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### PRACTICAL NO.1

Aim:-

(1) Install your choice of Linux distribution, here in this case ~~Ubuntu~~ Ubuntu :-

Following are the steps for the installation of Ubuntu :-

Step 1 :- Download the ISO file for Ubuntu 64 bit from the official website of Ubuntu.

Step 2 :- Open any Virtual Box (as in this case we are doing virtual machine installation).

Step 3 :- Set all the configurations and create virtual hard disk in the step-by-step guided view of configuration settings.

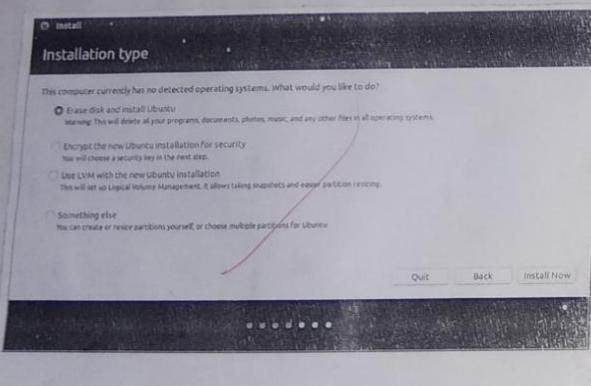
Step 4 :- Now a dialog box appears for start-up disk setting. Select the ISO file downloaded in Step 1 and click next.

Step 5 :- There will be two options showing on the screen viz. Try Ubuntu and Install Ubuntu. Click on Install Ubuntu.

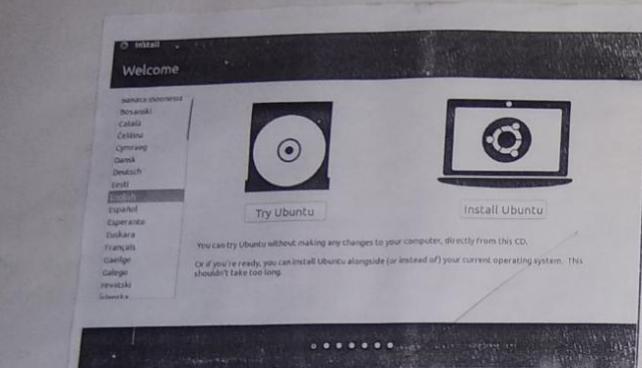
Step 6 :- Configure the system as per your convenience.

Step 7 :- Select the installation type.

Step 8 :- Log in as the user by filling all the information such as Username, computer name, password, etc. You're all done. The installation of Ubuntu 64 bit is completed.



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(b) Customize desktop environment by changing different default options like changing default background, themes, screensavers.

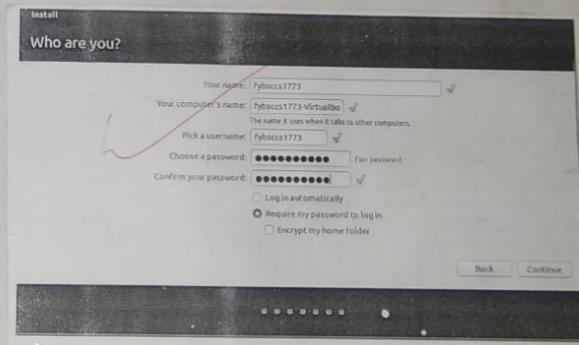
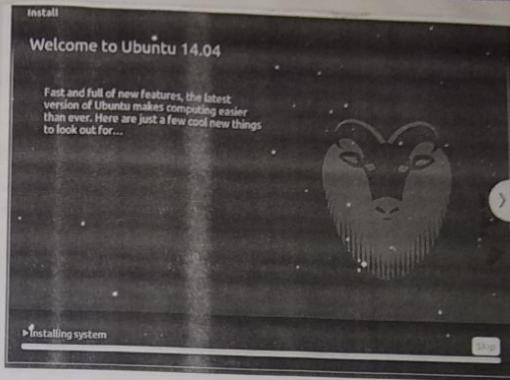
(i) Accessing Appearance Settings:

- 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 options icons. Let's first select the Appearance icon.

(ii) Changing Wallpaper picture:

- On the left side of Background part, you can see your current wallpaper.
- On the right side is part where we can select one of Ubuntu wallpapers. Click on any thumbnail our wallpaper will be changed right away, with a fading effect.
- If you want to select wallpaper from your Picture folder, click the dropdown menu above thumbnails and select the Pictures folder.
- You will see all the pictures in your Pictures 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 it.

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(ii) 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.
- To do that, click on the drop-down menu below the Wallpaper thumbnails, and choose between Ambiance, Radiance or High Contrast.
- Ambiance is a light theme that looks a bit more Mac-like, while Radiance is the darker ~~dark brown~~ theme used in Ubuntu by default.

(c) Screen Resolution: Ascertain the current screen resolution for your desktop.

Change the size or rotation of the screen.

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

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

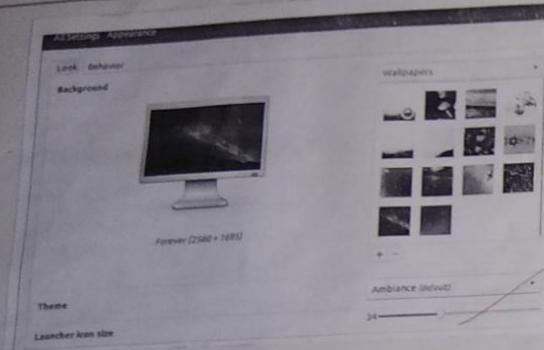
- Click the icon on the very right of the menu bar and select System Settings.

- Open Screen Display.

- 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.

- Select your desired resolution and rotation.

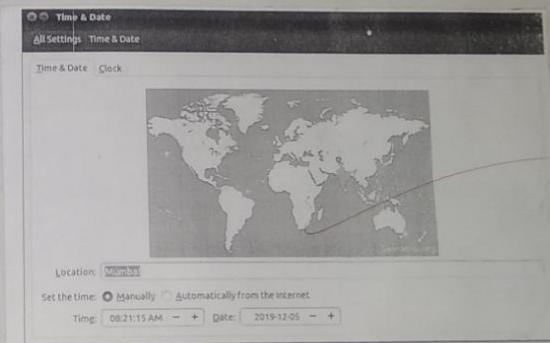
- Click Apply. The new settings will be applied for 30 seconds before reverting back. That way, if you cannot see anything with the new.



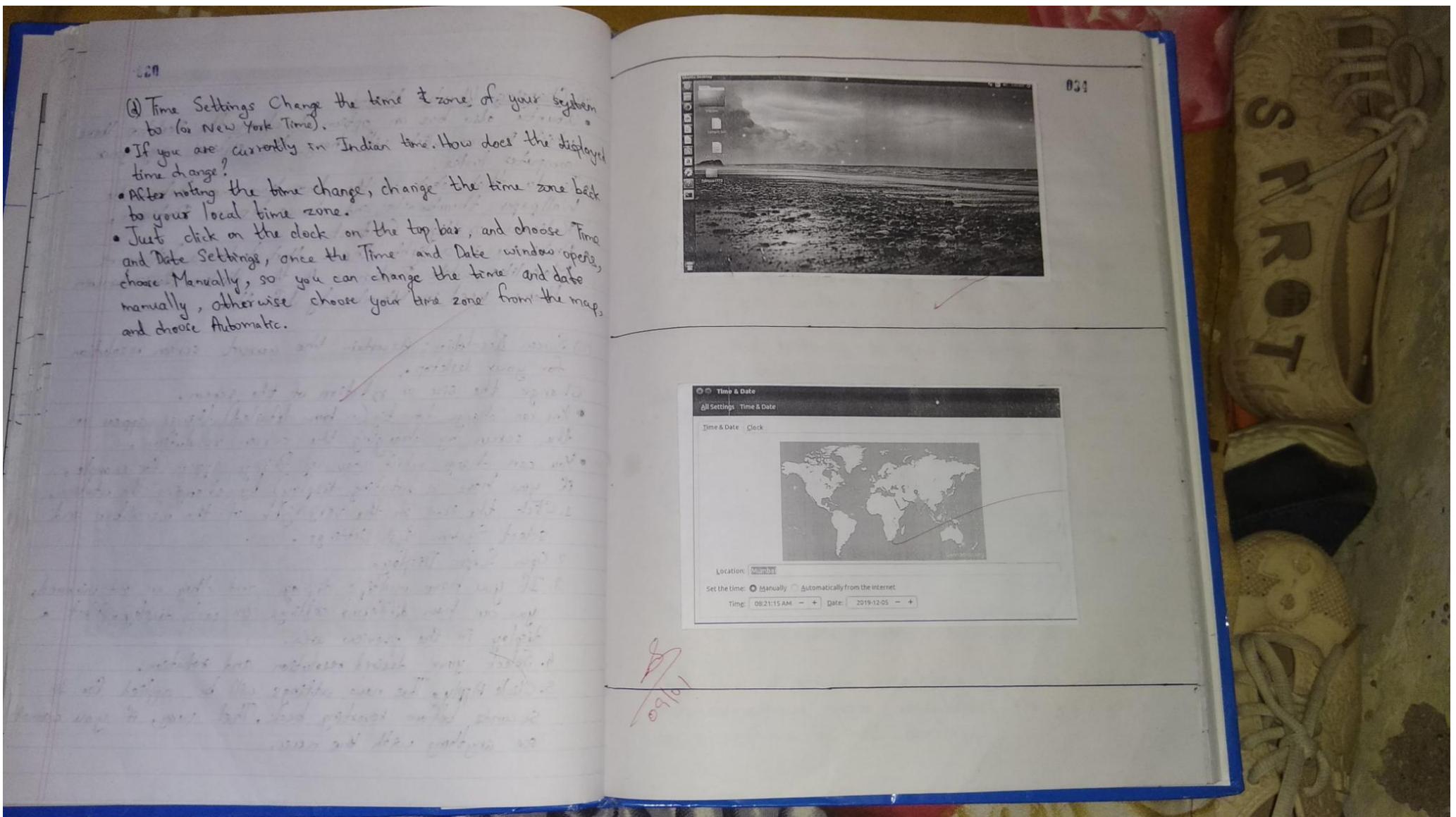
- Q) Time Settings Change the time & zones of your system to (or New York Time).
- If you are currently in Indian time. How does the displayed time change?
  - After noting the time change, change the time zone back to your local time zone.
  - Just click on the clock on the top bar, and choose Time and Date Settings, 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.



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PRACTICAL NO. 2

Aim:- Installing and removing software.

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

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

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

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

b) Uninstall GCC Compiler  
In GCC 5.1.0, although there is no top-level uninstall target, some directories do have it. In particular gcc, so you can do

Type : cd build/gcc  
sudo make uninstall

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

### PRACTICAL NO: 3

Aim:- Utilization of grep, man commands.

### Documentation:-

- ② Finding info documentation from the command line:  
Bring up the 'info' page for the 'grep' command. Bring up the usage section.
  - To find info about any command 'info' command is used. The syntax of info command is 'info (command name)'.  
We are going to find the info about the 'grep' command:

3. Open the terminal (`Ctrl + Alt + T`) and type:

info grep -i word all /etc/

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

(see also Söderström and Warr) found that most em

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**TAR(1)****GNU TAR Manual****NAME**

`tar` - an archiving utility

**SYNOPSIS**

Traditional usage

`tar [f|c|d|r|t|lu|x] [GnSklMompMsBiaJZ2hP[RwO] [ARG...]`

UNIX-style usage

```
tar -A [OPTIONS] ARCHIVE ARCHIVE
tar -c [-f ARCHIVE] [OPTIONS] [FILE...]
tar -d [-f ARCHIVE] [OPTIONS] [FILE...]
tar -t [-f ARCHIVE] [OPTIONS] [MEMBER...]
tar -r [-f ARCHIVE] [OPTIONS] [FILE...]
tar -u [-f ARCHIVE] [OPTIONS] [FILE...]
tar -x [-f ARCHIVE] [OPTIONS] [MEMBER...]
```

GNU-style usage

```
tar {--catenate | --concatenate} [OPTIONS] ARCHIVE ARCHIVE
tar --create [--file ARCHIVE] [OPTIONS] [FILE...]
tar {--diff | --compare} [--file ARCHIVE] [OPTIONS] [FILE...]
tar --delete [-f ARCHIVE] [OPTIONS] [MEMBER...]
tar --append [-f ARCHIVE] [OPTIONS] [FILE...]
tar --list [-f ARCHIVE] [OPTIONS] [MEMBER...]
tar --test-label [-f ARCHIVE] [OPTIONS] [LABEL...]
tar --update [-f ARCHIVE] [OPTIONS] [FILE...]
tar --update [-f ARCHIVE] [OPTIONS] [FILE...]
tar {--extract | --get} [-f ARCHIVE] [OPTIONS] [MEMBER...]
```

Manual name: `tar(1) Linux` (press h for help or q to quit).

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

→ To use the 'man' command simply type 'man' (command name).

Now we are going to find the manual for 'ls' command.

Simply type: `man ls`

c) Finding 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.

Simply type: `man zip`  
`man tar`

d) Finding man pages by section from the command line: Bring up the man page for the printf lib. function. Which manual page section are library function found?

→ The number corresponds to what section of the manual page is from; 1 is user command while 8 is system admin stuff. The man page for man itself explains it and lists the standard one.

There are certain terms, that have different pages in different sections (e.g. 'printf' as a command appears in section 1 as a 'stdlib' function appears in section 3);

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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 the archive. You can tell what section a term falls in with 'man -k' (equivalent to apropos command). It will do substring matches too. So you need to use "term" to limit it.

c) Command-Line Help: List the available options for the mkdir command. How can you do this?

\$ mkdir -m a=rwx directoryname  
\$ ls -l directoryname  
total 0  
\$

## ZIP(1) General Commands Manual ZIP(1)

### NAME

zip - package and compress (archive) files.

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### SYNOPSIS

zip [-aBcdDeFFfhijklmnoqrRSTuvVwxyz@:] [-longoption... ] [-b patch]

[-n suffixes] [-t date] [-tt date] [zifile [file...]] [-xi test]

zipcloak (see separate man page)

zipnote (see separate man page)

zipsplit (see separate man page)

Note: Command line processing in zip has been changed to support long options and handle all options and arguments more consistently. Some old command lines that depend on command line inconsistencies may no longer work.

### DESCRIPTION

Zip is a compression and file packaging utility for Unix, VMS, MS-DOS, OS/2, Windows 9x/NT/XP, Minix, Atari, Macintosh, Amiga, and Acorn RISC OS. It is analogous to a combination of the Unix commands tar(1) and compress(1) and is compatible with PKZIP (Phil Katz's ZIP for MS-DOS systems).

### MANUAL SECTIONS

The standard sections of the manual include:

- 1 User Commands
- 2 System Calls
- 3 C Library Functions
- 4 Devices and Special Files
- 5 File Formats and Conventions
- 6 Games et. al.
- 7 Miscellanea
- 8 System Administration tools and Daemons

Distributions customize the manual section to their specifics, which often include additional sections.

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PRACTICAL NO. 4

↳ Command Line operations:

(a) Install new package on your system

→ `sudo apt-get install [package name]`

(b) Remove the package installed.

→ `sudo apt-get remove [package name]`

(c) Find the passwd file. in / using find command.

→ `find / -name passwd`

• `/usr/share/bash-completion/completions/passwd`

• `/usr/share/doc/passwd`

• `/usr/share/tintinni/overrides/passwd`

• `/usr/bin/passwd`

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

→ `find / -maxdepth 2 -name passwd`

• `/etc/passwd`

(e) Find the passwd file under root and 2 level down.

→ `find / -maxdepth 3 -name passwd`

• `/usr/bin/passwd`

• `/etc/pam.d/passwd`

• `/etc/passwd`



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- (f) Find the password file between sub directories level 2 and 4.
- find -maxdepth 3 -mindepth 5 -name passwd
- /etc/cron.daily/passwd
  - /etc/passwd

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- (g) Create a symbolic link to the file you found in last step.
- ln -s filename1 filename2
- (h) Create an empty file example.txt and move it to /tmp directory using relative pathname.
- touch example.txt
- mv example.txt /tmp
- (i) Delete the file moved to /tmp in previous step by absolute method.
- rm /tmp/example.txt

- (j) Find the location of ls, ps and bash commands.
- # whereis ls
- ls: /bin/ls /usr/share/man/man1/ls.1.gz
- # whereis ps
- ps: /bin/ps /usr/share/man/man1/ps.1.gz
- # whereis bash
- bash: /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz

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## PRACTICAL NO. 5

### File Operations:-

Q1) Explore mounted file systems on your computer.  
Ans:- df -k

Q2) What are the different ways of exploring mounted file systems on Linux?  
Ans:- mount

Q3) Copying text from files.  
Ans:- cp command  
 mv command.

Q4) Archiving and backup the work directory using tar, gzip and bzip2 commands.  
Ans:- gzip filename.txt  
 bzip2 filename.txt

Q5) Use diff command to create diff of two files.  
Ans:- diff filename1 filename2

Q6) Use patch command to patch a file. And analyze the patch using patch command again.  
Ans:- patch <filename>.patch

```
pybccc1773@pybccc1773-VirtualBox:~$ df -h
Filesystem      Size   Used  Avail Capacity  Mounted on
udev            4096B  4096B   0B     0% /dev
tmpfs           8192B  8192B   0B     0% /run
/dev/vda1        91989M 450209  86486M  100% /dev/sda1
tmpfs           30840B  30840B  0B     0% /dev/shm
tmpfs           5120B   4B    5116B  100% /tmp
tmpfs           50807B   12B   501328B  1% /tmp/user/1000
tmpfs           10138B   12B   101328B  1% /tmp/user/1000
pybccc1773@pybccc1773-VirtualBox:~$
```

```
pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$ cat linux.txt
Python is an interpreted language.
python is an interpreted language.

Following are some tips and tricks to become pro in pubg mobile:
1.Practice your controls in training ground everyday.
2.Decide your drop while you are in lobby.
3.Never loot in open.
4.Always have a vehicle with you .
5.Don't engage in unnecessary fights .
6.Use of throwables is recommended .
7.First develop your skill in ground go for pushing rank .
8.Headphones should be used during game .
9.Never stay still , keep moving .
10.Try different close combat skills such as crouch and shoot,etc .

pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$ cat protips.txt
pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$ cat linux.txt
pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$
```

```
pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$ cp protips.txt linux.txt
pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$ cat linux.txt
Following are some tips and tricks to become pro in pubg mobile:
1.Practice your controls in training ground-everyday.
2.Decide your drop while you are in lobby.
3.Never loot in open.
4.Always have a vehicle with you .
5.Don't engage in unnecessary fights .
6.Use of throwables is recommended .
7.First develop your skill in ground go for pushing rank .
8.Headphones should be used during game .
9.Never stay still , keep moving .
10.Try different close combat skills such as crouch and shoot,etc .

pybccc1773@pybccc1773-VirtualBox:~/RsttKVS$
```

```
fybacccs1773@fybacccs1773-VirtualBox:~$ llukv5 cat linux.txt
Following are some tips and tricks to become pro in pubg mobile:
1.Practice your controls in training ground everyday.
2.Decide your drop while you are in lobby.
3.Never loot in vehicle with you .
4.Always loot in vehicle with you .
5.Don't engage in unnecessary fights .
6.use of throwables is recommended .
7.First develop your skills and then go for pushing rank .
8.Headphones should be used during game .
9.Never stay still , keep moving .
10.Try different close combat skills such as crouch and shoot,etc
```

```
pybsccs1773@pybsccs1773-VirtualBox:~$ /RttkV5 cat python.txt  
Python is an indented language.  
Python is an interpreted language.  
  
pybsccs1773@pybsccs1773-VirtualBox:~$ /RttkV5 mv python.txt linux.txt  
pybsccs1773@pybsccs1773-VirtualBox:~$ /RttkV5 cat linux.txt  
Python is an indented language.  
Python is an interpreted language.  
  
pybsccs1773@pybsccs1773-VirtualBox:~$ /RttkV5
```

```
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS diff aa.txt bb.txt
1c1
< This is the first text.
> This is the second text.
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS
```

```
Fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS/dlff -u bb.txt genre.txt >patch.patch  
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS/patch >patch.patch  
patching file bb.txt  
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS cat patch.patch  
- bb.txt 2020-01-16 08:18:39.270794765 +0330  
++ genre.txt 2020-01-16 08:22:38.186814232 +0330  
@@ -1 +1,5 @@  
-This is the second text.  
+Arcade  
+Action  
+Adventure  
+Puzzle  
+Strategy  
+Sports
```

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### PRACTICAL NO. 6

Aim:- Use Environment.

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

Ans- who command and whoami

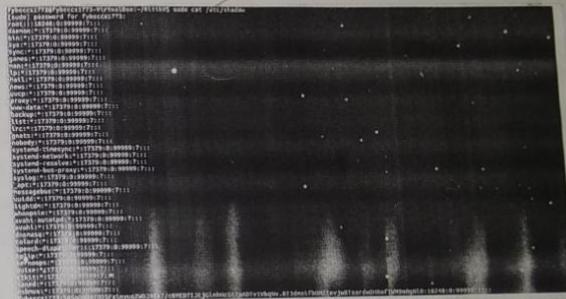
- B) Display /etc/shadow file using cat command and understand the importance of shadow file. How its different than passwd file.

Ans- cat /etc/shadow

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

- Username, up to 8 characters. Case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.
- Password, 13 character encrypted. A blank entry (e.g.::) indicates a password is not required to log in (usually a bad idea) and a "\*" entry (e.g. :\*) indicates the account has been disabled.
- The number of days (since January 1, 1970) since the password was last changed.
- The number of days before ~~may~~ password may be changed (0 indicates it may be changed at any time).
- The number of days after which password must be changed (99999 indicates user can keep his or her password unchanged for many, many years).

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```
[root@ccs177g:/home/ccs177g/virtualbox]# history
```

```
1 ls
2 cat /etc/hosts
3 cat /etc/mtab
4 cd /etc
5 rm -rf /etc/hosts
6 rm -rf /etc/mtab
7 cat /etc/motd
8 sudo apt-get install gcc
9 sudo apt-get install gcc
10 who
11 cd Desktop
12 cd Desktop
13 cd Desktop
14 cd Desktop
15 cat -pupg.txt
16 cat pupg.txt
17 cat pupg.txt
18 nano ls
19 nano ls
20 nano ls
21 nano ls
22 ls -a
23 nano ls
24 nano ls
25 nano ls
26 nano ls
27 ls -l
28 nano ls
29 nano h
30 nano ls
31 nano ls
32 nano ls
33 ls -l
34 nano ls
35 nano ls
36 ls -l --sort=-
37 nano tar
38 /bin/cat > /tmp/test777 </dev/null
39 /bin/cat > /tmp/test777 </dev/null
40 find / -name password > /tmp/test777 </dev/null man tar
41 /bin/cat > /tmp/test777 </dev/null man tar
42 find / -name=patch 2>> /tmp/test777 </dev/null man passed
43 find / -name=patch 3>> /tmp/test777 </dev/null man passed
```

- The number of days to warn user of an expiring password (7 for a full week).
  - The number of days after password expires that account is disabled.
  - The number of days since January 1, 1970 that an account has been disabled.
  - A reserved field for possible future use.

Each field in a passwd entry is separated with ":" colon characters and are as follows:

- Username, up to 8 characters. Case-sensitive, usually all lowercase.
  - An "x" in the password field. Passwords are stored in the "/etc/shadow" file.
  - Numeric user id. This is assigned by the "adduser" script. Unix uses this field, plus the following group field, to identify which files belong to 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.
  - 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).

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c) Get your current working directory.

Ans- `pwd`

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

Ans- `history`  
`!line number`

e) Create alias to most commonly used commands.

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

Ans- `alias label = "command"`

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```
fybsccs1773@fybsccs1773-VirtualBox:~/Ritikv$ 11
who
fybsccs1773 tty7          2019-12-19 02:30 (:0)
fybsccs1773@fybsccs1773-VirtualBox:~/Ritikv$ 110
pwd
/home/fybsccs1773/Ritikv
```

```
fybsccs1773@fybsccs1773-VirtualBox:~/Ritikv$ alias h='history'
fybsccs1773@fybsccs1773-VirtualBox:~/Ritikv$ h
1  ls
2  cd Ritikv
3  cd Ritikv
4  cd Ritikv
5  cd Ritikv
6  vi linux.txt
7  cat linux.txt
8  sudo apt-get install gcc
9  sudo apt-get install gcc
10 who
11 who
12 cd Desktop
13 cd Desktop
14 cd Desktop
15 vi pubg.txt
16 cat pubg.txt
17 cat pubg.txt
18 man ls
19 man ls
20 man tar
21 man -h
22 ls -a
23 ls -all
24 ls -l
25 ls -A
26 ls -l
27 ls -l
28 ls -l
29 man ls
30 ls -l -h
31 ls -l -h
32 ls --al
33 ls --al
34 linux.txt
35 man ls
36 man ls
37 man tar
38 man tar
39 fybsccs1773@fybsccs1773-VirtualBox:~/Desktop$ man tar
40 find / -name passed
41 fybsccs1773@fybsccs1773-VirtualBox:~/Desktop$ man tar
42 find / -maxdepth 2 -name passed
43 find / -maxdepth 3 -name passed
```

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Following are some tips and tricks to become pro in pubg mobile:

1. Practice your controls in training ground everyday.
2. Decide your drop while you are in lobby.
3. Never loot in open.
4. Always have a vehicle for you.
5. Don't engage in unnecessary fights.
6. Use of throwables is recommended.
7. First develop your skills and then go for pushing rank.
8. Headphones should be used during game.
9. Never stay still, keep moving.
10. Try different close combat skills such as crouch and shoot, etc.

### PRACTICAL NO. 7

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Aim:- To use the operations of Vi editor.

Q) 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) press / 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.

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### 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 beginning of the word.
0(zero)	Moves to first character of a line.
\$	Moves to end of line.

### Scrolling.

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

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

(i) Replace.

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

(ii) Highlight.

Use set hsearch

(iii) Show the line number.

Use set nu.

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```
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:~$
```

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

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

### PRACTICAL NO. 8

Pg 8

#### Linux Security:

- a) Use of sudo to change user privilege to root.

Create a user named user1

To give some users root privileges edit /etc/sudoers using visudo. Enter new line as ALL=(ALL:ALL)ALL .

- b) Identify operations that require sudo privileges.

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

-E : Expiration Date

-m : Minimum number of days before password change.

-M : Number of days password is valid.

-I : Account inactive.

-W : Number of days of warning before a password change is required.

- d) Delete newly added user

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# Please consider adding local content in /etc/sudoers.d/ instead of  
# directly modifying this file.  
#  
Defaults env\_reset  
Defaults mail\_badpass  
Defaults secure\_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin"  
# Host alias specification  
# User alias specification  
# Cmnd alias specification  
# User privilege specification  
root ALL=(ALL:ALL) ALL  
user1 ALL=(ALL:ALL) ALL

050

```
fybsccs173@fybsccs173-virtualbox:~$ /RtlKvS rtmconfig  
enp3s0 Link encap:Ethernet HWaddr 00:0c:29:7c:b7:39  
inet netd addr: 10.0.2.15 brd: 10.0.2.255 Mask: 255.255.255.0  
inet6 addr: fe80::40c:29ff:fe7c:b739/64 Scope:Link  
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1  
RX packets:10629 errors:0 dropped:0 overrun:0 frame:0  
TX packets:5511 errors:0 dropped:0 overrun:0 carrier:0  
collisions:0 txqueuelen:1000  
RX bytes:1000000 (N/A KB) TX bytes:3474900 (347.4 KB)  
  
lo Link encap:Local Loopback  
inet netd addr:127.0.0.1 brd: 127.0.0.0 Mask: 255.0.0.0  
inet6 addr: ::1/128 Scope:Host  
UP LOOPBACK MTU:65536 Metric:1  
RX packets:263 errors:0 dropped:0 overrun:0 frame:0  
TX packets:263 errors:0 dropped:0 overrun:0 carrier:0  
collisions:0 txqueuelen:1000  
RX bytes:21853 (21.8 KB) TX bytes:21853 (21.8 KB)  
  
fybsccs173@fybsccs173-virtualbox:~$ /RtlKvS
```

```
fybsccs1773@fybsccs1773-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.166.164) 56(84) bytes of data.
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=2 ttl=55 time=317 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=3 ttl=55 time=291 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=4 ttl=55 time=296 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=5 ttl=55 time=294 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=6 ttl=55 time=329 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=7 ttl=55 time=291 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=8 ttl=55 time=294 ms
64 bytes from b0m7t0s20.ln-f4.1e100.net (172.217.166.164): icmp_seq=9 ttl=55 time=329 ms
PC
--www.google.com ping statistics--
10 packets transmitted, 5 received, 95% packet loss, time 9072ms
rtt min/avg/max/mdev = 291.895/305.004/329.501/44.960 ms
fybsccs1773@fybsccs1773-VirtualBox:~$ rttkvs
```

```
fbsccs1773@fbsccs1773-VirtualBox:~/RitikKV$ dig 127.0.0.1  
;; <>> DIG 9.10.3-P4-Ubuntu <>> 127.0.0.1  
;; global options: +cmd  
;; Got answer:  
;; ->>>HEADER<- opcode: QUERY, status: NOERROR, id: 29519  
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  
  
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags: udp: 1280  
;; QUESTION SECTION:  
127.0.0.1. IN A  
  
;; ANSWER SECTION:  
127.0.0.1. 0 IN A 127.0.0.1  
  
;; Query time: 0 msec  
;; SERVER: 127.0.1.1#53(127.0.1.1)  
;; WHEN: Thu Jan 16 08:57:40 IST 2020  
;; MSG SIZE rcvd: 54  
  
fbsccs1773@fbsccs1773-VirtualBox:~/RitikKV$
```

PRACTICAL NO. 9

## Network Management :

- a) Get IP address of your machine using ifconfig
  - b) Get hostname of your machine.
  - c) Use ping to check the network connectivity to remote machines.
  - d) Use of dig command.
  - e) Troubleshooting network using traceroute, route command
  - f) Use of arp command.
  - g) Use of host command.
  - h) Use of netstat command and Nmap command.

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```
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS traceroute to 127.0.0.1 (127.0.0.1), 30 hops max, 60 byte packets
traceroute to 127.0.0.1 (127.0.0.1), 30 hops max, 60 byte packets
1 localhost (127.0.0.1) 0.161 ms 0.146 ms 0.139 ms
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS
```

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```
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS route
Kernel IP routing table
Destination     Gateway      Genmask      Flags Metric Ref  Use Iface
default         *           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
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS
```

```
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS nmap
nmap 7.01 ( https://nmap.org ) at 2020-01-16 09:23 IST
Usage: nmap [Scan Type(s)] [Options] [target specification]
[TARGET SPECIFICATIONS]
  Targets: IP addresses, networks, etc.
  -r IP:Range[,...] IP range (e.g., 192.168.0.1; 10.0.0-255.1-254)
  -iL hostsfile: Input file of hosts/networks
  -iN hostlist: Host list from hostlist file
  -eclude hostsfile: hosts[...]
  -ecludefile file: exclude hosts/networks
  -eclude hostsfile,file: exclude list from file
[HOST DISCOVERY]
  -SL: List Scan - simply lists targets to scan
  -PN: Ping scan - skip hosts discovery
  -PR: Treat all hosts as online -- skip host discovery
  -PS/PP/PU/P[portlist]: TCP SYN/ACK, UDP or SCTP discovery to given ports
  -PA/PT/PU/UP[portlist]: TCP ACK request discovery probes
  -PP/protocol list: IP Protocol Ping
  -Hhost: Host header to use for probe (default: sometimes)
  -dNS-servers dnserv1,dnserv2,...: specify custom DNS servers
  -sS: Scan via OS's DNS resolver
  -sT: Trace hop path to each host
[SCAN TECHNIQUES]
  -sU/UH/UD/UD: TCP SYN/Connect() /ACK/Window/HalfOpen scans
  -sM/M: TCP MSL, FIN, and XMAS scans
  -sC/C: Customized scan flags
  -sA/A: All ports (iprange)-1: Idle scan
  -sV/V: TCP INIT/COOKIE-ECHO scans
  -sX/X: TCP FIN/FTP bounce scan
  -sF/F: TCP FIN scan
  -sT/T: TCP SYN scan
  -sO/O: TCP SYN scan of specified ports
  -Ex:x: Exclude ports ranges -> Exclude the specified ports from scanning
  -FF: Scan ports consecutively -> don't randomize
  -TT: Scan ports randomly -> scan more common ports
  -PP: Probe open ports more often than <i>t</i>
[PORT SPECIFICATION AND SCAN ORDER]
  -pp/p1-p2-p3-p4: Specific ports
  -pU/U1-U2-U3-U4: UDP ports
  -pU1-U2-U3-U4: UDP ports ranges -> Exclude the specified ports from scanning
  -FF: Scan ports consecutively -> don't randomize
  -TT: Scan ports randomly -> scan more common ports
  -PP: Probe open ports more often than <i>t</i>
[SERVICE/VERSION DETECTION]
  -sV: Probe open ports to determine service/version info
  -v: version detection (intensity 5)
  -vv: version/light: light to most likely probes (intensity 2)
  -v: version-all: Try every single probe (intensity 9)
  -v: version-trace: Show detailed version scan activity (for debugging).
  -script script: Script scan
```

fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS nmap 127.0.0.1
Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-16 09:23 IST
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000036s latency).
All 1000 scanned ports on localhost (127.0.0.1) are closed
Nmap done: 1 IP address (1 host up) scanned in 1.10 seconds
fybsccs1773@fybsccs1773-VirtualBox:~/RitikVS

tcsc@tcsc-VirtualBox: ~

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

tcsc@tcsc-VirtualBox: ~

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

tcsc@tcsc-VirtualBox: ~

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

"linux.sh" [New File]

PRACTICAL NO. 10

053

Aim: Shell Scripting

Basics of shell scripting

- (a) To get a shell, you need to start a terminal.
- (b) To see what shell you have, run: echo \$SHELL
- (c) In linux, the dollar sign (\$) stands for shell variable.
- (d) The echo command just returns whatever you type in
- (e) #!/bin/bash - It is called shebang. It is written at the top of a shell script and it passes the instruction to the program /bin/bash.

Echo \$SHELL

- vi filename.sh
- #!/bin/bash
- echo "THIS IS LINUX!"
- chmod 777 filename.sh
- ./filename.sh

Step to write and execute a shell script.

Shell script is just a simple text file with .sh extension, having executable permission.

- (a) Open terminal.
- (b) Navigate to the place where you want to create script using cd command.
- (c) Touch filename.sh
- (d) Vi filename.sh [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).

Q30

Program to display your name.

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

Program to find the sum of two variables.

```
n filename.sh
#!/bin/bash
a=100
b=25
Sum=$((a+b))
Echo "Sum is: $sum"
```

### Sed

Sed command or Stream Editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, find and 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 txt file.

(1) Display partial text of a file.

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

(2) Display all except some lines.

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

(3) Deleting a line

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

```
tcsc@tcsc-VirtualBox:~$ ./ubuntu.sh
Enter your name:
TANVI
My name is: TANVI
tcsc@tcsc-VirtualBox:~$
```

④ Search and Replacing a string.

's' option is for searching a word.

⑤ Replace a string on a particular line.

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

⑥ Add a line after 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'.

⑦ 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 line

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

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27/02

The image contains three vertically stacked screenshots of a terminal window from a Linux environment (tcsc@tcsc-VirtualBox).  
 Top screenshot: Displays a script with variables a=100 and b=25, calculates their sum, and prints it. The command is: `#!/bin/bash  
a=100  
b=25  
sum=$((a+b))  
echo "Sum is:$sum"`  
 Middle screenshot: Shows the creation and execution of a script named linux2.sh. The commands are: `tcsc@tcsc-VirtualBox:~$ vi linux2.sh  
tcsc@tcsc-VirtualBox:~$ chmod 777 linux2.sh  
tcsc@tcsc-VirtualBox:~$ ./linux2.sh  
Sum is:125  
tcsc@tcsc-VirtualBox:~$`  
 Bottom screenshot: Shows the modification of a file named lin.sh. The command is: `tcsc@tcsc-VirtualBox:~$ vi lin.sh  
#!/bin/bash  
sum=$(( $1+$2 ))  
echo "sum is:$sum"`  
 A status message at the bottom of the terminal window reads: "lin.sh" 3 lines, 46 characters