1. Linux Installation

1. Install your choice of linux distribution eg ubuntu, Fedora, Debian using a USB drive.

- Most newer computers can boot from USB. you should see a welcome screen prompting you to choose your language and giving you the option to install ubuntu or try it from the USB.

- If your computer doesn't automatically do so, might need to press the F12 key to bring up the boot menu, but be careful not to hold it down that can cause an error message.

1. Prepare to install Ubuntu.

- We recommend you plug your computer unto a power source.

- You should also make sure you have enough space on you PC to install ubuntu.

- We advice you to select download updates while installing and install third-party software now.

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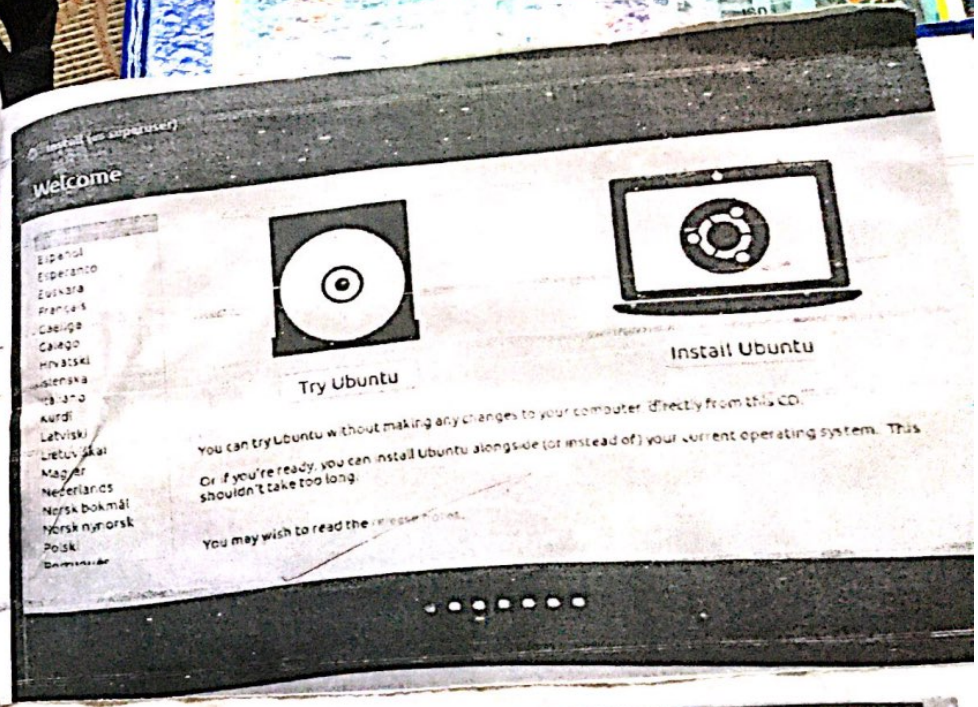
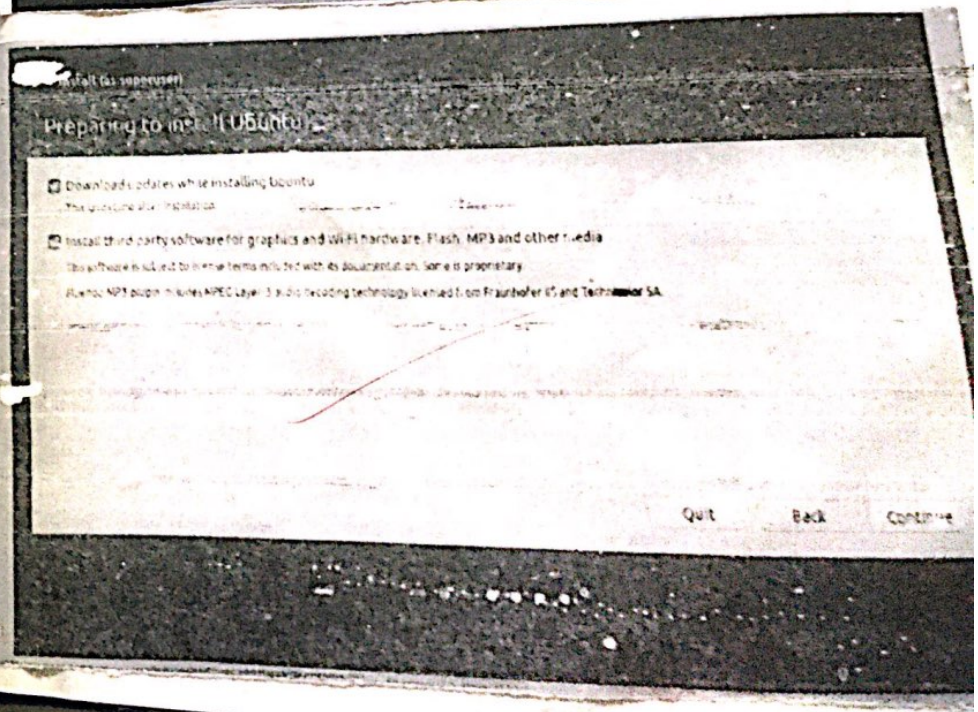
- you should also stay connected to the internet so you can get the latest updates while you install ubuntu.
- If you are not connected to the internet you will be asked to select wireless network, if available, we advise you to connect during the installation so we can ensure your machine is up to date

2. Allocate drive space.

- use the checkboxes to choose whether you had like to 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' op





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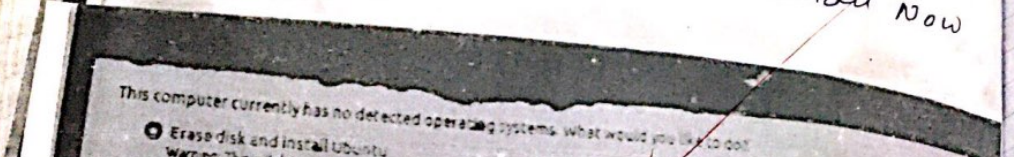
· Begin the installation.

Depending on your previous selections, you can now verify that you have chosen the way in which you would like to install ubuntu.

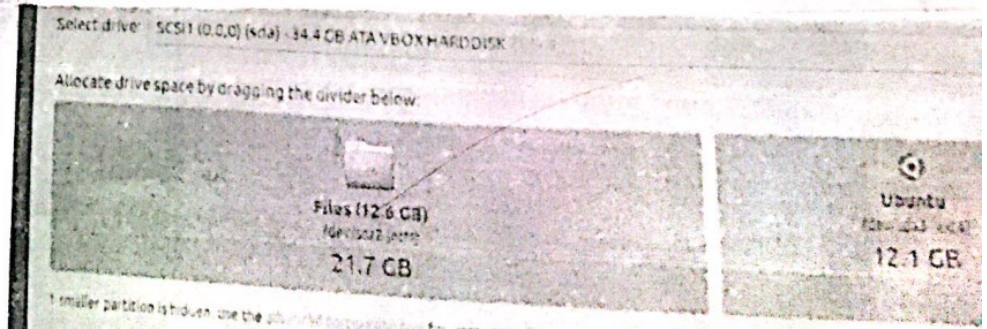
· the installation process will begin when you click the install Now button.



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

· TIP: If you having problems connecting to the internet, use the menu in the top right hand corner to select a network.



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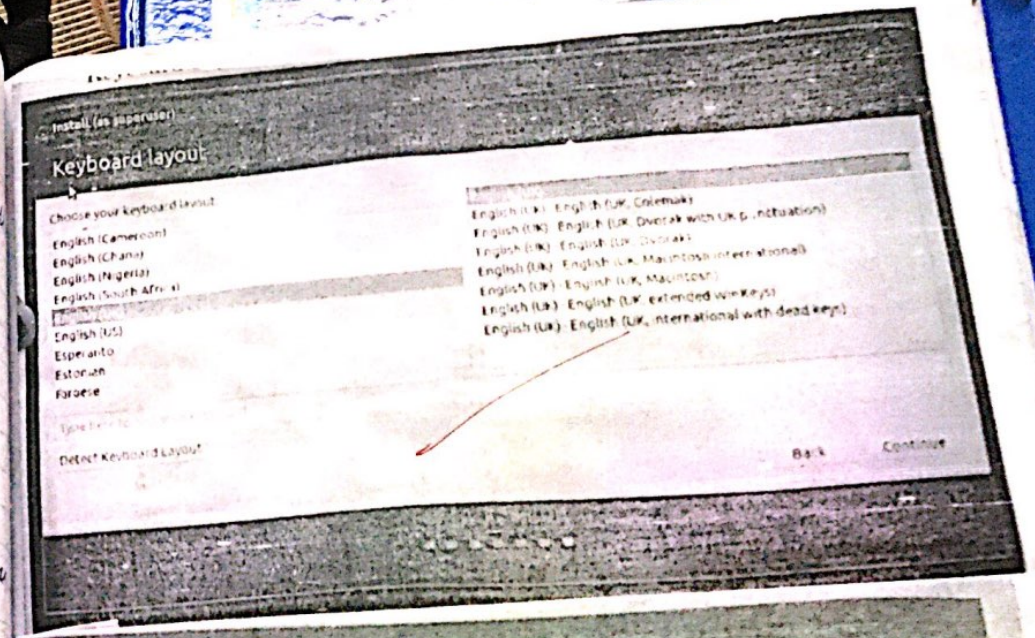
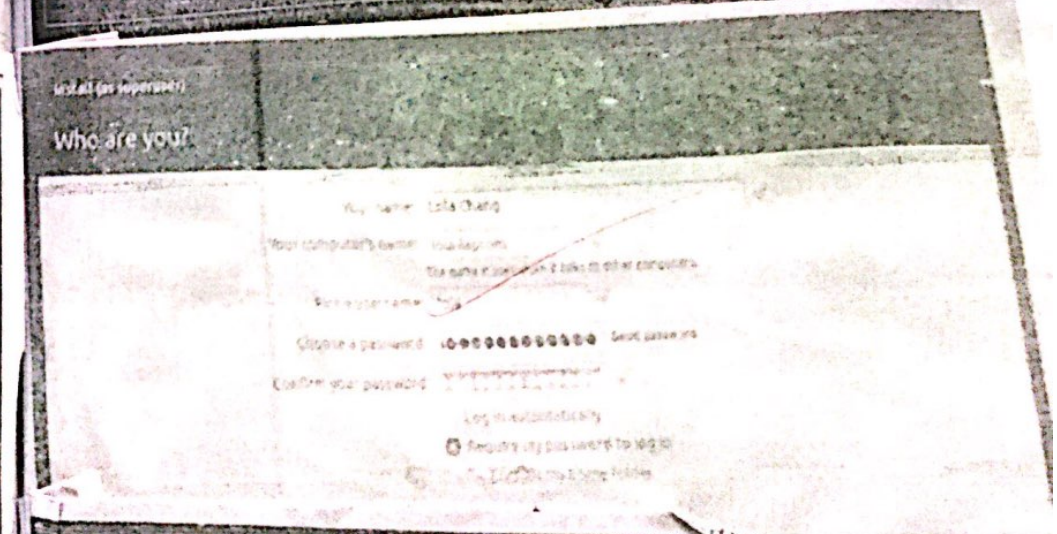
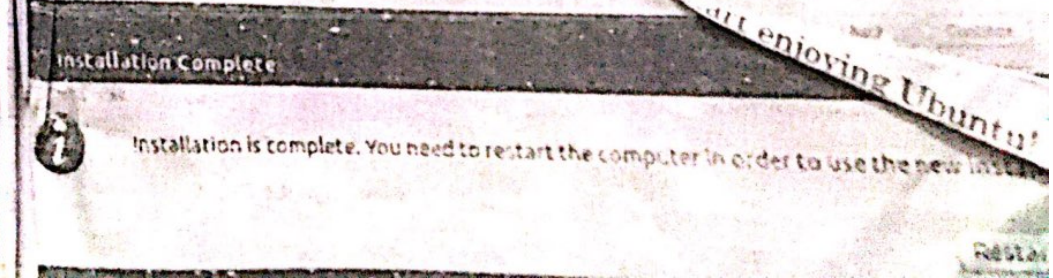
5. Select your preferred keyword layout click on the language option you need. If you're not sure click the 'Detect keyword layout' button for help.

6. Enter your login and passd details

7. ~~learn more~~ learn more about ubuntu while the system installs.







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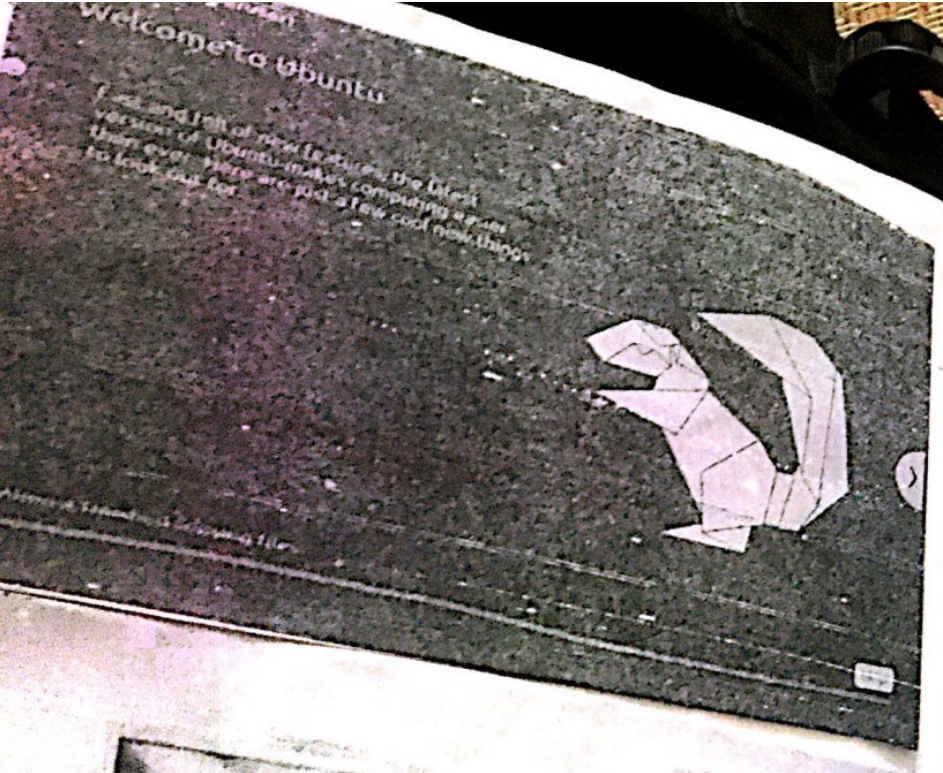

Prac : 02

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 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.

Step3 : Type 'sudo apt-install build-essential'. This will install all the libraries reqd for c and c++ programming language.

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NOW TO UNINSTALL GCC COMPILER :

In gcc 5.1.0, although there is no top level uninstall target in directories do have it, in particular, so you can do.

type: cd build/gcc
sudo make uninstall.

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

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AIM: Utilization of grep, man commands Documentation

① 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.

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Another more summerized form showing info is the 'man' command of the command is same as 'info' but req^d data

b). Finding man pages from the cmd line
bring up the man page for the 'ls' command. Scroll down to the examples section.

→ To use the 'man' command simply typ '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.

) 'Tar', 'zip' are some man pages which are available for document file compression.

Name → zip - package and compress (archieve) files
synopsis → zip [ok] (see seperate man page)
zipnote (" " " ")
zipsplit (" " " ")

use → ① add → update existing entries and add compress (archieve) files. If does not exist issue warning then create if then create a new archieve.

② freshen (-f) → update existing entries of an archive if newer in the file system this not add new files to the archives

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⊖ output - Name → ls - list directory contents
Synopsis → ls [OPTION]... [FILE]...
Description -
- a, - all
- A, - almost-all
do not list implied and
- b -- escape
print (- style escapes for nongraphic characters)
- c list entries by columns
- d, -- directory
list directories themselves, not their cont

⊖ delete (-d) → Select entries in an existing archive and delete them

⊖ copy (-U) - Select entries in an existing archive and copy them to a new archive.

d) Finding main pages by section from the end
write up the main page for the print
up 'gu' which manual page section
are library functions found?

→ The number corresponds to what section of the manual page is from, 1 is use command, while 2 is sys and the stuff. the man page for man itself explains it and lists the output for man itself explains it and lists the id output for. list

MANUAL SECTIONS
The standards sections of the manual include
1. User commands ( )
2. system calls
3. library functions
4. Devices and special files
5. file formats and documentations
6. games et al.
7. miscellania
8. System Administration tools and daemons

distributions customize the manual sections to their specific which include additional sections

There are certain terms that have pages in different sections. (eg: printf as a command appears in section 1 and as a stdio.h function appears in section 3) in cases like that man before the page name to choose which one you want or use man -a to show every matching page in a row

$ man 1 printf
$ man 3 printf
$ man -a printf
$ man -k printf

printf (1) - format and print data
printf (1p) - write formatted output
" (3) - formatted output conversion
" (3p) - print format output
printf (1a [tru]) (1) - bash builtin commands
-su (bash 1)

you can tell what section a term falls in with man -k (equivalent to apropos command) It will also substring matches too. so you need to use "form to [illegible]

c) command can help list the available options for the mkdir command. How can you do this?

$ mkdir - m dez mix directory

PRACTICAL :04

AIM: To study command line operation

a) Install new package

sudo apt-get install [package name]

b) Remove the installed package

sudo apt-get remove [package name]

c) Find passwd file in / using find command

Find / name passwd

- usr / share / doc / All - / dop 45 / Pathfind / pass
- /usr / bin / passwd
- etc / pam.d / passwd
- /etc / passwd

d) find the directory passwd file under root as link drawn.

find / -max depth 2 -name passwd

- /etc / passwd.

find the passwd file under root and 2 lvl in it

find / -max (length) -name passwd

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

find the passwd file 2/w und-derivative level and 4

find maxdepth - 3 - max depth - name passwd

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

e) create a symbolic link to the file found in part one

ln -s file / file L

f) create an empty file example.txt and move it to / tmp directory using relative path.

touch exam ple.txt.

mv example.txt /tmp

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

rm / tmp / example.txt

Q:-

11) - find the location of ls, ps and bash commands

where ls

ls / bin / usr / share / man / man1

ls / bin / usr / share / man / man1

where ps

ps / bin / usr / share / man / man1

ps / bin / usr / share / man / man1

where bash

bash / bin / usr / share / man / man1

bash / bin / usr / share / man / man1

Practical : 05

1. Explore mounted file systems on your computer

→ df -k

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

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

→ mount

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relative)
proc on /proc type proc (rw,nosuid,nodev,noexec,relative)
udev on /dev type devtmpfs (rw,nosuid,relative,size=494436k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relative,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relative,size=102416,mode=755)
/dev/sda1 on / type ext4 (rw,relative,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relative)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relative,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,relative,xattr,release
_agent=/lib/systemd/systemd-cgroups-agent,name=systemd,mrouter)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relative)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relative,cpuset,mrout
er)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relative,net
_cls,net_prio,mrouter)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relative,pids,mrouter)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relative,freezer,mro
uter)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relative,cpu,cpua
cct,mrouter)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relative,devices,mro
uter)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relative,memory,mrout
er)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relative,blkio,mrouter)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relative,perf_eve
nt,mrouter)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relative,hugetlb,mro
uter)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relative,fd=32,pgrp=1,timeout=0,mi
nproto=5,direct)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relative)
```

3. Copying text from files.

– cp command, mv command.

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

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

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

→ gzip filename.txt

bzip2 file name.txt

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY•[illegible]
```

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

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

07/02

Practical : 06

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

→ who command & whoami

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

Ans: who command & whoami

```
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                780 id=tty1
jeba@jeba-VirtualBox:~$
```

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

b) Display /etc/shadow file using cat command and understand the importance of shadow file

→ cat /etc/shadow.

As with the passwd file, each field in the shadow file is also seprated with ":" colons characters, and are as follows:

Practical: 07

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

i) Creating a file

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

ii) Modifying the file:

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

iii) Search in a file:

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

iv) Navigate :- movement in four directions.

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

WORD NAVIGATION :

KEY	ACTION
b	moves back to the beginning of the word.
e	moves forward to the end of the word
w	moves forward to the begining of the word
0(zero)	Move to first character of a line
$	Move to the end of line

SCROLLING :

KEY	ACTION
Ctrl + f	scrolls forward
+ b	scrolls backward
+ d	scrolls half page.
+ u	scrolls half page backward

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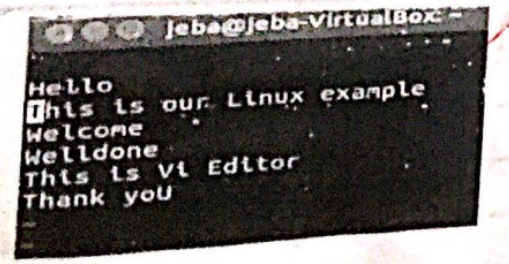
search essential commands like numbers / replace, highlight, show

Replace.

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

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

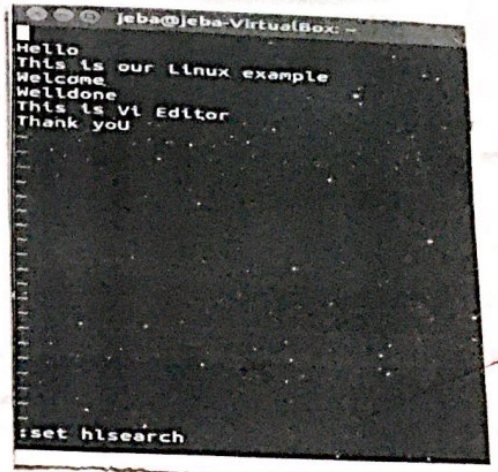


ii) **Highlight**

Use **set hlsearch**

(ii) Highlights

use set hlsearch.



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a) show the line number
use set nu.

Show the line number

Use set nu

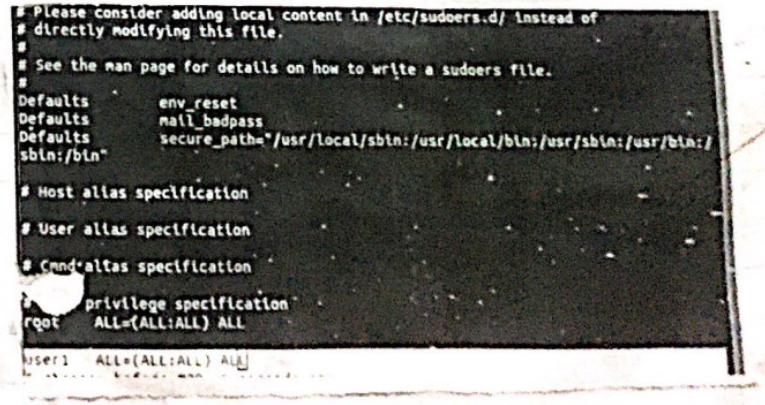
07/02

Practical 08

a) use of sudo to change user privilages to root.

Create an user named user1.

To give some users root privilages edit /etc/sudoers using visudo. enter machine as highlighted below.



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(b) Identify operations that require sudo privilidges.

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

c] ~~Identify operations that req sudo privilege~~

c] Modify expiration date for new user using password ageing.

odify expiration date for new user using password ageing.

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



```
jeba@jeba-VirtualBox:~$ sudo chage user1
Changing the aging information for user1
Enter the new value, or press ENTER for the default

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

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

E - Expiration date

-m - minimum number of days before password change

-M - No. of days password is valid.

-I - Account inactive.

-W - No. of days of warning before a password change is req.

d) Delete newly added user.

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


Practical : 09

Network Managment

a) Get IP address of your machine using ifconfig.

a) **Get 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 MB)  TX bytes:8518 (8.5 KB)

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

b) Get hostname of your machine

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

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c) use ping to check the network connectivity to remote machines

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

d] use of dig command.

d) 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:~$
```

e] Troubleshooting network using traceroute route command.

e) Troubleshooting network using traceroute, route command

```
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:~$ 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:~$
```

f) use of arp command.

f) Use of arp command

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ arp
Address                  HWtype  HWaddress           Flags Mask            Iface
10.0.2.2                 ether   52:54:00:12:35:02   C                     enp0s
3
```

g) use of host command

g) Use of host command

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

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h) Use of netstat command and Nmap command.

```
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/notify
unix  3      [ ]         STREAM     CONNECTED     44047    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     43331
unix  3      [ ]         STREAM     CONNECTED     42988    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     47698    @/tmp/dbus-CMGGc6G7P5
unix  3      [ ]         STREAM     CONNECTED     13242    /run/systemd/journal/
stdout
unix  3      [ ]         STREAM     CONNECTED     43113    /run/systemd/journal/
stdout
unix  3      [ ]         STREAM     CONNECTED     43013
unix  3      [ ]         STREAM     CONNECTED     42935
```

```
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:~$
```

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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) #!/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!"
```

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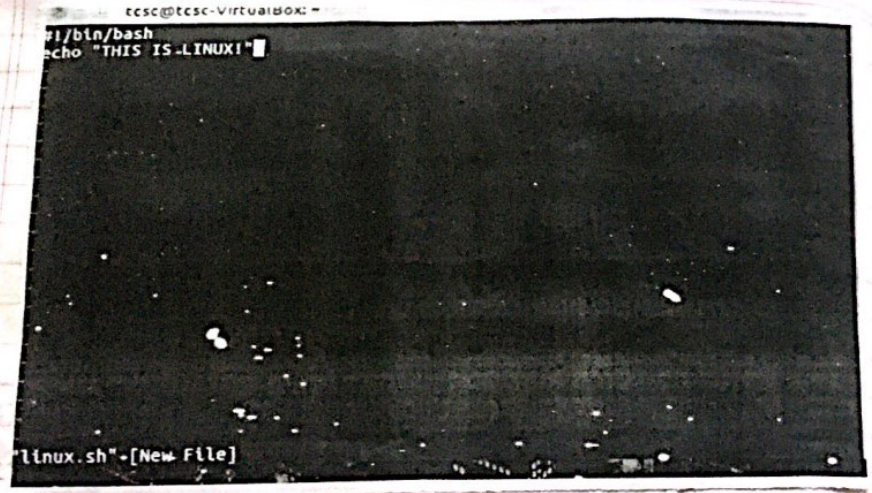
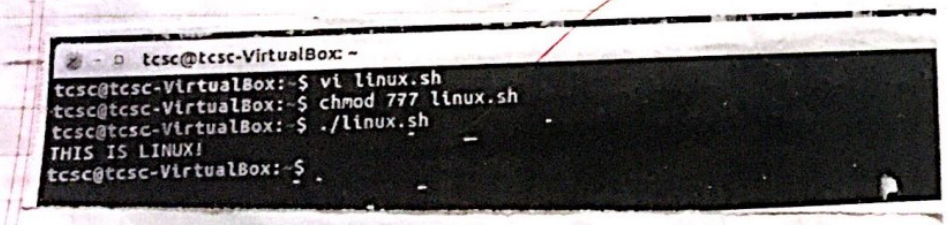


- Chmod 777 filename.sh
  ./ filename.sh



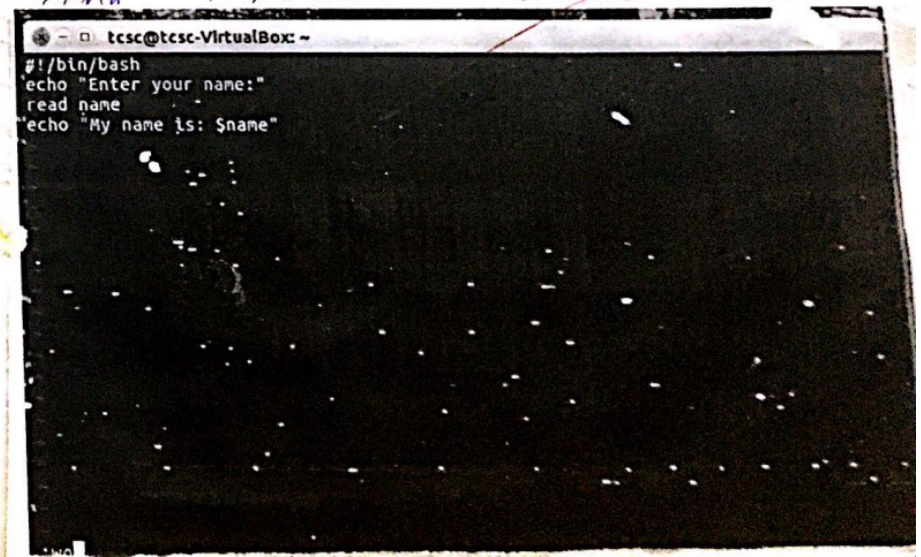
Steps to write and execute a shell script

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

PROGRAM TO DISPLAY YOUR NAME

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



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PROG TO FIND SUM OF 2 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 sum of two numbers

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

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

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 insertation, file etc. with sed we can edit complete files without actually have to open it.

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

```
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:~$
```

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 line

To display all content of a file except a line rather than seeing whole file

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

3) Deleting a line

To delete a line, use line no. 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 & Replacing a string

's' option is 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
calclus
computer basic
```

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5.] Replace a string on a particular line
To replace string on a particular line, use line no with 's' option.

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

6)

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

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


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

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

7) To change a whole line with matched pattern.
To change a whole line in 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
```

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18.

8) Appending lines

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

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

10/02

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