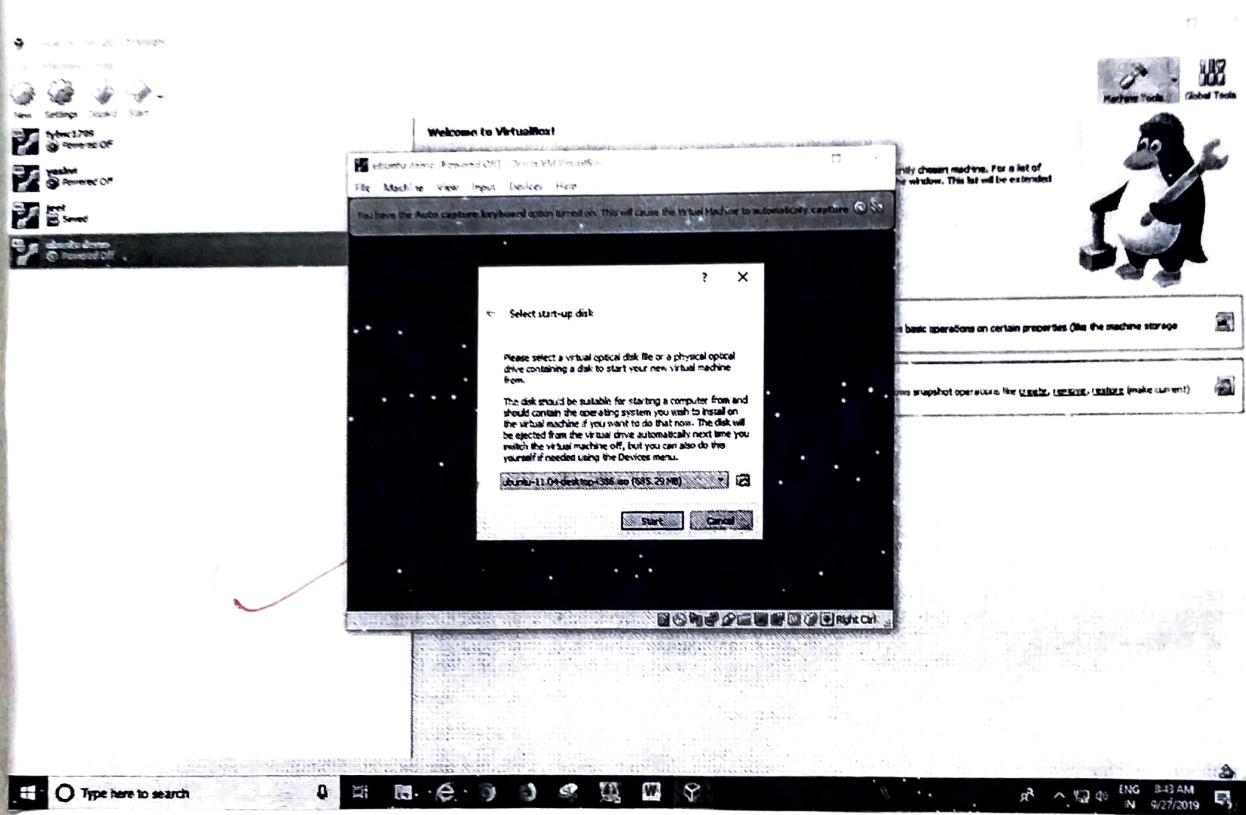
- On the left side, you can see your current wallpaper.
- On the right side is a port where we can select one of Ubuntu wallpapers. Clicking on any thumbnail will change the wallpaper.
- Click dropdown menu above thumbnails & select pictures folder from your pictures folder.
- Select wallpaper from your folders.

Changing Ubuntu Theme.

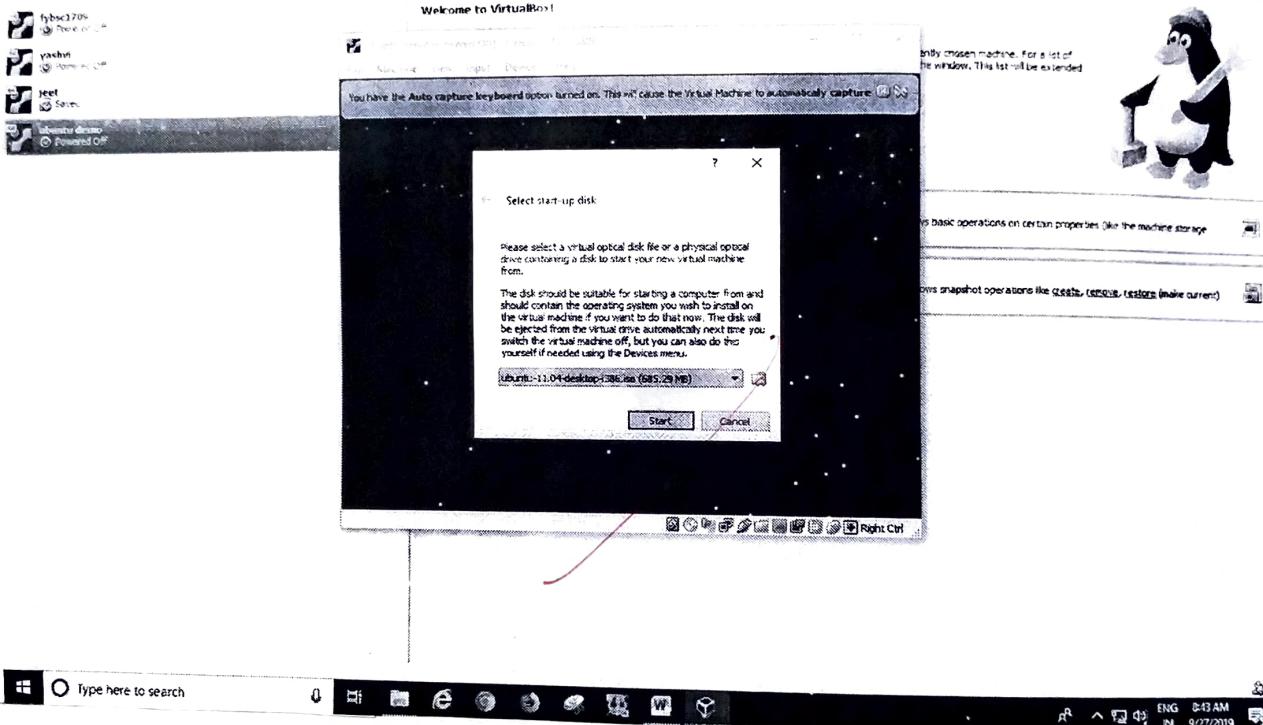
- To click to change the theme, click on drop down menu below the wallpaper thumbnail & choose.
- Ambiance is a light theme that look about more Mac-like while Radiance is the darker brown theme.

③ Screen Resolution:

- You can change how big or small things appear on the screen by changing screen resolution.
- You can change which way things appear by changing the rotation.
- 1. Click the icon on the bar & select system settings.
- 2. Open screen display.
- 3. You can have different settings for each display if you've multiple displays.



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033.

- Select your desired resolution & rotation.
- Click Apply. The new settings will be applied.

- c) Time setting change the time zone of your system.
- If you are currently in Indian time.
 - just click on the clock on top bar.
 - Choose time & date settings,
 - Once the Time & date window opens, choose Manually, so you can change the time & date manually.
 - otherwise choose time-zone from the map.
 - choose automatic.

SS
15/01

Aim: Installing & removing Software.

1] Installing gcc package, verify that it runs & then remove it.

Step 1: First type 'gcc -v' to know if you have already installed gcc compiler or not. If the output is blank then it means that you don't have gcc installed.

Step 2: Type 'sudo apt-get install gcc'. After typing the following command installation will take place.

Step 3: Type 'sudo apt-get install build-essential'. This will install all the library required for C & C++ programming language.

Now to ~~uninstall~~ gcc compiler

In gcc 8.1.0, although there is no top level ~~uninstall~~ target, some directories to have it, in particular ~~gcc~~, so you can do.

Type: cd build/gcc

sudo make ~~uninstall~~.

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

Practical No:3

Q35: utilization of grep, man commands documentation.

- Finding info documentation from the command line: Bring up the info page for the grep command. Bring up the usage section.
→ 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' command.

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) & (backspace-down) keys.

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

QUESTION

- b] Finding man pages from the command line : Bring up the man page for the 'ls' command . Scroll down to the examples section .
- To use the 'man' command simply type -
'man (command name)'
- Now we are going to find the manual for 'ls' command .
Simply type : 'man ls' .
- c) Finding pages by topic : what pages are available that document file compression .
- '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 command line : bring up the man page for the printf lib function . Which manual library function found ?
- The number corresponds to what section of the manual page is from , 1 is user command , while 3 is sysadmin stuff . The man itself explain it & list the std func

there are certain terms that have different pages in different sections, in cases like that you can pass the section no. to the node before the page name to choose which one you want or use `man -c` 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.

By
Rajat

Practical - 4Command 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 the passwd file in / using find command

* # Find /name passwd

- /usr/share/doc/raspi-dep-253/passwd
- /usr/bin/passwd
- /etc/passwd
- /etc/passwd

Find the directory passwd file under root & one-level down

Find / -maxdepth 2 -name passwd
 • /etc/passwd

Find the passwd file under root & 2 level down
 # Find / -maxdepth 3 -name passwd

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

Find the password file b/w sub-directories level 2+.

- # find - maxdepth 3 + maxdepth 5 - name passwd
- /usr/bin/passwd
- /etc/pam.d/passwd

- a) Create a symbolic link to the file you found in last step.
ln -s file1 file2.
- b) Create an empty file example.txt & move it to /tmp directory using relative pathname.
touch example.txt
mv example.txt /tmp
- c) Delete the file moved to /tmp in previous step by absolute method
rm /tmp/example.txt.

Q80

g) find the location of ls, ps, bash commands.
whereis ls

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

whereis ps

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

whereis bash

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

✓
✓✓✓

Q30

```
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
tmpfs           102416  3383372  3326024    51% /
/dev/sda1       7092728      216    511860     1% /dev/shm
tmpfs           512076        4    5116      1% /run/lock
tmpfs           512076        0    512076     0% /sys/fs/cgroup
tmpfs           512076       48    102368     1% /run/user/1000
tmpfs           102416
```

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

```
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,error=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)
```

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

File Operations

1. explore mounted file systems on your computer
→ df -h
2. what are the different ways of exploring mounted file systems on linux?
→ mount

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3 Copying text from files

- cp command
mv command.

4 Archiving and backup the work directory using tar, gzip & bzip2 commands.

- gzip filename.txt

Bzip2 filename.txt

```
jeba@jeba-VirtualBox:~$ ls
Desktop    Downloads    Music    Public    Videos
Documents  examples.desktop  jj    Pictures  Templates
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:/$ tar -cvf data.tar /mnn
tar: data.tar: Cannot open: Permission denied
tar: Error is not-recoverable: exiting now
jeba@jeba-VirtualBox:/$ sudo tar -cvf data.tar /mnn
tar: Removing leading '/' from member names
/mnn/
/mnn/hd/
jeba@jeba-VirtualBox:/$ ls
bin  data.tar  etc      lib      mnn   opt   run   srv  usr
boot dd       home     lost+found  mnt  proc  sbin  sys  var
cdrom dev     initrd.img media   mnt1 root  snap  vmlinuz
jeba@jeba-VirtualBox:/$ cat data.tar
mnn/0000755000000000000000000000000013605376557010365 Sustar rootrootmnn/hd/000075500000
0000000000000000000013605376557010760 Sustar rootrootjeba@jeba-VirtualBox:$ █
```

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.b2z
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.b2z
BZh91AY&SY`e████e███
'Jew$See█1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.b2z
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
█d.txt+0IeoMeee+e█Xzjeba@jeba-VirtualBox:~/jeb$ █
```

SAJ

```
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.gz
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
```

```
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
jeba@jeba-VirtualBox:~/jeb$ patch ,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
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$ █
```

5. Use diff command to create diff of two files
diff filename¹ filename²
6. Use patch command to patch a file
And analyze the patch command again

~~SO
OS/2~~

Q40

Practical - 6

User Environment

- a) Which account you are logged in? How do you find out?
- who command & whoami
- b) Display /etc/shadow file using cat command and understand the importance of shadow file. How it's different than passwd file.
- cat /etc/shadow
- lets with the passwd file, each field in the shadow file is also separated with ":" colon characters, and are as follows:
- Username upto 8 characters, case-sensitive, usually all lowercase. A direct match to the username in the etc/passwd file.
 - Password, 13 character encrypted. A blank entry (::) indicates a password is not required to log in, and a "*" entry indicates the account has been disabled.
 - The number of days since the password was last changed.
 - The number of days before password must be changed (99999 indicates user can many, many years)
 - The number of days to warn user of an expiring password

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

```
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
```

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow  
[sudo] password for jeba:  
root:!$1$18240$0:99999:7:::  
daemon:*$1$16911$0:99999:7:::  
bin:*$1$16911$0:99999:7:::  
sys:*$1$16911$0:99999:7:::  
sync:*$1$16911$0:99999:7:::  
games:*$1$16911$0:99999:7:::  
man:*$1$16911$0:99999:7:::  
lp:*$1$16911$0:99999:7:::  
mail:*$1$16911$0:99999:7:::  
news:*$1$16911$0:99999:7:::
```

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```
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
```

- 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.

- Each field in a passwd entry is separated with ":" colon characters, and are 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 which user.
 - ~~-Numeric group id. Note Red Hat uses group id's in a fairly unique manner for enhanced file security. Usually the group id will match user id.~~
 - Full name of user. Try to keep the length of username under 30 characters.
 - User's home directory. Usually /home/username (e.g. /home/smith). All user's personal files, web pages, mazete will be stored here.
 - User's shell account. Often set to "/bin/bash" to provide access to the bash shell.

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(a) List your current working directory.

→ pwd

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

→ history

! line number

(c) Create alias to most commonly used commands.

→ Alias Command instructs the shell to replace
one string with another string while executing
the commands.

→ alias label = "command".

046

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

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

```
jeba@jeba-VirtualBox:~  
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:~$ ls  
who -l 2020-01-15 20:30 780.tdattey1  
LOGIN tty1 jeba@jeba-VirtualBox:~$ █
```

BR
b~
O

Linux Editor: vi

i) Create, modify, search & navigate a file in editor.

① Creating a file:

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

② Modifying the file:

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

③ Search in a file:

To find a word (forward search) press followed by the word to search.

④ Navigate:

Movement in four directions.

Key	Action
k	Moves cursor up
j	Moves cursor down
b	Moves cursor left
l	Moves cursor right.

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word Navigation

Key

b

e

w

0(zero)

\$

Action

Moves back to beginning of word

Moves forward to end of word

Moves forward to beginning of word

Moves to character ^{first} of a line.

Move to end of line.

scrolling :

Key

Ctrl + F

Ctrl + b

Ctrl + d

Ctrl + u

Action

Scrolls forwards

Scrolls backward

Scrolls half page

Scrolls half page backward

(b) Learn all essential commands like search /^{rg} highlight, show line numbers.

① Replace.

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

048

```
jeba@jeba-VirtualBox: ~
Hello
This is my Linux example
Welcome
Welldone
This is Vi Editor
Thank you
I
:g/my/s//our/gc
```

```
jeba@jeba-VirtualBox: ~
Hello
This is my Linux example
Welcome
Welldone
This is Vi Editor.
Thank you
replace/ with our {y/n/a/g/t/(^E/^\Y)? █
```

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

840

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

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

- ① highlight:
use set hlssearch.
- ② show the line number
use set nu.

89
89.2
89.3

Q10

Practical - 7

Linux Security

- (a) Use of sudo to change user privileges to root.

Create an user named user1.

To give some users root privileges, edit /etc/sudoers using visudo. Enter new line as highlighted below.

- (b) Identify operations that require sudo privileges.

- (c) Modify expiration date for new user using password aging.

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:~\$

50

```
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
```

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.

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

020

```
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:~$
```

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

E: Expiration Date

M: Minimum number of days before password change

m: No.

S: No. of days password is valid.

w: No. of days account is inactive.

No. of days of warning before a password change is required.

Q21

a) Delete newly added user.

052

```
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:~$
```

OSA
OSA ✓

```
jeba@jeba-VirtualBox:~$ ifconfig  
jeba@jeba-VirtualBox:~$ ifconfig  
enp0s3 Link encap:Ethernet HWaddr 00:0c:27:0e:6b:69  
inet addr:10.0.2.15 Brdcast:10.0.2.255 Mask:255.255.255.0  
inet6 addr: fe80::1c0c:27ff:fe0e:6b69/64 Scope:Link  
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
RX packets:2 errors:0 dropped:0 overruns:0 frames: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 frames: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)
```

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

```
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:~$ █
```

Network Management.

- ① Get IP address of your machine using ifconfig.
- ② Get hostname of your machine.
- ③ Use ping to check the network connectivity to remote machines.

Q20

- ② Use of dig command.
- ③ Troubleshooting network using traceroute, route command.
- ④ Use of arp command.

054

```
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:~$
```

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

```
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.           IN      A
;
; 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:~$
```

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

jeba@jeba-VirtualBox:~\$ netstat		Foreign Address		State
Active Internet connections (w/o servers)				
proto Recv-Q Send-Q Local Address				
Active UNIX domain sockets (w/o servers)				
Proto Refcnt Flags	Type State	I-Node	Path	
unix 2 []	DGRAM	42149	/run/user/1000/system	
d/notify		9694	/run/systemd/journal/	
unix 2 []	DGRAM	9695	/run/systemd/journal/	
syslog		9704	/run/systemd/journal/	
unix 36 []	DGRAM	9684	/run/systemd/notify	
dev-log		44042	@/tmp/dbus-CymTe17AQG	
unix 7 []	DGRAM	43331		
socket		42988	@/tmp/dbus-CymTe17AQG	
unix 3 []	STREAM CONNECTED	42690	@/tmp/dbus-CMGGc6G7PS	
unix 3 []	STREAM CONNECTED	13242	/run/systemd/journal/	
unix 3 []	STREAM CONNECTED	43113	/run/systemd/journal/	
stdout		43013		
unix 3 []	STREAM CONNECTED	42935		
stderr				

```
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:~$
```

055

use of host command

use of netstat command & Nmap
command

SJ
Bob

Shell Scripting

Basics of Shell Scripting

- To get a shell, you need to start a terminal.
- To see what shell you have, run : echo \$SHELL
- In Linux, the dollar sign (\$) stands for shell variable
- The echo command just returns whatever you type in
- #!/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.

Echo \$SHELL

- vi filename.sh
- #!/bin/bash
- echo "This is Linux"
- chmod 777 filename.sh
- ./filename.sh.

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

```
tcsc@tcsc-VirtualBox:~  
#!/bin/bash  
echo "THIS IS LINUX!"
```

"linux.sh" [New File]

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

020

```
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:~$
```

Step to write and execute a shell script
 Shell script is just a simple text file with .sh extension, having executable permission.

- a) Open terminal
- b) Navigate to the place where you want to create script using cd command.
- c) Touch filename.sh.
- d) Vi filename.sh [You can use your favorite editor, to edit script]
- e) chmod 777 filename.sh (for making the script executable)
- f) sh filename.sh or ./filename.sh (to run the script).

Program to display your name.

```
#!/bin/bash
echo "Enter your name:"
read name
echo "My name is : $name"
```

Q23

Program to find sum of two variables.

vi filename.sh

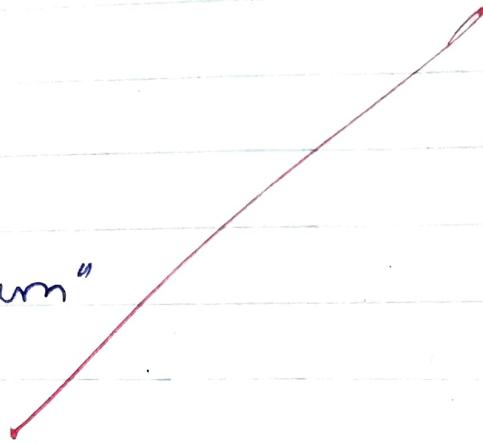
#!/bin/bash

a=100

b=25

sum=\$((a+b))

Echo "sum is: \$sum"



058

```
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:~$
```

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

```
#!/bin/bash  
sum=$(( $1+$2 ))  
echo "sum is:$sum"
```

```
"lin.sh" 3 lines, 46 characters
```

```
tcsc@tcsc-VirtualBox:~$ vi lin.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh  
tcsc@tcsc-VirtualBox:~$ ./lin.sh 50 70  
sum is:120  
tcsc@tcsc-VirtualBox:~$ █
```

059

Program to find sum of two numbers (values passed during execution)

#!/bin/bash

sum=\$(\$1 + \$2)

echo "sum is : \$sum"

Sed:

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

Consider the following text file:

- ① Displaying partial text of a file:

With sed, we can view only a part of a file rather than seeing whole file.

- ② Display all except some lines:

To display all content of a file except for some portion, use option 'd'.

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

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

```
:wq
```

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

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

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

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

```
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
```

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

Deleting a line:

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

Search and Replacing a string:

's' option is for searching a word.

~~Replace a string on a particular line~~

To replace a string on a particular line, use line with 's' option.

FAN

- ⑥ Add a line after/before the matched string
To add a new line with some content
after every pattern match, use option 'a'.

~~To add a new line with some content
before every pattern match, 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:~$
```

```
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
calclus
computer basic
tcsc@tcsc-VirtualBox:~$
```

20

```
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
calclus
computer basic
```

```
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 calclus
Thanks computer basic
```

063

To change a whole line with matched pattern

To Change a whole line to a new line
When a search pattern matches, use option

Appending lines.

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

80
11/02