

Practical No. 1 [Linux Practical] [SEM-II]

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Aim :- Install your choice of Linux Distribution for e.g:-
Ubuntu , fedora , Debian , etc.

Ubuntu :- Ubuntu is a free and open source software based on debian . Ubuntu is officially released under 3 editions. They are : 1) Desktop , 2) Server , 3) Union.

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

Steps for installing Ubuntu in a Virtual Machine :-

Step 1:- Select a virtual optical file on a physical drive to start Ubuntu in your virtual Machine . Space given to it is 1.86 GB

Step 2:- Select the language of your choice and click on 'Install Ubuntu'. (You can also 'Try Ubuntu' for free on computer device from this co.)

Step 3:- In 'Updates and Add software' click on the normal installation.

Step 4:- While configuring initialization type, we need to click 'Create Disk and Install Ubuntu'. This step would delete all types of document , photos ,etc in all operating

Step 5:- In this you only need to choose the location for the check to work on Ubuntu.

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

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

Step 8:- Type none of virtual disc and recommended to be given is 2048 GB or 2TB

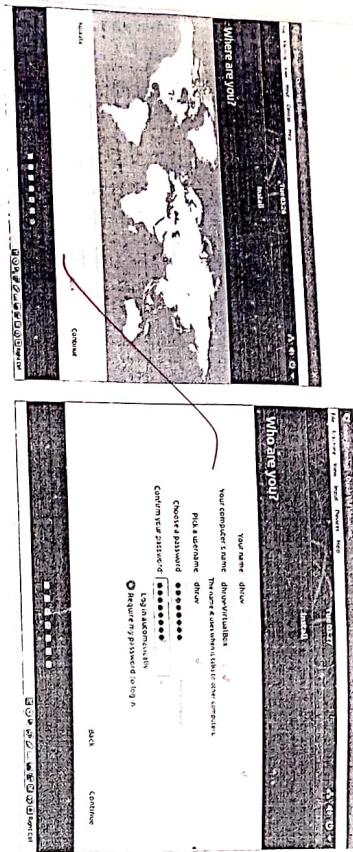
Hence, Now the VirtualBox is ready to use.

8) Customize Desktop environment by changing different default options like changing default background, themes, screensavers, etc.

Accessing Appearance Settings:-

1) 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.

2) 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 Background part, you can see
your current wallpaper.

- 1) On the right side is post where we can select one of ubuntu wallpapers. Clicking on every thumbnail our wallpaper will be changed right away with a feeling effect.
- 2) If you want to select wallpaper then click the drop down menu above thumbnails and select the pictures.

- 3) You will see all the pictures in your Picture folder as thumbnails, where you can select them as your wallpaper.

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

- 4) Changing Ubuntu Theme :-
Ubuntu also has an option to change the desktop theme, which in one click will change the entire way your computer looks.
- 5) To do that; click on the drop-down menu below to

To do that; click on the drop-down menu below to choose between Ambience, Radiance on High Contrast.

3) Ambiance is a light theme that looks a bit more Mac-like, while Radiance is the darker brown theme used in Ubuntu by default.

4) Screen Resolutions : Assertion: the current screen resolution for your desktop.

change the size or rotation of the screen :

1.) You can change how big (or how detailed) things appears on the screen by changing the screen resolution.

2.) You can change which way up things appear (for example, if you have a rotating display) by changing the rotation.

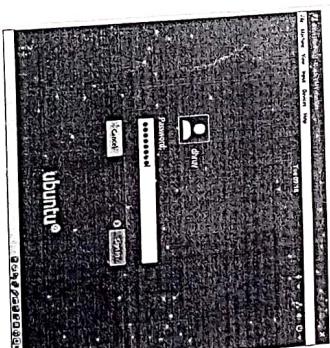
3.) Click the icon on the very right of the menu bar and select system settings. Open screen display.

4.) If you have multiple displays and they are not mirrored. You can have different settings on each display, select a display in the preview area.

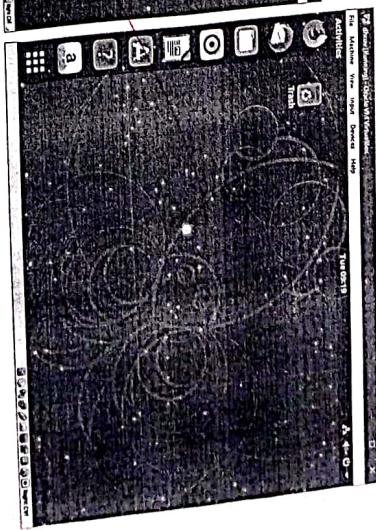
5.) Select your desired resolution and rotation.

6.) Select apply. The new settings will be applied after 30 seconds before reverting back. That's why, if you cannot see anything with the new.

Step 7

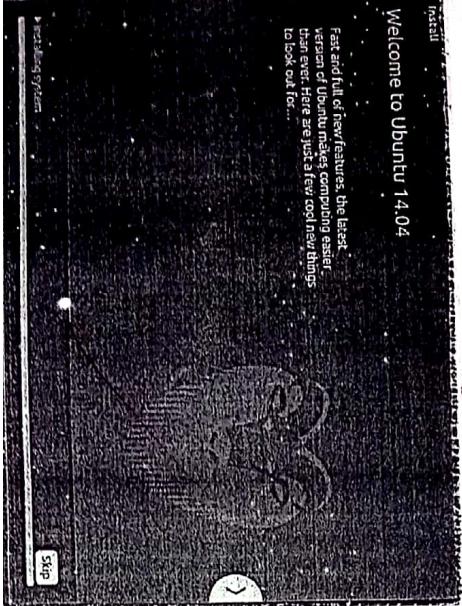


Step 8



Time setting:- Change the time zone of your system to (or New York Time).

- 1.) If you are currently in Indian time. How does the displayed time change?
- 2.) After noting the time change. Change the time zone back to your local time zone.
- 3.) Just click on the clock on the top bar. and choose time and date setting, once the time and Date window opens. choose manually, so you can change the time and date manually; otherwise choose your time zone from the map and choose automatic.



Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...

Welcome to Ubuntu 14.04
Install
Skip

Aim :- Installing and Removing Software.

a) Install gcc package, verify that it runs and 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 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++ programming language.

Now To UNIVERSAL Gcc COMPILER :-

In Gcc 5.1.0, although there is no to p-test 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 executable like gcc, g++, cpp..... contained in that directory.

PRACTICAL No. 3.

Aim :- Utilization of grep, man command.

Documentation :

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

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

We are going to find the info about the 'grep' 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) and (backspace = down) keys.

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

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

Ans 8 To use the 'man' command simply type 'man Command-name'.

Now we are going to find the manual for 'ls' command simply type:

- c.) Finding man pages by topic what man pages are available that document file compressor.

Ans: 'tar', 'zip' are some man pages which are available for document file compression simple type : 'man zip', 'man tar'.

- d.) Finding man pages by section from the cmdline using the man name for the printlib function which

PRACTICAL No. 4.

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Aim :- Command Line Operations.

- 1.) Install 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/nss-ldap-253/pam /passwd
• /usr/bin/passwd
• /etc/pam.d/passwd
• /etc/passwd
- 4.) Find the directory passwd file under one level down.
→ # find / -maxdepth 2 -name passwd
• /etc/passwd
- 5.) Find the passwd file under root and 2 level down.
→ # find / -maxdepth 3 -name passwd
• /usr/bin/passwd
• /usr/pam.d/passwd
• /etc/passwd
- 6.) Find the password file below sub-directories level 2 and 4.
→ # find -maxdepth 3 -maxdepth -name passwd
• /user/bin/passwd
• /etc/pam.d/passwd

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

→ # ln -s file1 file2

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

→ # touch example.txt

mv example.txt /tmp

9) Delete the file moved to /tmp in previous step by absolute method.

→ # rm /tmp/example.txt

10) Find the location of ls, ps, bash commands.

→ # whereis ls

ls : /bin/ls /usr/share/man/man1/ls/g2

whereis ps

ps : /bin/ps /usr/share/man/man1/ps/g2

/usr/share/man/man1/ps/g2

whereis bash

bash : /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.g2

QF

PRACTICAL NO. 5

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Aim :- File operations.

1) Explore mounted file system on your computer.

Filesystem	1k-blocks	Used	Available	use%	Mounted on
udev	494436	0	494436	0%	/dev
tmpfs	102416	3676	98740	4%	/run
/dev/sda1	709278	3383372	3326024	51%	/
tmpfs	512076	216	5116	1%	/dev/shm

2) What are the different ways of exploring mounted file system on Linux?
→ mount.

3.) Copying text from files.
→ cp command, mv command.

```
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz ss.txt.bzz
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
1c1
< Hello world
> hello world
<-
> this is Linux
jeba@jeba-VirtualBox:~/jeb$ gzip aa.txt
jeba@jeba-VirtualBox:~/jeb$ gzip bb.txt
Binary files aa.txt.gz and bb.txt.gz differ
```

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

→ gzip filename.txt

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

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

→ cat > filename.txt
 cat > filename.txt
 diff -u filename.txt filenames.txt > sam.patch
 patch , sam.patch ..
 patch < sam.patch

```
jeba@jeba-VirtualBox:~/JebS cat >hi.txt
hi
hi
^C
jeba@jeba-VirtualBox:~/JebS cat >hi1.txt
Hello
Hello
Hello
Hello
^C
jeba@jeba-VirtualBox:~/JebS diff -u hi.txt hi1.txt >sam.patch
jeba@jeba-VirtualBox:~/JebS patch <sam.patch
jeba@jeba-VirtualBox:~/JebS patch <sam.patch
patching file hi.txt
jeba@jeba-VirtualBox:~/JebS cat sam.patch
patching file hi1.txt
2020-01-08 22:14:55.46356934 +0530
+++ hi1.txt 2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+Hello
+Hello
+Hello
jeba@jeba-VirtualBox:~/JebS
```

```
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  8.195 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           20:32 4:44  8.67s 0.33s /sbin/upstart -
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
[jsudo] 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:::
```

- 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 character, and one as follows:-
 Username, upto 8 characters, case-sensitive, usually all lowercase.

- An "x" in the password field. Passwords are stored in the "/etc/shadow" file.
- Numeric user id. Red Hat users group id's in a fairly unique manner for enhanced file security. Usually the group id will match the user id.
- Full name of user. I'm not sure what the maximum length for this field is, but try to keep it reasonable (under 30 characters).
- User's home directory. Usually /home/username (eg /home/smith). All user's personal files, web pages, mail forwarding, etc. will be stored here.
- User's "shell-account". Often set to "/bin/bash" to provide access to the bash shell (my personal favourite shell).

- 3) Get your current working directory.
 \Rightarrow pwd.

```
jeba@jeba-VirtualBox:~$ history
1 whoami
2 whoami
3 whoami
4 clear
5 whoami
6 whoami
7 whoami
8 whoami
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:~$ 13
Login: tty1
2020-01-15 20:30
jeba@jeba-VirtualBox:~$ █
```

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

4.) Explore different ways of getting command history, how to run previously executed command without typing it.
 ⇒ history ! Line number.

5.) Create alias to most commonly used commands → Alias commands inasmuch the shell to replace one string with another string while executing the command.
~~alias = "command".~~

J

Aim :- vi (Linux Editor)

i.) 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 and its extension.

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 / followed by the word to search.

v.) Navigate :-
 → Movement in four directions.

<u>Key</u>	<u>Action</u>
k	Move cursor up.
j	Move cursor down.
h	Move cursor left.
l	Move cursor right.

Word Navigation

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

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

Scolling :-

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

:set nu

- 1) Learn all essential commands like search / replace , show line numbers.
- 1) Replace .
 2) Highlight
 use set isearch .
- 3) show the line number
 use set nu

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

Jeba

PRACTICAL No. 8.

Aim:- Linux Security.

- 1) Use of sudo to change user privileges to root.
→ Create an user named user1:
→ To give some users root privileges edit /etc/sudoers file using visudo. Enter new line as highlighted below.
- 2) Identify operators that require sudo privileges.

4.) Delete newly added user.
→ Sudo userdel user1.

x -○ 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=
10.9 ms
Z
1]+ Stopped
eba@jeba-VirtualBox:~$ █
ping www.google.com
```

```
jeba@jeba-VirtualBox:~$ dig www.google.com
```

```
; <>> DIG 9.10.3-P4-Ubuntu <>> www.google.com
; global options: +cmd
; Got answer:
;->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52068
; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; QUESTION SECTION:
; www.google.com.

; ANSWER SECTION:
www.google.com. 91 IN A 172.217.166.100
; Query time: 152 msec
; SERVER: 127.0.1.1#53(127.0.1.1)
; WHEN: Mon Jan 20 22:40:06 IST 2020
; MSG SIZE rcvd: 59
```

```
jeba@jeba-VirtualBox:~$ █
```

```
②③④ 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:~$ host 192.168.1.1  
host 9.10.3-p4-Ubuntu  
jeba@jeba-VirtualBox:~$
```

8) Use of netstat command and Nmap command.

→ netstat

nmap www.google.com

Proto	Refcnt	Flags	Local Address	Foreign Address	State
dgram	2	[]	DGRAM	I-Node 42149	Path /run/user/1000/system
dgram	2	[]	DGRAM	9694	/run/systemd/journal/
dgram	16	[]	DGRAM	9695	/run/systemd/journal/
dgram	7	[]	DGRAM	9704	/run/systemd/journal/
dgram	3	[]	DGRAM	9684	/run/systemd/notify
stream	3	[]	CONNECTED	44012	@/tmp/dabs-Cymie7A0C
stream	3	[]	CONNECTED	43332	@/tmp/db5-Cymie7A0C
stream	3	[]	CONNECTED	42988	@/tmp/abs-CyGCGC7P5
stream	3	[]	CONNECTED	42989	/run/systemd/journal/
stream	3	[]	CONNECTED	13242	/run/systemd/journal/
stream	3	[]	CONNECTED	43113	/run/systemd/journal/
stream	3	[]	CONNECTED	42013	/run/systemd/journal/
stream	3	[]	CONNECTED	42035	/run/systemd/journal/

```
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): 2404:6500:4007:811::2004
rDNS record for 216.58.196.68: bon05s11-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:~$
```

```
#!/bin/bash  
echo "THIS IS LINUX!"
```

```
linux.sh [New File]
```

```
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 favourite editor, to edit the script]

e) Chmod 777 filename.sh (for making the script executable)
f) sh filename.sh or ./filename.sh (for running the script)

* Program to display your name.

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

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

```
tcs@tcs-VirtualBox:~$ echo Enter your name:
echo "my name is: Sname"
tcs@tcs-VirtualBox:~$
```

tscs@tscs-VirtualBox:

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

"lin.sh" 3 lines, 46 characters

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 the following text file.

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'.

subjects offered in computer

datastructure ..

database management

linux

python

green tech

softskill

stats

Calclus

computer basic

fcsc@fcsc-VirtualBox:~\$ sed -e s/cs/computer system / cs.txt

Subjects offered in cs

datastructure

database management

linux

python

green tech

softskill

stats

calclus

computer basic

- 6.) Add a line after / before the matched string.
- To add a new line with some content 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'.

8.) Appending lines

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

```
tcs@tcs-VirtualBox:~$ sed '/cs/a "this is Linux"' cs.txt
subjects offered in cs
"this is Linux"
database management
Linux
green tech
softskill
stats
calculus
computer basic
tcs@tcs-VirtualBox:~$
```

```
tcs@tcs-VirtualBox:~$ sed '/Linux/c "this is Linux"' cs.txt
subjects offered in cs
"this is Linux"
database management
Linux
green tech
softskill
stats
calculus
computer basic
tcs@tcs-VirtualBox:~$
```

17/10/21