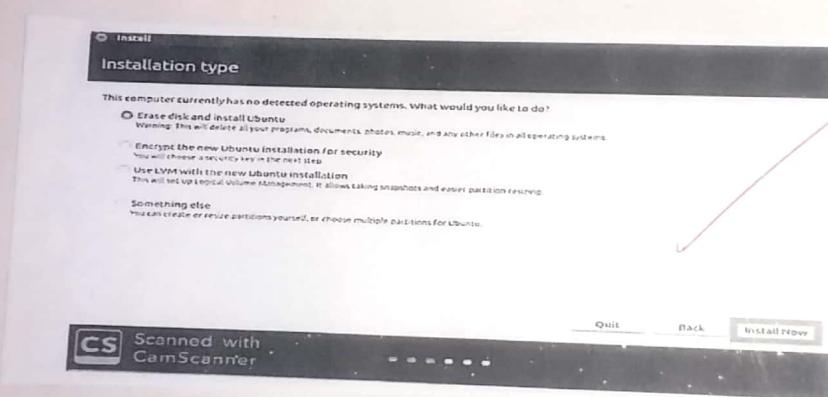
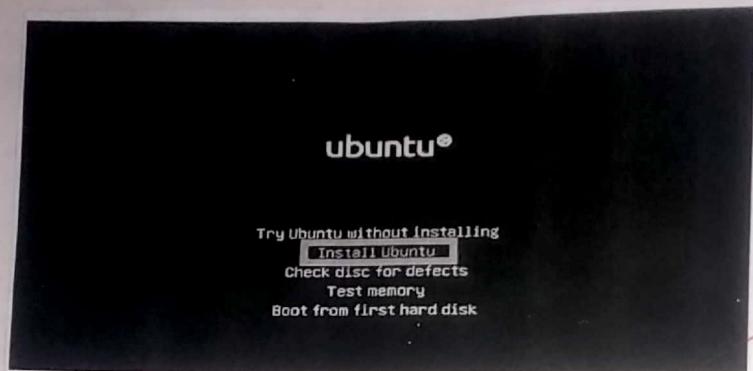


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No.



Practical no.1

Aim:-

1. Install your choice of Linux distribution  
e.g. Ubuntu, fedora
2. Customize desktop environment by changing different default option like changing default backgrounds, themes, screensaver.
3. Screen Resolution
4. Time settings

a. Install your choice of Linux distribution e.g. Ubuntu, Fedora.

using a USB device

→ Most modern 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.

b. 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.

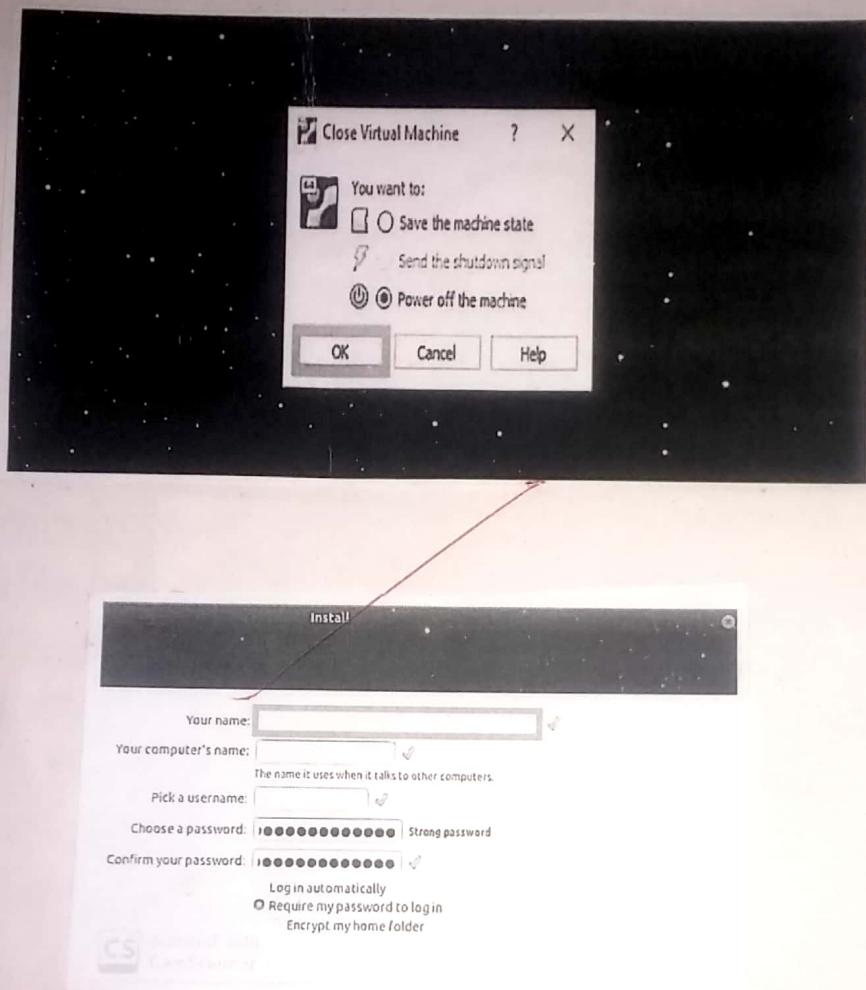
- \* We advise you to select download updates.
- \* While installing and installing and install this third-party software now.
- \* You should also stay connected to the internet so you can get the latest updates while you install Ubuntu.
- \* If you are not connected to the internet, you will be asked to select a wireless network if available. We advise you to connect during the installation so we can ensure your machine is up to date.

## 2. Allocate drive space

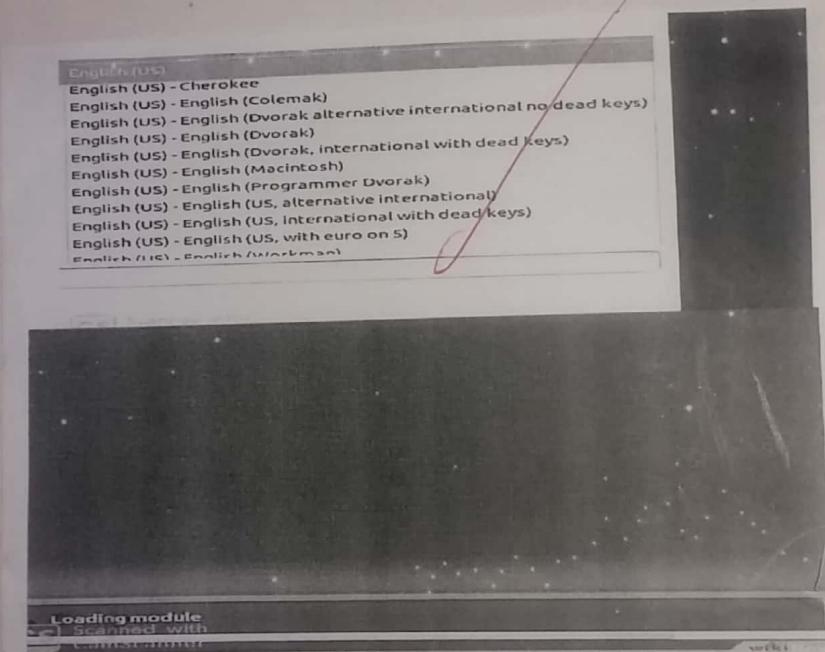
- \* Use the checkboxes to choose whether you had like to like install Ubuntu alongside another operating system. Delete your existing O.S. and replace it with Ubuntu, or if you are an advanced user choose the something else option.

## 3. Begin the installation:-

- Depending on your previous selection, you can verify that you can choose the way in which you would like to install Ubuntu.
- The installation process will begin when you click the installation now button.
- Ubuntu needs about 4.5 GB to install so add new feature to allow your files.



as



5. Select your preferred keyboard output:  
 → click the language option you need. If you are 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.

9. Customizing desktop environment by changing different default options like changing default background, themes.

→ \* Accessing appearance settings

To access appearance settings in Ubuntu let's click on user menu at the top right corner on the top menu bar and select system settings.

\* A window will pop-up with all settings divided into personal, hardware and system option icons. Let's first select the appearance icon.

→ changing wallpaper picture:

→ On the left side of the background part, you can see your current wallpaper.

→ On the right side is part where we can select one of Ubuntu wallpaper. Clicking any wallpaper will be changed right away a floating effect.

Aim: Installing and removing software.

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

Step1:

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.

Step2:

Type 'sudo apt-get' installed gcc' After typing the following command installation will take place.

Step3:

Type 'sudo apt-get installed build-essential'; This will install all the libraries required for C and C++ programming language.

Now to install ACC complete.

In GICC 5.1.0, although there is no top level uninstall target, some direction do have it, in particular g2c, so you can do.



Type: cd \$ build/gcc  
sudo make uninstall.

This does not remove everything that was installed,  
but it remove major executable like gcc, g++,  
CPP--- contained in that directory.

~~88%  
26°~~

Aim:- utilization of grep, man commands.

Documentation:-

- a. Finding info documentation from the command line:- bring up the info page for the grep command, bring up the usage section.

Aus:- To find info about my command 'info' command is used the syntax of info command 'in' "info (Command name)".

We are giving to bind the info about the group command:

Open the terminal (ctrl+alt+t) and  
type: info group

After typing this command following output will be displayed onto your screen.

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

## output: ~ .info

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This is info main menu (aka directory mode)

A few useful info commands

'q' quits;

'?' list all info commands;

'h' start info tutorial;

'm' Texinfo RFT visit the text info command etc;

: ~ \$ man/s

## output: Name

ls - list directory contents

Synopsis:-

ls [option] - [file] -

Description:

List information about the file seat entries alphabetical

-lly if none of -iB -tuvswc nor -sort is specified

--a, -- all

do not list implied and -

--author

with -l print the author of each file

--b, -- escape

print -s title escapes the non-~~geo~~ geographical  
characters

--C

list entries by columns

--n \$ man tar.

synopsis:

[for [A] A - concatenate / c - - create / d - - diff.  
compare / . - - delete / s1 - - append]

[. - - list / . - - test - label / u - - update / r - extract -  
[option] [pathname. - ]

Description: Tap store and extracts file from a tap or dish  
to archive.

function letters:

- A - calculate - - concatenate append for file to  
archive.

- C, - - create  
create a new archive.

- d, - - diff - - compare

find differences between archive and files system.

- delete  
delete from the archive.

- s1, - - append  
append files to end of an archive.

~ \$ man & print f

Name , printf, sprintf, fprintf, dprintf, snprintf, uprint,  
vfprintf, vsnprintf, formatted output version.

Description:

the function in the print() family produce  
output according to a format as described below.

Another mode summarized from of showing info is the 'man' command. The command is same as 'info' but required data.

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

Aus: 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].

Aus: 'tar', 'zip' are same man page which are available for document file compression

simply type: man zip  
man tar

- Q) Finding man pages by section from cmdline  
 bring up the man page from the `printplib` function which manual page section are library function found.
- b) The number corresponds to what section of the manual page is 1 for user command, while 8 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 section (e.g. `cpio` as a command appears in section 1 as `larchplib`' function appears in section 3.) 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 -a` to show every matching page in a row.  
 You can tell what section a terms falls in with `man -k` (equivalent to `apropos` command). It will do something matches too. So you need to use "TERM" to limit.
- c) Command-line help list the available options for the `mkdir` command. How can you do this?  
`$ mkdir -m a=rwx directory name.`

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command line operation:-

1) Install a new package on your system.

→ sudo apt-get install [package name]

2) Remove the package installed

→ sudo apt-get remove [package name]

3) Find the passwd file in / using find command

→ # find / -name passwd

- /usr/share/doc/libpam-0.53/pam.d/passwd
- /usr/bin/passwd
- /etc/passwd/passwd
- /etc/passwd

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

= find / -maxdepth 2 -name passwd • /etc/passwd

Find the passwd file under root and one level down

= find / -maxdepth 3 -name passwd

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

Find the passwd file b/w sub-directories level 2 & 4

→ # find - max depth 3 - maxdepth 5 - name pass  
 • /user/bin/passwd  
 • /etc/passwd

# create a symbolic link the file you found in the last step.

# ln -s file1 file2

c) create an empty file example.txt & move it to  
 1) tmp directory using relative pathname  
 → # touch example.txt  
 # mv example.txt /tmp

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

c) # rm /tmp/example.txt.

g) Find the location of ls , ps , bash commands

# whereis

to: /bin /S/usr/share/man/man1/ls/.gz .

n) where is ps

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

# where is bash

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

File operation:

1> explore mounted file system on your computer  
Aus: df -K

2> what are different ways of exploring mounted file system on Linux?  
Aus: mount.

3> copying text from files.  
Aus: cp , command, mv command.

4> Archiving and backup the work directory using tar, gzip, and bzip commands  
Aus: gzip filename.txt , Bzip2 filename.txt

5> Use diff command to create diff of two files  
Aus: diff filename1 /filename2.

6> use patch command to patch a file. bind analyze the patch using patch command again.

```
#!/bin/bash -e
# mount
sysfs=/sys
mount -t sysfs none $sysfs
# proc
proc=/proc
mount -t proc none $proc
# devpts
devpts=/dev/pts
mount -t devpts none $devpts
# /run
run=/run
mount -t tmpfs none $run
# /sys/kernel/security
securityfs=/sys/kernel/security
mount -t securityfs none $securityfs
# /dev
dev=/dev
mount -t devtmpfs none $dev
# /sys/fs/cgroup
cgroup=/sys/fs/cgroup
mount -t cgroup none $cgroup
# /sys/fs/pstore
pstore=/sys/fs/pstore
mount -t pstore none $pstore
# /sys/fs/cgroup/cpu,cpuacct
cpuacct=/sys/fs/cgroup/cpu,cpuacct
mount -t cpuacct none $cpuacct
# /sys/fs/cgroup/net_cls,net_prio
net_prio=/sys/fs/cgroup/net_cls,net_prio
mount -t cpuacct none $net_prio
# /sys/fs/cgroup/pid
pid=/sys/fs/cgroup/pid
mount -t pid none $pid
# /sys/fs/cgroup/freezer
freezer=/sys/fs/cgroup/freezer
mount -t freezer none $freezer
# /sys/fs/cgroup/devices
devices=/sys/fs/cgroup/devices
mount -t devices none $devices
# /sys/fs/cgroup/memory
memory=/sys/fs/cgroup/memory
mount -t memory none $memory
# /sys/fs/cgroup/bikts
bikts=/sys/fs/cgroup/bikts
mount -t bikts none $bikts
# /sys/fs/cgroup/perf_event
perf_event=/sys/fs/cgroup/perf_event
mount -t perf_event none $perf_event
# /sys/fs/cgroup/hugepages
hugepages=/sys/fs/cgroup/hugepages
mount -t hugepages none $hugepages
# /sys/fs/cgroup/hugepages/huge16
huge16=/sys/fs/cgroup/hugepages/huge16
mount -t huge16 none $huge16
# /sys/fs/cgroup/hugepages/huge2M
huge2M=/sys/fs/cgroup/hugepages/huge2M
mount -t huge2M none $huge2M
# /sys/fs/cgroup/hugepages/huge4K
huge4K=/sys/fs/cgroup/hugepages/huge4K
mount -t huge4K none $huge4K
# /sys/fs/cgroup/hugepages/huge1G
huge1G=/sys/fs/cgroup/hugepages/huge1G
mount -t huge1G none $huge1G
# /sys/fs/cgroup/hugepages/huge512M
huge512M=/sys/fs/cgroup/hugepages/huge512M
mount -t huge512M none $huge512M
# /sys/fs/cgroup/hugepages/huge1024M
huge1024M=/sys/fs/cgroup/hugepages/huge1024M
mount -t huge1024M none $huge1024M
# /sys/fs/cgroup/hugepages/huge2048M
huge2048M=/sys/fs/cgroup/hugepages/huge2048M
mount -t huge2048M none $huge2048M
```

```
jeba@jeba-VirtualBox:~$ ls
Desktop  Downloads  Music  Public  Videos
Documents  examples  desktop  DJ  Pictures  Templates

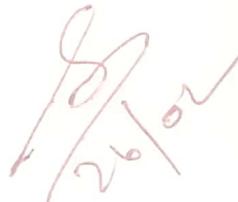
jeba@jeba-VirtualBox:~/Desktop$ jebS
jeba@jeba-VirtualBox:~/Desktop$ jebS cat .gg.txt
cat: .gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/Desktop$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/Desktop$ cat >gg.txt
welcome
Linux
Linux
jeba@jeba-VirtualBox:~/Desktop$ touch dd.txt
jeba@jeba-VirtualBox:~/Desktop$ ls
dd.txt  gg.txt
jeba@jeba-VirtualBox:~/Desktop$ jebS cp gg.txt dd.txt
jeba@jeba-VirtualBox:~/Desktop$ jebS cat dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/Desktop$ cat dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/Desktop$
```

```
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
Scanned with
[redacted] CamScanner
jeba@jeba-VirtualBox:~/jeb$
```

```
ba@jeba-VirtualBox:~/JebS bzip2 ss.txt  
ba@jeba-VirtualBox:~/JebS ls  
.txt  
ss.txt.bz2  
ba@jeba-VirtualBox:~/JebS cat ss.txt.bz2  
h91AYAY<+----->  
owSSse<[1] Jeba@jeba-VirtualBox:~/JebS> gzip dd.txt  
JebS>ls  
dd.txt.gz  
ba@jeba-VirtualBox:~/JebS> cat dd.txt.gz  
dd.txt>decompress<+----->KZlcba@jeba-VirtualBox:~/JebS>
```

```
jeba@jeba-VirtualBox:~/jeb$ ls  
aa.txt.gz  ss.txt.bz2  
jeba@jeba-VirtualBox:~/jeb$ cat >aa.txt  
Hello World  
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt  
This is Linux^C  
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt  
1a  
hello world.  
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt  
This is Linux  
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt  
2a  
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  
t  
t  
i  
c  
jeba@jeba-VirtualBox:~/jeb$ cat >hi1.txt  
ello  
ello  
ello  
ello  
c  
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hi1.txt >sam.patch  
jeba@jeba-VirtualBox:~/jeb$ patch ,sam.patch  
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch  
atching file hi.txt  
jeba@jeba-VirtualBox:~/jeb$ cat sam.patch  
--- hi.txt      2020-01-08 22:14:55.463569834 +0530  
+++ hi1.txt    2020-01-08 22:15:16.259898738 +0530  
@@ -1,3 +1,3 @@  
hi  
hi  
jeba@jeba-VirtualBox:~/jeb$ Scanned with  
jeba@jeba-VirtualBox:~/jeb$ CamScanner  
jeba@jeba-VirtualBox:~/jeb$
```



```
jeba@jeba-VirtualBox: ~  
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:~$ █ 786 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           LOGIN@   IDLE   JCPU   PCPU 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
```

User Environment.

a) Which account you are logged in? How do I log out?

Ans: whoami & who am i.

b) Display /etc/shadow file using cat command and understand the importance of shadow file. How its different from passwd file.

Ans: cat /etc/shadow

As with 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 lower case.
- An "x" in the ~~passwd~~ field. Passwords are stored in the "~~/etc/shadow~~" file.
- Numeric user id. This is assigned by adduser script. Unix uses the field plus the following group field to identify which file belongs to the user.
- Numeric group id. Red Hat uses group id's in a fairly unique manner for enhanced file security. Usually the group id will match the user id.

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full name of user. I'm not sure what maximum length for this field is but try to keep it reasonable (30 characters)  
User home directory, usually /home/username (e.g. /home/smith) All users personal file, web pages, mail forwarding etc will be stored.  
User shell account often set to "/bin/bash" provide access to the bash shell (my personal favorite shell)

) Set your current working directory.

→ pwd

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

o: History

) Create alias to most commonly used commands  
alias commands instruct the shell to replace one string with another string while executing the commands.  
- alias label = "command"

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] password for jeba:
root::18248:0:99999:7:::
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: ~
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    ttty1      2020-01-15 20:30
jeba@jeba-VirtualBox:~$ █
```

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x: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
uuclp: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
```

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```
● ● ● 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:~$ █
```

## scrolling

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

b) learn all essential commands like search/replace, highlight, show line numbers.

## Replace

→ syntax : /g/word to be replaced/s//new word/ge

Key	Action
b	Moves back to the beginning of the word
e	Moves forward to the end of the word
w	Moves forward to the beginning of the word
0(zero)	Move to first character of a line
\$	Move to the end of line

Key	Action
k	Moves cursor up
j	Moves cursor down
h	Moves cursor left
l	Moves cursor right

Key	Action
Ctrl+f	Scrolls forward
Ctrl+b	Scrolls backward
Ctrl+d	Scrolls half page
Ctrl+u	Scrolls half page backward

### Linux Editor

Q) Create, navigate and modify a file in editor.

i) creating a file

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

ii) Modifying the filename

To modify a filename on the vi editor type 'o'.

iii) Search in a file:

To find a word [forward search] press / followed by the word search

iv) Navigate

movement in four directions

key action

k moves cursor up

j moves cursor down

h moves cursor left

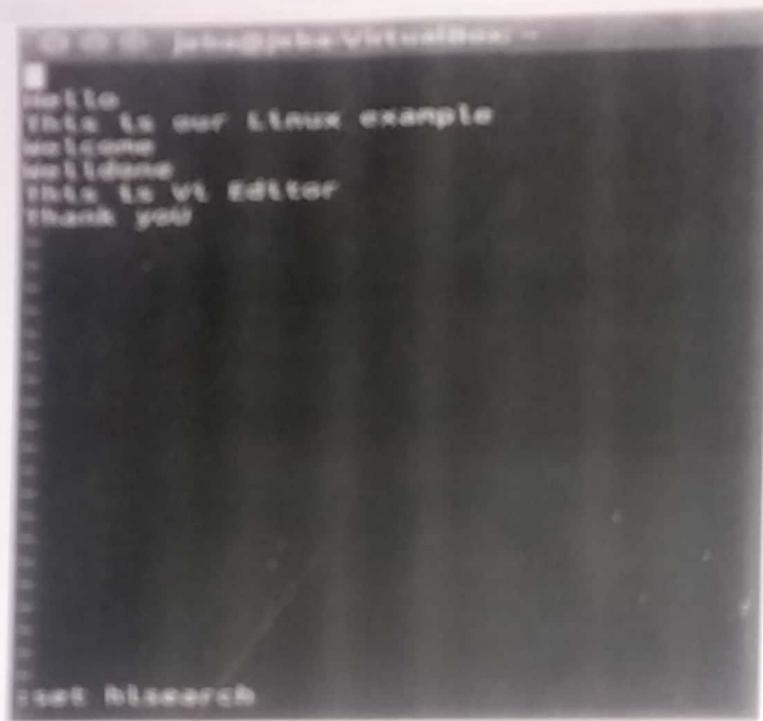
l moves cursor right.

highlight +

use set highlight

show the file together

use set nu



```
hello
this is our Linux example
welcome
congratulations
this is vi editor
thank you
```

Show the file number

Use set nu



```
hello
this is our Linux example
welcome
congratulations
this is vi editor
thank you
```

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

```
JeBa@JeBa-VirtualBox: ~
Hello
This is my Linux example
Welcome
Well done
This is Vi Editor
Thank you

replace with our (y/n/a/q/t/^E/^Y) n
```

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

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

## Practical no.9

### Network editing

- 1) Get work IP address of your machine using ifconfig?

```
jeba@jeba-VirtualBox: ~
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 host name of your machine?

Machine

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

c) Using ping to check the network connectivity to remote machine?

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Use ping to check the network connectivity to remote machines

```
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=
98.9 ms
^Z
[1]+ Stopped                  ping www.google.com
jeba@jeba-VirtualBox:~$
```

d) use of dig command

```
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:~$
```

# Troubleshooting network using traceroute, route command

```
jeba@jeba-VirtualBox:~$ netstat -an
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
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/notify
unix  3      [ ]        STREAM   CONNECTED  44642  @/tmp/dbus-CymTeI7AQG
unix  3      [ ]        STREAM   CONNECTED  43331  @/tmp/dbus-CymTeI7AQG
unix  3      [ ]        STREAM   CONNECTED  42988  @/tmp/dbus-CMGGc6G7PS
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/
stdout
unix  3      [ ]        STREAM   CONNECTED  43013  /run/systemd/journal/
unix  3      [ ]        STREAM   CONNECTED  42935
```

e) Use of arp command.

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
3
```

g) Use of host command

h) Use of host command

## USE OF HOST COMMAND

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

b) Use net stat command and Nmap 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
Map done: 1 IP address (1 host up) scanned in 20.32 seconds
jeba@jeba-VirtualBox:~$
```

Use of dig command

```
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: 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:~$
```

Troubleshooting network using traceroute, route command

*DR 06/02*

```
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:~$
```

## Practical no.8

Linux security:-

- ▷ Use of sudo to change user privilege to root + create a 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 give some user root privilege edit /etc/sudoers using vi Sudo, Enter new line highlighted below.

Validity expiration date for new user using password ageing.

```
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
```

3) Identify operation that require sudo privileges

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

4) Identify expression done over new using passwd again.

```
# 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.
```

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## 5) 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
```

```
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
```

## Practical 10

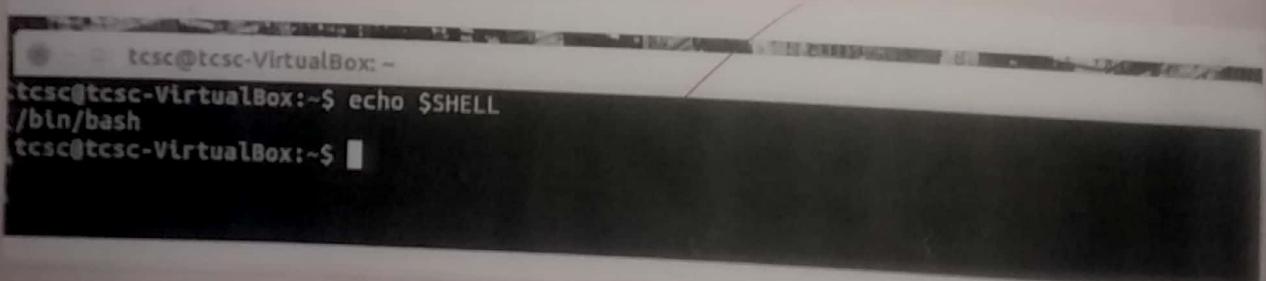
c) Delete newly added user.

Aim: SHELL SCRIPTING.

Basic 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 .

echo \$SHELL



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

→ Vi filename.sh  
#!/bin/bash  
echo "This is Linux"

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

"linux.sh" [New File]

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

```
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:~$
```

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 the script]
- e) chmod 777 filename.sh (Running the script)

program to display your name

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

```
echo "Enter your name:"
```

```
read name
```

```
echo "My name is: $name"
```

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

```
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:~$
```

Program to bind 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:~$
```

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

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

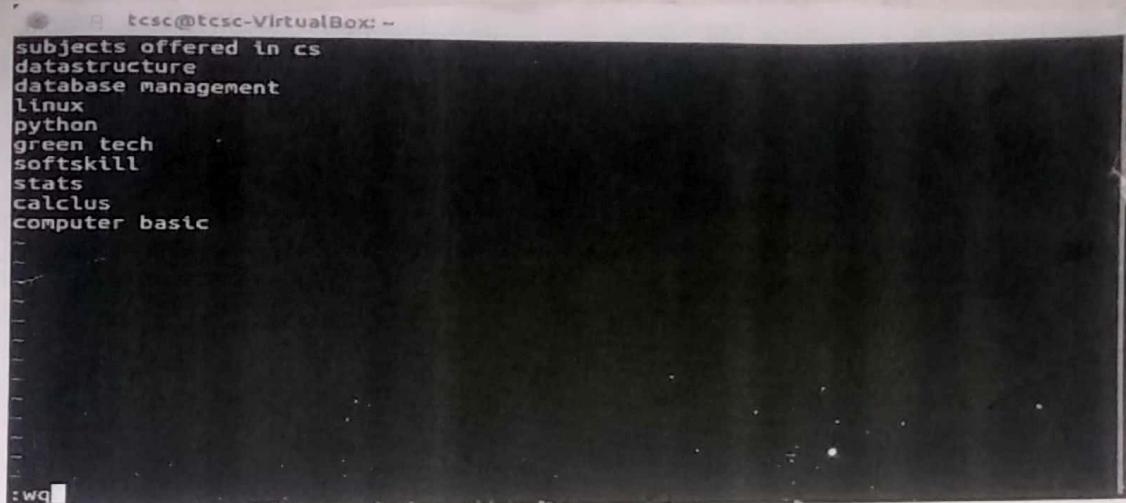
```
tcsc@tcsc-VirtualBox:~$ vi lin.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh
tcsc@tcsc-VirtualBox:~$ ./lin.sh 50 70
sum is:120
tcsc@tcsc-VirtualBox:~$
```

## Sed

Sed command or stream editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, find and replace but it can perform other text manipulation like insertion, deletion, search etc.

consider the following text file.

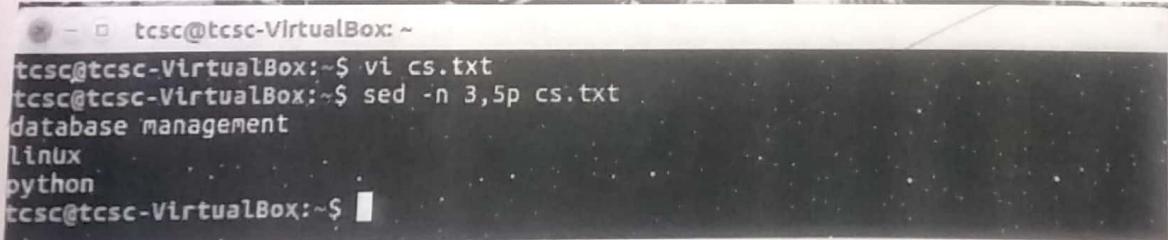
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```
tcsc@tcsc-VirtualBox: ~
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
```

1) Displaying partial text of a file:

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



```
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:~$
```

2) Display all except some lines:

To display all content of a file except from some position, 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) Delete a line:

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

```
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:~$
```

4) Search and replacing a string.

(S) option for searching a word.

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

6) Add a new entry / before the matched string.  
To add a new line with some content after  
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
calculus
computer basic
tcsc@tcsc-VirtualBox:~$
```

To add a new line with some content before  
every pattern match, use option 'i'

```
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
```

To change a whole line with matched pattern.

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To change a whole line to a new line when a search pattern 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
calclus
computer basic
```

### (8) Appending lines:-

To add some content before every line with sed, use  $\star$  and as follows.

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

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