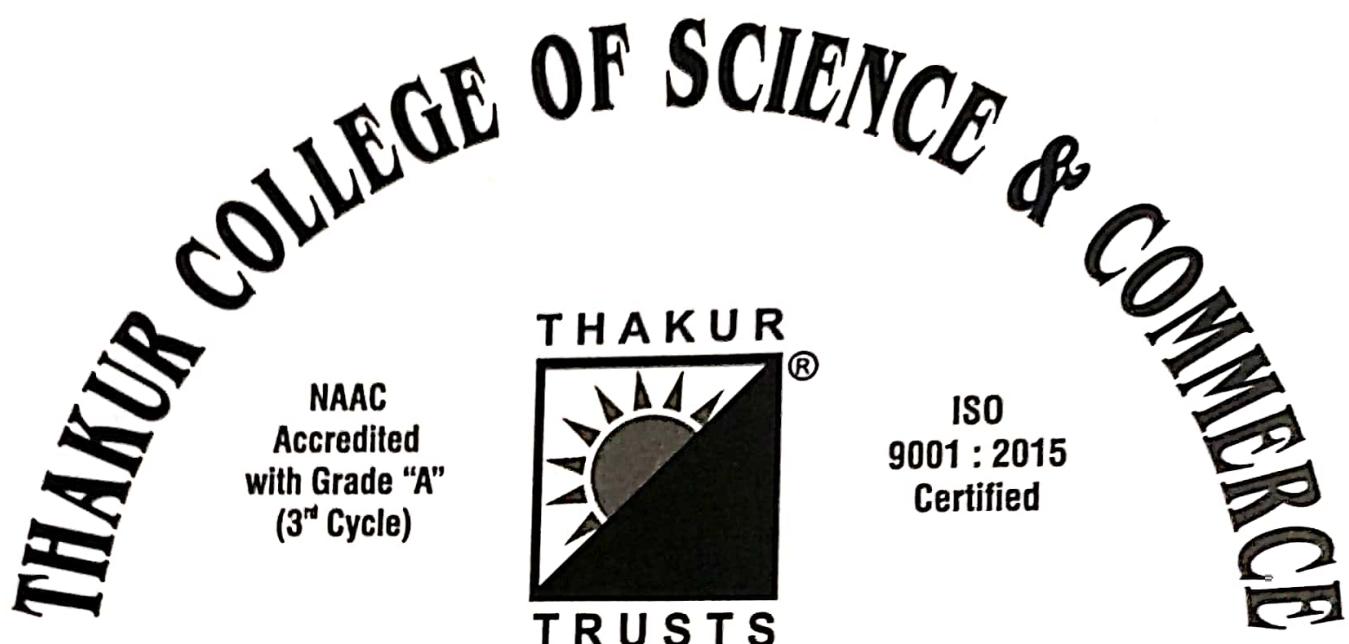


PERFORMANCE

Term	Remarks	Staff Member's Signature
I	<u>Completed</u> very Good	 30/9/19
II	<u>Completed</u>	 11/10/19

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Degree College
Computer Journal
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This is to certify that the work entered in this journal
is the work of Mst. / Ms. Sanjana Alwe

who has worked for the year 2019-20 in the Computer
Laboratory.

Teacher In-Charge

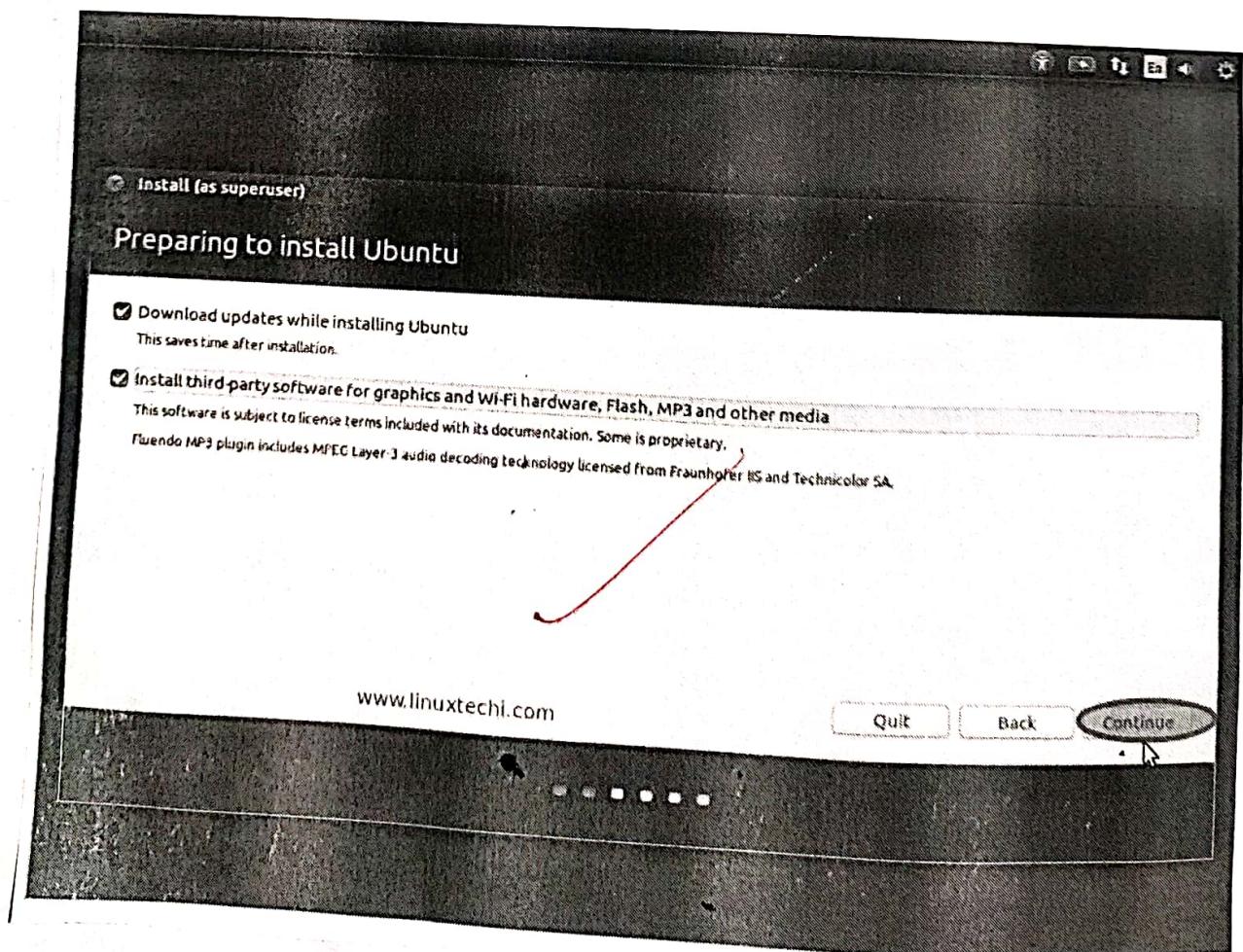
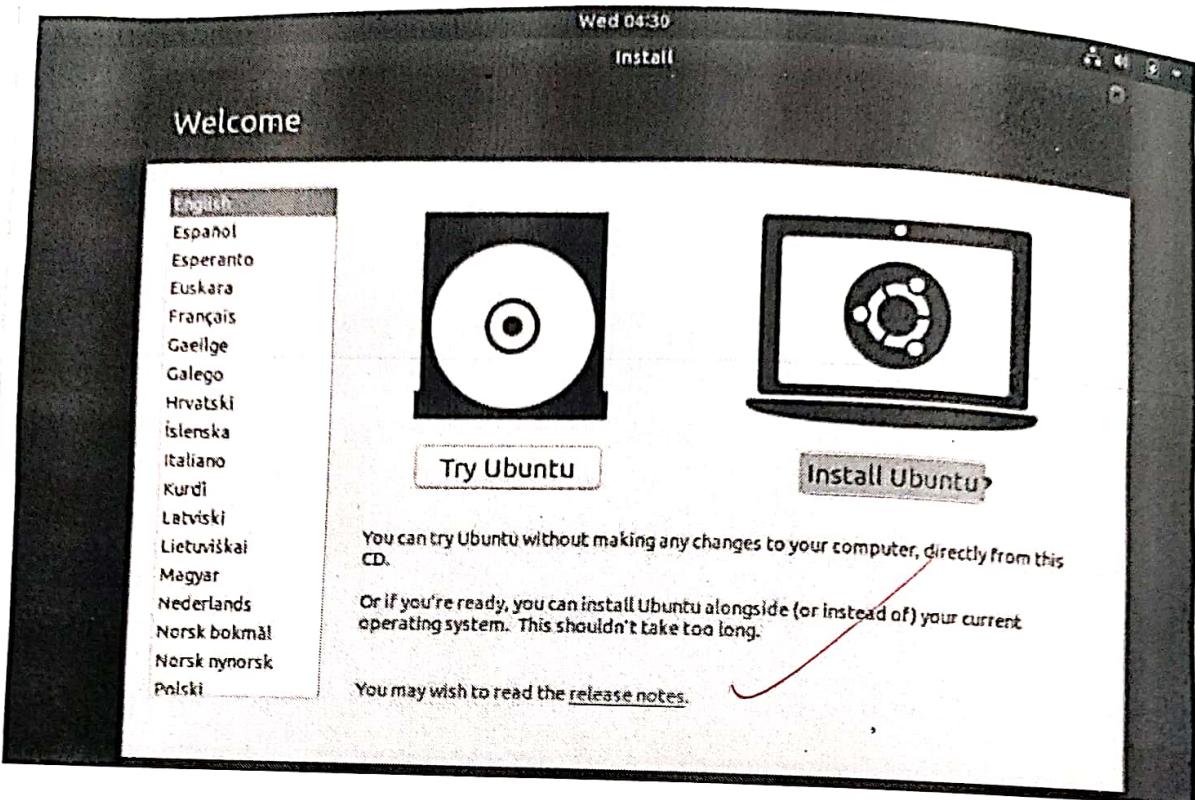
Date : _____

Head of Department

Examiner

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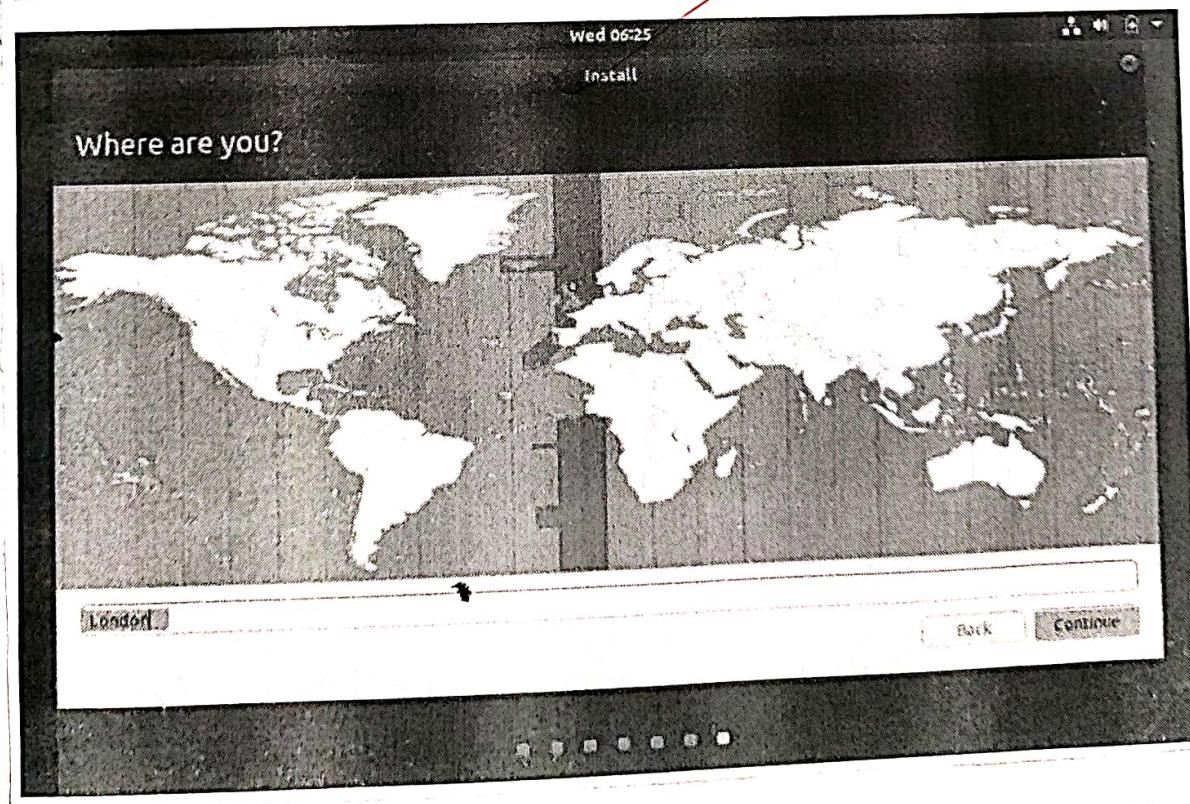
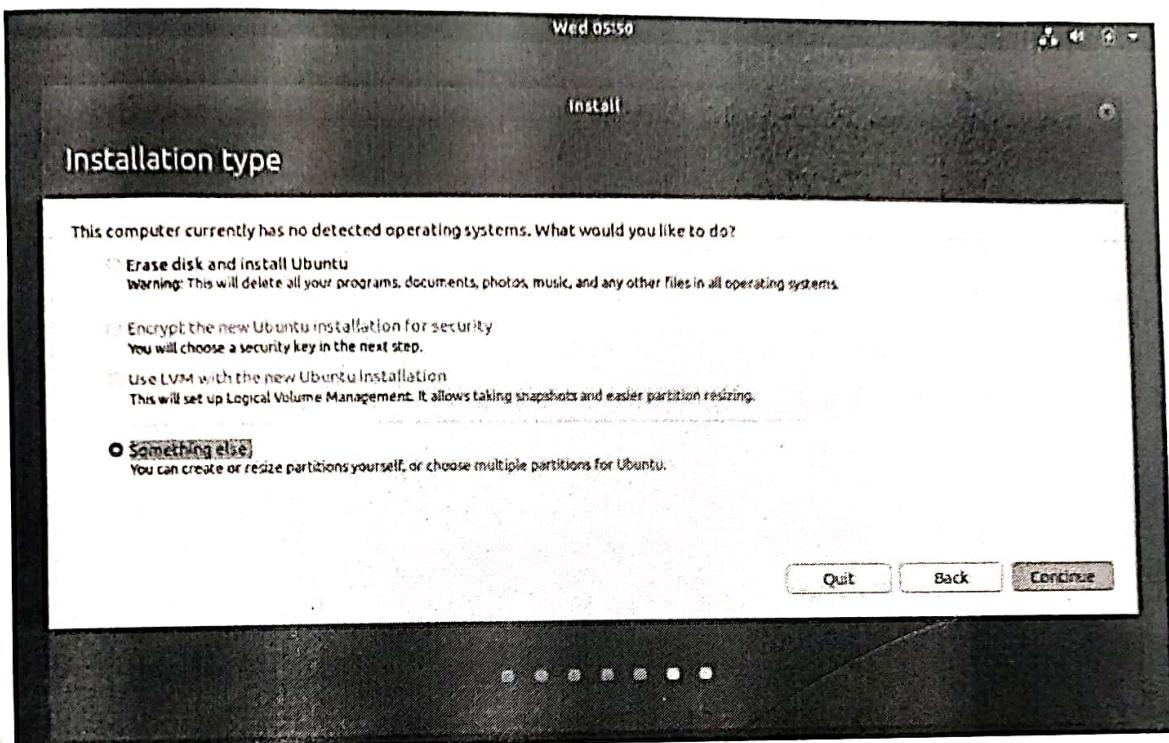
PRACTICAL - 1

Aim: Linux Installation

1. Install your choice of Linux distribution
Eg: Ubuntu, Fedora, Debian.
2. Prepare to install Ubuntu.
 1. Allocate drive space
 2. Use the checkboxes to choose whether you would like to install Ubuntu alongside another operating system, delete your existing operating system and replace it with Ubuntu, or if you are an advanced user choose the 'Something else' option
3. Begin the installation.
 1. Depending on your previous selections, you can now verify that you have chosen the way in which you would like to install Ubuntu.
 2. The installation process will begin when you click the Install Now button.
 3. 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 are connected to the internet, this should be done automatically. Check your location is correct and click 'Forward' to proceed. If you are

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

5. Select your 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 and password details
 7. Learn more about Ubuntu while the system installs
 8. That's it.
All that's left is to restart your computer and start enjoying Ubuntu.
- b) Customize desktop environment by changing different default options like changing default background, themes, screensavers.
- c. Screen resolution: Ascertain the current screen resolution for your desktop. Change the size or rotation of the screen.



QE

Wed 05:15

Install

Keyboard layout

Choose your keyboard layout:

- English (Australian)
- English (Cameroon)
- English (Ghana)
- English (Nigeria)
- English (South Africa)
- English (UK)
- English (US)**
- Esperanto

- English (US)**
- English (US) - Cherokee
- English (US) - English (Colemak)
- English (US) - English (Dvorak)
- English (US) - English (Dvorak, alt. intl.)
- English (US) - English (Dvorak, intl., with dead keys)
- English (US) - English (Dvorak, left-handed)
- English (US) - English (Dvorak, right-handed)
- English (US) - English (Macintouch)

Type here to test your keyboard

Detect Keyboard Layout

Quit

Back

Continue

Wed 07:28

Install

Who are you?

Your name:

Your computer's name:

The name it uses when it talks to other computers.

Pick a username:

Choose a password: Strong password

Confirm your password: ✓

Log in automatically

Require my password to log in

Back

Continue

You can change how big or detailed things appear on the screen by changing the screen resolution.

You can change which way up things appear by changing the rotation.

d) Time settings change the time zone of your system

Y
Oct/10

Use Notes: Settings about auto adjust

Windows automatically adjusts with location after new installation

Time and Region Step 1: Click Start
Region and Language Step 2:
Change the location

Region and Language

Step 3: Click Additional Options
such as, Clock and Region
Shows you a lot of options

PRACTICAL - 2

Aim: Installing and removing software

- a. Install gcc package, verify that it runs and 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 libraries required for C and C++ programming language.

Now to install GCC compiler:

In GCC 5.1.0, although there is no top-level uninstall target, some directories do 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 major executables like gcc, g++, cpp... contained in that directory.

~~By
out of~~

PRACTICAL - 3

Aim: 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.

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' 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 compound 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 the examples section.

ans: 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 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, etc.

d. Finding man pages by section from the cmd lines bring up the man page for the ~~printf lib~~ function which ~~manual~~ page section are ~~library~~ function found.

ans: The ~~number~~ corresponds to what section of the manual page is from is user command while 8 is sysadmin stuff. The man page for man itself explain if we list the std out.

There are certain terms that have different pages in different pages in different sections ; In cases like that you can pass the section no. to the man before the page name to choose which one you want or use man-all to show every matching page in a how

You can tell what section a term falls in which man-k equivalent be apropos (command). It will do substring matches too. so you need to use 'term' to limit p to the first

- e- Command line help list the available options to the mkdir command. How can you do this

\$ mkdir -m a=rwx directory main name

PRACTICAL - 4

Aim: 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 the `passwd` file in / using find command

find / - name passwd

- /usr/share/doc/nss-1dap-253/pam.d/passwd
- /usr/bin/passwd
- /etc/pam.d/passwd
- /etc/passwd.

Find the directory `passwd` file under root and one level down

find / - max depth 2 -name passwd

- /etc/passwd

Find the password file under root and 2 level down

```
# find / - maxdepth 3 -name password
• /usr/bin/passwd
• /etc/pam.d/passwd
• /etc/passwd.
```

Find the password file between sub-directories level 2 and 4

```
# find - maxdepth 3 -maxdepth 5 -name password
• /usr/bin/passwd
• /etc/pam.d/passwd
```

d. Create a symbolic link to the file you found in last step

```
# ln -s file1 file2
```

e. Create an empty file example.txt and move it to tmp directory using relative pathname

```
# touch example.txt
# mv example.txt /tmp
```

1. delete the file moved to /tmp in previous step by absolute method

rm /tmp/example.txt

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

80
11/6/1

PRACTICAL - 5

Aim: file operation

1. Explain mounted file system on your computer

→ df -k

2. What are different ways to exploring mounted file system on Linux

→ mount

```
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:~$
```

```
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=94436k,nr_inodes=123669,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)
```

5. Copying text, from files.

6. cp command, mv command

7. Archiving and back up the work directory using tar, gzip and bzip 2 commands

→ gzip filename.txt

Bzip filename.txt

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 using command again

```
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
```

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt
hi
hi
hi
^C
jeba@jeba-VirtualBox:~/jeb$ cat >htt.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt htt.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
+++ htt.txt     2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$
```

8
8/62

S.P

```
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
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
```

PRACTICAL - 6

- a. Which account you are logged in How do you find out?

Ans: who command and who am i

- b. Display /etc/shadow file using cat command and understand the importance of shadow file. How its different that pass wd file

Ans: cat /etc/shadow

As with the pass wd file, each field in the shadow file is also separated with ":" colon characters and are as follows:

- Username, up to 8 characters (are sensitive, usually all lowercase - A direct match to the username in the ~~/etc/passwd~~ file)
- Password, 13 character encrypted. A blank entry (eg '') indicated a password is not required to login (usually a bad idea) and "*" entry (eg '*') indicates the account has been disabled
- The number of days (since year January 1970)

since the password was last changed

- The number of days before password may be changed to indicates it may be changed at any time
- The number of days which password must be changed (99999) indicates user can keep this on her password unchanged for many many years)
- The number of days to warn user for an expiring password (7 for a full week)
- The number of days since January 1, 1970 that an account has been disabled.
- A reversed field for possible future use.
 - Each field in a password entry is separated with ":" colon characters are as follows:
 - Username upto 8 characters case sensitive, usually all lower case
 - An 'x' in the password field.
 - Numeric user id. This is assigned by the "adduser" script.
 - User's shell account often set to "/bin/bash" to provide access to the bash shell

```
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:::
```

```
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:/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
```

```
jeba@jeba-VirtualBox: ~  
jeba@jeba-VirtualBox:~$ pwd  
/home/jeba  
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:~$ !3  
who -l  
LOGIN      tty1      2020-01-15 20:30  
jeba@jeba-VirtualBox:~$ █ 789 id=tty1 .
```

```
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:~$ █
```

c. Get your current working directory
Ans: pwd

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

! line numbers

e. Create alias to most commonly used
command

Ans: alias label="command"

~~802~~

PRACTICAL - 7

Aim: Linux Editor Vi

i. a. Create, modify, search and navigate a file in editor

ii. Creating a file:

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

iii. Modifying the file

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

iv. Search in a file:

→ To find a word (Forward search) press F followed by the word to search

v. Navigate

movement in four directions

key	Action
k	moves cursor up
j	moves cursor down
h	moves cursor left
l	moves cursor right

```
○○○ jeba@jeba-VirtualBox ~  
Hello  
This is my Linux example  
Welcome  
Welldone  
This is VI Editor  
Thank you  
-  
I  
:g/mys//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/q/l/o/e/yy)? █  
○○○ jeba@jeba-VirtualBox ~  
Hello  
This is our Linux example  
Welcome  
Welldone  
This is VI Editor  
Thank you  
-
```

5A

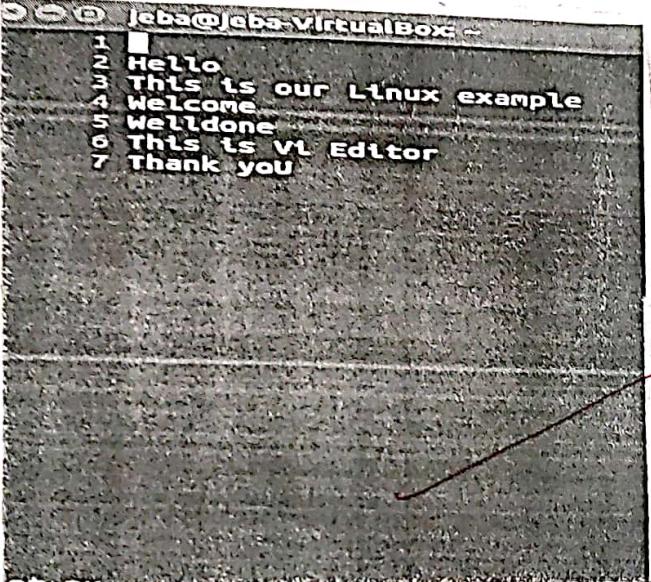
Q: Show the line number.

Use set hu

→ print out of code
easy to see where changes made
and what changes made

changes done between different files

changes done in same file



```
jeba@jeba-virtualBox ~
1
2 Hello
3 This is our Linux example
4 Welcome
5 Welldone
6 This is VI Editor
7 Thank you
```

8
8/02

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

```
# 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
```

```
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
```

PRACTICAL - 8

Aim - 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 operation that requires sudo privileges

c. Modify expiration date for new user using password aging

E → Expiration Date

M → minimum number of days before password change

N → number of days password is valid

I → account inactive

W → Number of days of warning before a password change is required

d. Delete newly added user

```
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
Last password change
Password expires : Jan 21, 2020
Password inactive : Aug 08, 2020
Account expires : never
Minimum number of days between password change : Jan 31, 2020
Maximum number of days between password change : 100
Number of days of warning before password expires : 200
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ sudo chage -E 25/01/2020 --m 10 --M 98 --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 : 98
Number of days of warning before password expires : 30
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:~$
```

*SJ
1/2022*

```
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)
```

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

PRACTICAL - 9

Aim: Network management

- a. Get IP address of your machine using
In config



- b. Get host name of your machine



- c. Use ping to check the network connecting
to remote machines



- d. Use of dig command
→
- e. Trouble shooting command using trace route
→
- f. Use of arp command
→

```
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:~$
```

```
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: 4696
: 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 22:49:06 IST 2020
: MSG SIZE rcvd: 59
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:~$ 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:~$ arp  
Address          HWtype  HWaddress          Flags Mask  
10.0.2.2        ether    52:54:00:12:35:02  C          Iface  
3                                         enp0s
```

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

```
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            42149  /run/user/1000/system  
d/notify  
unix  2      [ ]     DGRAM            9694   /run/systemd/journal/  
syslog  
unix  16     [ ]     DGRAM            9695   /run/systemd/journal/  
dev-log  
unix  7      [ ]     DGRAM            9704   /run/systemd/journal/  
socket  
unix  3      [ ]     DGRAM            9684   /run/systemd/notifly  
unix  3      [ ]     STREAM  CONNECTED    44942  @/tmp/dbus-CymTeI7AQG  
unix  3      [ ]     STREAM  CONNECTED    43331  @/tmp/dbus-CymTeI7AQG  
unix  3      [ ]     STREAM  CONNECTED    42988  @/tmp/dbus-CymTeI7AQG  
unix  3      [ ]     STREAM  CONNECTED    42698  @/tmp/dbus-CMGGc6G7PS  
stdout  
unix  3      [ ]     STREAM  CONNECTED    13242  /run/systemd/journal/  
stderr  
unix  3      [ ]     STREAM  CONNECTED    43113  /run/systemd/journal/  
unix  3      [ ]     STREAM  CONNECTED    43013  42935
```

g) Use of host host command
→

h) Use of netstat command and nmap command

←

~~8/02~~

PRACTICAL - 10

Aim: Shell scripting

Basics of shell scripting

- a. To get a shell, you need to start a terminal
- b. To see what shell you have 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

```
vi filename.sh
#!/bin/bash
echo "THIS IS LINUX"
```



```
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:~$
```

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

:wq

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

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
- e. chmod 777 filename.sh
- f. sh filename.sh or ./filename.sh

~~Program to display your name~~

```
#!/bin/bash
Echo "Enter your name:""
Read name
Echo "My name is : $name"
```

Program to find sum of two variables

```
#!/bin/bash
```

```
a=100
```

```
b=25
```

```
sum=$((a+b))
```

```
Echo "sum is : $sum"
```

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.

Consider

1. Displaying partial text of a file.
With sed, we can view only 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:~$ 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:~$
```

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

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

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

```
tcsc@tcsc-VirtualBox:~  
#!/bin/bash  
sum=$(( $1+$2 ))  
echo "sum is:$sum"  
  
lin.sh 3 lines, 46 characters
```

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

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

```
:wq
```

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

Deleting a line

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

Search and Replace a string

's' option is for searching

Use line number with 's' option to replace a string on particular line.

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 'i'

To change a whole line with matched pattern

To change a whole line to a new line when a search ~~pattern~~ matches, use option 'c'

Appending lines

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

83

109
11/10d

```
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 '6 s/cs/computer system /' cs.txt  
subjects offered in cs  
datastructure  
database management  
linux  
python  
green tech  
softskill  
stats  
calculus  
computer basic
```

```
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:~$
```

```
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
```

```
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
```