

- Sem II Practical no: 1 Linux 37
- Aim:-
1. Install your choice of Linux distribution
eg. Ubuntu, Fedora
 2. Customize desktop environment by changing different default options like changing default background, themes, screen savers
 3. Screen Resolution
 4. Time settings.
- Installation.
- Step 1: After installing virtual box don't
- Step 2: Click on start button and select the system / os you want to install.
- Step 3: Allocate some space for your os, click next
- Step 4: For hard disk, click hard disk type EVO and next
- Step 5: Enter your file name or because it
- Step 6: Now after selecting the operating system just click on the next button

Practical no: 1

- Ques:-**
- 1) Install your choice of Linux distribution
eg. Ubuntu, Fedora
 - 2) Customize desktop environment by changing different default options like changing default background, themes, screen savers
 - 3) Screen Resolution
 - 4) Time settings.

Installation:

Step 1: After installing virtual box run it

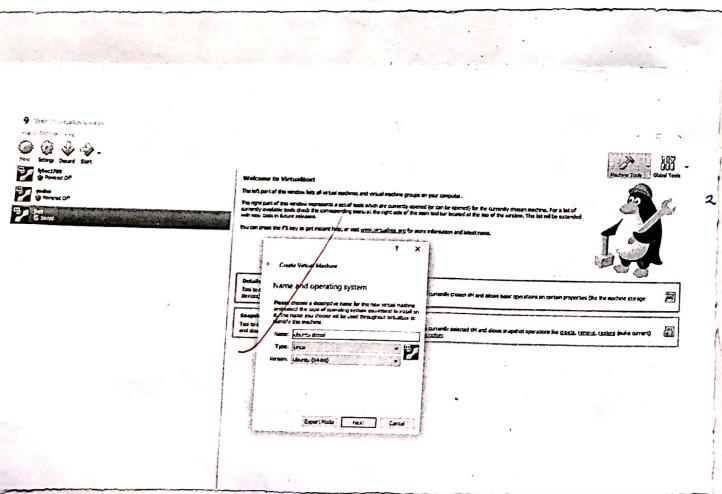
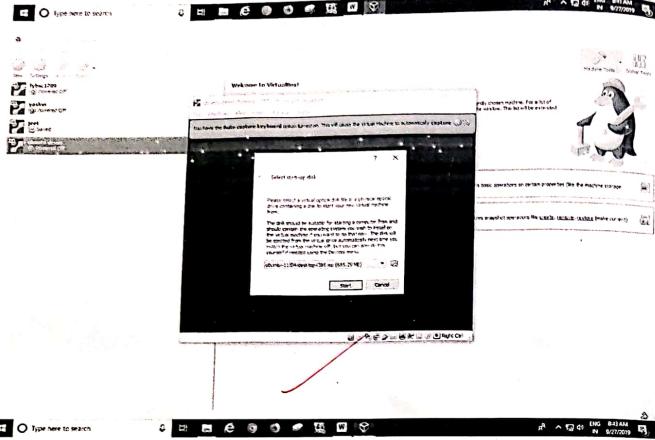
Step 2: Click on start button and select the system / OS you want to install.

Step 3: Allocate some space for your OS. click next

Step 4: For hard disk, click hard disk type ESD and next

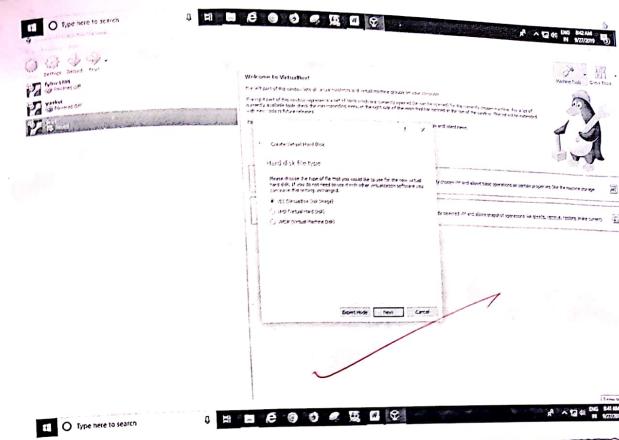
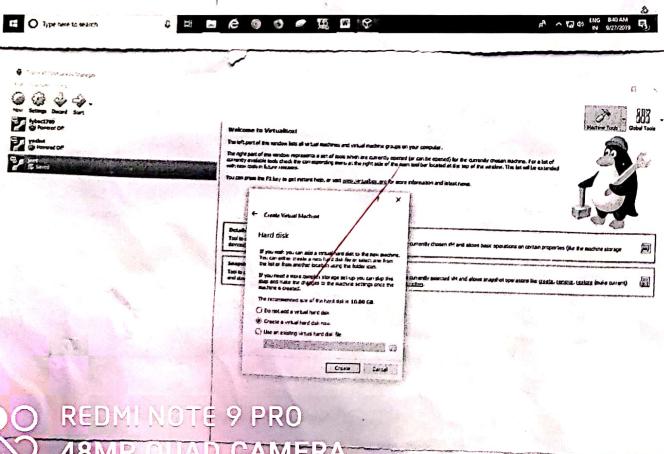
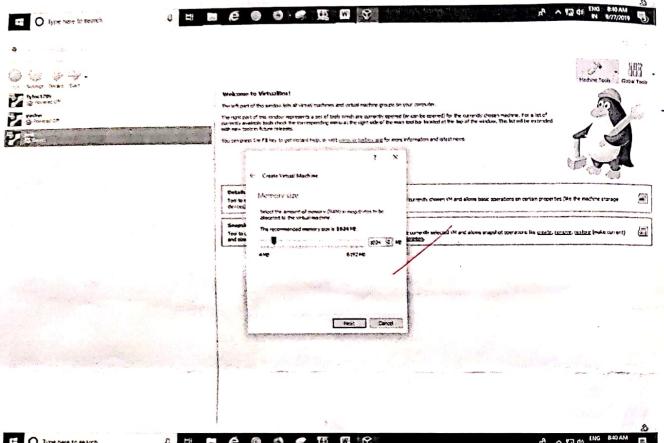
Step 5: Enter your file name or browse it

Step 6: Now after selecting the operating system just click on the next button

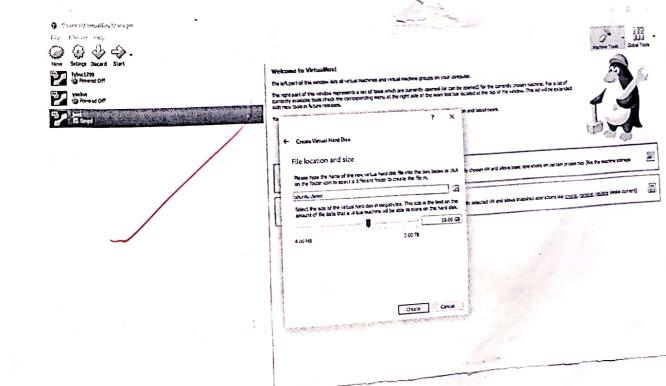


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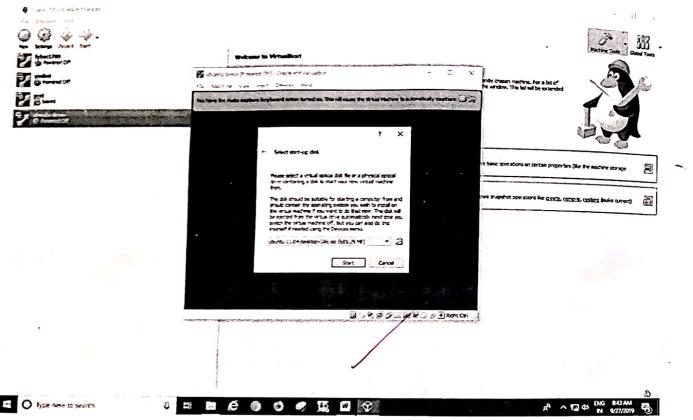
Step 7:- Now allocate space for your operating system, just click on the next button.



Step 8:- After clicking hard Disk it will ask for hard disk type VD and click on next button



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→ Select your location and press forward button.
→ Choose your keyboard layout.

→ Choose your keyboard layout.

→ After doing previous all the process the installation process will start. It takes few hours for installation - maximum 1 day

→ After completion of installation process Ubuntu give a window Installation has finished. You can continue testing Ubuntu now but until you restart the computer, any changes you make or document you save will not be preserved.

→ Changing wall paper picture:

- 1) On the left side of Background part, you can see your current wallpaper.
- 2) On the right side is part where we can select one of Ubuntu's wall papers. Clicking on any thumbnail will change our wallpaper.
- 3) If you want to select wallpaper from your pictures folder, click the drop-down 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.
- 4) To add wallpaper that is in another folder, just click the plus icon below the thumbnails & then in pop-up window, select the path to custom folder & choose the picture inside it.

→ Changing Ubuntu theme:- 1) Ubuntu also has an option to change the desktop theme, which in one click will change the entire way the computer looks. To do that, click on the drop-down menu below the wallpaper, thumbnails and choose between Ambiance, Radiance, or high contrast.
2) Ambiance is a light theme that looks a bit more Mac-like, while Radiance is the darker brown theme used in Ubuntu by default.

⇒ Time setting change the time zone of your system.
i) If you are currently in Indian time, how does the displayed time change?
e) After noting the time, change the time zone back to your local time zone.
e) Just click on the clock on the top bar, and choose 'time and date' settings. Once the time & date window opens, choose 'manually' so you can change the time & 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

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

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

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

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

→ Now to UNINSTALL GCC COMPILER.

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

Type: cd build/gcc

For 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

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Practical Utilization of grep, man commands.

a) finding info documentation from the command line. bring up the info page for the grep command. Bring up the woe section.

As To find info about any command info command is weak. The syntax of info command is @ info command name

We are giving to find the info about the grep command.

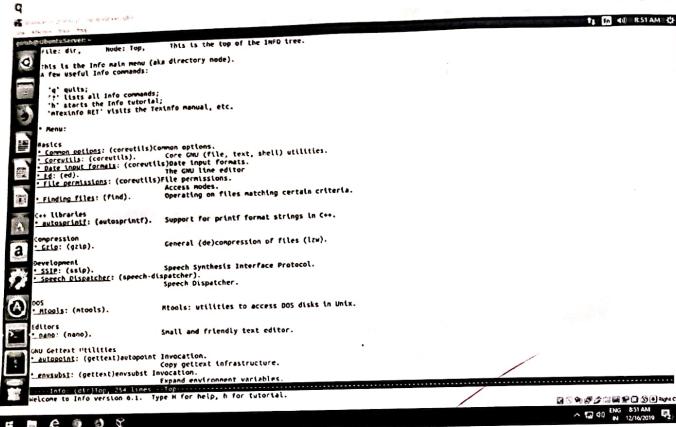
Open the terminal (ctrl+Alt+T) and type:

info grep

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

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

Another more summarized form of showing info is the man command. The command is same as info, but displays data in a more readable form.



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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 type 'man (command name)'

Now we are going to find the manual for its command prompt.

~~Simply type: 'man ls'.~~

c) finding man pages by topic. What man pages are available that document file compression?

Ans 'tar', 'zip' are some man pages which are available to document file compression. simply type `man zip`

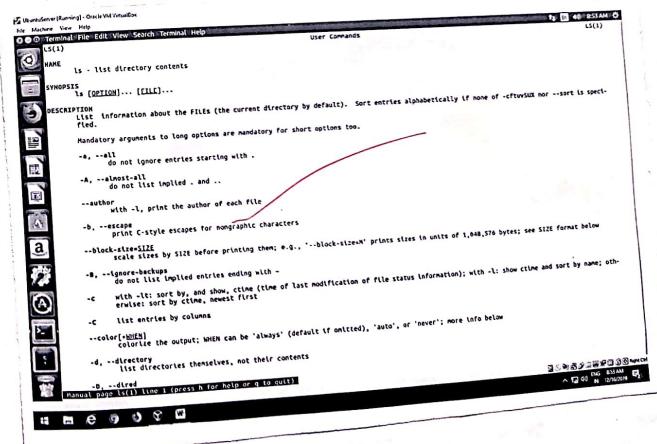
d.) finding man pages by sections from the command line
bring up the man page for the `fsck` lib. function
which manual page sections are library function found
`fsck` (source : manpage) (function)

Ans. The number corresponds to what section of the manual page. 1 is for user command, while 8 is system stuff. The man page for more itself explains it and lists the std ones.

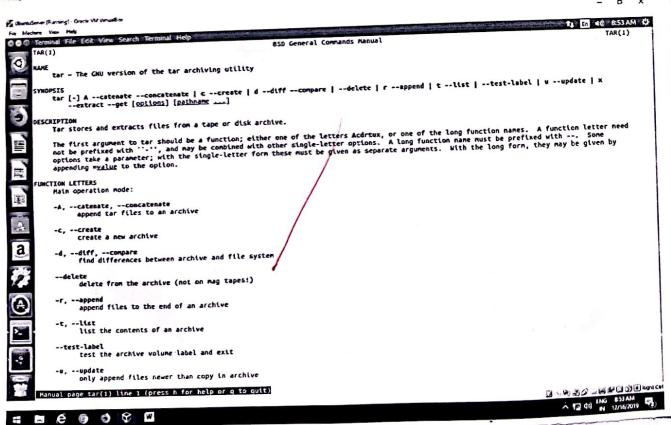
Manual sections

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, etc.
 - 7. ~~Miscellaneous~~
 - 8. System Administration tools and Daemons



\$ man 1 printf	(1) - format & print data
\$ man 3 printf	(1p) - write formatted output
\$ man -a printf	(3) - formatted output conversion
\$ man -k '^printf'	(3p) - print formatted output
printf	(1) - format & print data
printf	(1p) - write formatted output
printf	(3) - formatted output conversion
printf	(3p) - print formatted output
printf [builtins]	(1) - bash built-in commands, see <code>bash()</code>



There are certain terms that have different pages in different sections (e.g., print) as a command appears in section 1 ... as a std lib function appears in section 31 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 -s to show every matching page in a row

You can tell what section terms falls in with man -k (equivalent to a proper command). It will do subbing matches too. So you need to use "term" to limit it.

~~c) Command-line Help list the available options for the mkdbs command. How can you do this~~

\$ mklis - m $\alpha = \delta - \omega x$ discretionary norm

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Pract 4:

Topic: Command Line Operations

- Install new package on your system.
guido@apt-get install (package name)
- Remove the package installed on your system.
sudo apt-get remove (package name)
- Find the password file present using find command.
find / -name password
• /usr/share/doc/nessus-ldap-253/passwd
• /usr/bin/passwd
• /etc/pam.d/passwd
• /etc/passwd

Find the password file under root and one level down.

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

Find the password file under root and 2 level down.
find / -maxdepth 3 -name password

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

Find the password file b/w sub-directories, level 2 & 3.

find -maxdepth 3 -maxdepth 2 -name password

- /usr/bin/passwd
• /etc/pam.d/passwd

d) Create an empty file & move it to /tmp directory using relative path name

ln -sfile1 file2

e) Create an empty file & move it to /tmp directory using relative path name

touch example.txt
mv example.txt /tmp

f) Delete the file moved to /tmp in previous step by method

rm /tmp/example.txt

Topic:- File Operations:-

1.) Explore mounted file system on your computer
Ans: df -k

```
jeba@jeba-VirtualBox:~$ df -k
Filesystem      1K-blocks    Used Available Use% Mounted on
udev             494436       0   494436  0% /dev
tmpfs            102216   3676   98740  2% /run
/dev/sda1        7092728 3383372 3326824  5% /
tmpfs            512076   216   511860  1% /dev/shm
tmpfs             5120       4   511916  1% /run/lock
tmpfs            512076       0   512076  0% /sys/fs/cgroup
tmpfs            102416    48   102368  1% /run/user/1000
```

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

```
jeba@jeba-VirtualBox:~$ mount
rootfs on / type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type procfs (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=060)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,ptmxmode=060)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,errors=remount-ro)
tmpfs on /run/lock type tmpfs (rw,nosuid,noexec,relatime,errors=remount-ro)
tmpfs on /run/shm type tmpfs (rw,nosuid,noexec,relatime,errors=remount-ro)
security on /dev/shm type tmpfs (rw,nosuid,noexec,relatime,errors=remount-ro)
tmpfs on /run/user/1000 type tmpfs (rw,nosuid,noexec,relatime,errors=remount-ro)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_agent=/lib/systemd/systemd)
cgroup on /sys/fs/cgroup/systemd/agent type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_agent=/lib/systemd/systemd)
cgroup on /sys/fs/cgroup/pstore type pstore (rw,nosuid,nodev,noexec,relatime,cpuset,nrroots=1)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nrroots=1)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net_cls,net_prio,nrroots=1)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsrroots=1)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsrroots=1)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsrroots=1)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,nsrroots=1)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsrroots=1)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsrroots=1)
cgroup on /sys/fs/cgroup/bkts type cgroup (rw,nosuid,nodev,noexec,relatime,bkts,nsrroots=1)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsrroots=1)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event,nsrroots=1)
cgroup on /sys/fs/cgroup/hugepages type cgroup (rw,nosuid,nodev,noexec,relatime,hugepages,nsrroots=1)
cgroup on /sys/fs/cgroup/misc type cgroup (rw,nosuid,nodev,noexec,relatime,misc,nsrroots=1)
systemd on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,prg=1,timeout=0,nbsp=1)
rotor=asyncport=5,direct)
hugepages on /dev/hugepages type hugepages (rw,relatime)
```

3) Copying text from files:
Ans cp command, mv command

4) Archiving and back up the work directory using tar, gzip and bzip2 commands:

Ans and Bzip_2 compression
 gzip filename.txt
 Bzip2 filename.txt

Ans Use diff command to create diff of two files.

c.) Use patch command to patch a file. And analyse the patch using patch command again.

```
jeba@jeba-VirtualBox:~/.jeb$ ls
Desktop Documents examples_desktop_11 Pictures Temp
jeba@jeba-VirtualBox:~/.jeb$ cd jeb
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat gg-ttt
cat: gg-ttt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat -gg-ttt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ touch dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt
jeba@jeba-VirtualBox:~/jeb$ cp gg.txt dd.txt
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt
welcome
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$
```

```
jabajeba-VirtualBox:/$ tar -cvf data.tar /mn  
tar: data.tar: cannot open: Permission denied  
tar: Error is not recoverable: exiting now  
jabajeba-VirtualBox:/$ sudo tar -cvf data.tar /mn  
tar: Renoving leading '/' from member names  
/mn/  
/mn/hd/  
jabajeba-VirtualBox:/$ ls  
bin  data.tar  etc  lib  mn  opt  run  srv  usr  
boot  dev  home  libgcc  lost+found  mnt  proc  sbin  sys  var  
cdrom  dev  libstdc++.so.6  libxml2  libxml2.so.6  libxml2.so.6.0.0  libxml2.so.6.0.1  libxml2.so.6.0.2  libxml2.so.6.0.3  libxml2.so.6.0.4  libxml2.so.6.0.5  libxml2.so.6.0.6  libxml2.so.6.0.7  libxml2.so.6.0.8  libxml2.so.6.0.9  libxml2.so.6.0.9.1  libxml2.so.6.0.9.2  libxml2.so.6.0.9.3  libxml2.so.6.0.9.4  libxml2.so.6.0.9.5  libxml2.so.6.0.9.6  libxml2.so.6.0.9.7  libxml2.so.6.0.9.8  libxml2.so.6.0.9.9  libxml2.so.6.0.9.10  libxml2.so.6.0.9.11  libxml2.so.6.0.9.12  libxml2.so.6.0.9.13  libxml2.so.6.0.9.14  libxml2.so.6.0.9.15  libxml2.so.6.0.9.16  libxml2.so.6.0.9.17  libxml2.so.6.0.9.18  libxml2.so.6.0.9.19  libxml2.so.6.0.9.20  libxml2.so.6.0.9.21  libxml2.so.6.0.9.22  libxml2.so.6.0.9.23  libxml2.so.6.0.9.24  libxml2.so.6.0.9.25  libxml2.so.6.0.9.26  libxml2.so.6.0.9.27  libxml2.so.6.0.9.28  libxml2.so.6.0.9.29  libxml2.so.6.0.9.30  libxml2.so.6.0.9.31  libxml2.so.6.0.9.32  libxml2.so.6.0.9.33  libxml2.so.6.0.9.34  libxml2.so.6.0.9.35  libxml2.so.6.0.9.36  libxml2.so.6.0.9.37  libxml2.so.6.0.9.38  libxml2.so.6.0.9.39  libxml2.so.6.0.9.40  libxml2.so.6.0.9.41  libxml2.so.6.0.9.42  libxml2.so.6.0.9.43  libxml2.so.6.0.9.44  libxml2.so.6.0.9.45  libxml2.so.6.0.9.46  libxml2.so.6.0.9.47  libxml2.so.6.0.9.48  libxml2.so.6.0.9.49  libxml2.so.6.0.9.50  libxml2.so.6.0.9.51  libxml2.so.6.0.9.52  libxml2.so.6.0.9.53  libxml2.so.6.0.9.54  libxml2.so.6.0.9.55  libxml2.so.6.0.9.56  libxml2.so.6.0.9.57  libxml2.so.6.0.9.58  libxml2.so.6.0.9.59  libxml2.so.6.0.9.60  libxml2.so.6.0.9.61  libxml2.so.6.0.9.62  libxml2.so.6.0.9.63  libxml2.so.6.0.9.64  libxml2.so.6.0.9.65  libxml2.so.6.0.9.66  libxml2.so.6.0.9.67  libxml2.so.6.0.9.68  libxml2.so.6.0.9.69  libxml2.so.6.0.9.70  libxml2.so.6.0.9.71  libxml2.so.6.0.9.72  libxml2.so.6.0.9.73  libxml2.so.6.0.9.74  libxml2.so.6.0.9.75  libxml2.so.6.0.9.76  libxml2.so.6.0.9.77  libxml2.so.6.0.9.78  libxml2.so.6.0.9.79  libxml2.so.6.0.9.80  libxml2.so.6.0.9.81  libxml2.so.6.0.9.82  libxml2.so.6.0.9.83  libxml2.so.6.0.9.84  libxml2.so.6.0.9.85  libxml2.so.6.0.9.86  libxml2.so.6.0.9.87  libxml2.so.6.0.9.88  libxml2.so.6.0.9.89  libxml2.so.6.0.9.90  libxml2.so.6.0.9.91  libxml2.so.6.0.9.92  libxml2.so.6.0.9.93  libxml2.so.6.0.9.94  libxml2.so.6.0.9.95  libxml2.so.6.0.9.96  libxml2.so.6.0.9.97  libxml2.so.6.0.9.98  libxml2.so.6.0.9.99  libxml2.so.6.0.9.100  libxml2.so.6.0.9.101  libxml2.so.6.0.9.102  libxml2.so.6.0.9.103  libxml2.so.6.0.9.104  libxml2.so.6.0.9.105  libxml2.so.6.0.9.106  libxml2.so.6.0.9.107  libxml2.so.6.0.9.108  libxml2.so.6.0.9.109  libxml2.so.6.0.9.110  libxml2.so.6.0.9.111  libxml2.so.6.0.9.112  libxml2.so.6.0.9.113  libxml2.so.6.0.9.114  libxml2.so.6.0.9.115  libxml2.so.6.0.9.116  libxml2.so.6.0.9.117  libxml2.so.6.0.9.118  libxml2.so.6.0.9.119  libxml2.so.6.0.9.120  libxml2.so.6.0.9.121  libxml2.so.6.0.9.122  libxml2.so.6.0.9.123  libxml2.so.6.0.9.124  libxml2.so.6.0.9.125  libxml2.so.6.0.9.126  libxml2.so.6.0.9.127  libxml2.so.6.0.9.128  libxml2.so.6.0.9.129  libxml2.so.6.0.9.130  libxml2.so.6.0.9.131  libxml2.so.6.0.9.132  libxml2.so.6.0.9.133  libxml2.so.6.0.9.134  libxml2.so.6.0.9.135  libxml2.so.6.0.9.136  libxml2.so.6.0.9.137  libxml2.so.6.0.9.138  libxml2.so.6.0.9.139  libxml2.so.6.0.9.140  libxml2.so.6.0.9.141  libxml2.so.6.0.9.142  libxml2.so.6.0.9.143  libxml2.so.6.0.9.144  libxml2.so.6.0.9.145  libxml2.so.6.0.9.146  libxml2.so.6.0.9.147  libxml2.so.6.0.9.148  libxml2.so.6.0.9.149  libxml2.so.6.0.9.150  libxml2.so.6.0.9.151  libxml2.so.6.0.9.152  libxml2.so.6.0.9.153  libxml2.so.6.0.9.154  libxml2.so.6.0.9.155  libxml2.so.6.0.9.156  libxml2.so.6.0.9.157  libxml2.so.6.0.9.158  libxml2.so.6.0.9.159  libxml2.so.6.0.9.160  libxml2.so.6.0.9.161  libxml2.so.6.0.9.162  libxml2.so.6.0.9.163  libxml2.so.6.0.9.164  libxml2.so.6.0.9.165  libxml2.so.6.0.9.166  libxml2.so.6.0.9.167  libxml2.so.6.0.9.168  libxml2.so.6.0.9.169  libxml2.so.6.0.9.170  libxml2.so.6.0.9.171  libxml2.so.6.0.9.172  libxml2.so.6.0.9.173  libxml2.so.6.0.9.174  libxml2.so.6.0.9.175  libxml2.so.6.0.9.176  Sustar rootroot@mn:~/Desktop$
```

```
jeb@jeba-VirtualBox:~/jeb$ bztp2-ss.txt .
dd.txt.gz ss.txt.bz2
jeb@jeba-VirtualBox:~/jeb$ ls
BzH9AY&SV-[0]_Jeba[1]
'JewSSeef[1]_Jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeb@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz ss.txt.bz2
jeb@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
d.txt@0x1e=Meooooo[0]xzebla@jeba-VirtualBox:~/jeb$ █
```

```
jebab@jeba-VirtualBox:~/Desktop$ ls
drwxr-xr-x 2 jebab jebab 4096 Dec 10 14:33 Desktop
jebab@jeba-VirtualBox:~/Desktop$ rm aa.txt
hello world

jebab@jeba-VirtualBox:~/Desktop$ jebab cat bbb.txt
this is Linux<
jebab@jeba-VirtualBox:~/Desktop$ jebab diff aa.txt b.txt
1de
< hello world
jebab@jeba-VirtualBox:~/Desktop$ jebab cat >bbb.txt
this is Linux
^C
jebab@jeba-VirtualBox:~/Desktop$ jebab diff aa.txt b.txt
1de
< hello world
> this is Linux
jebab@jeba-VirtualBox:~/Desktop$ jebab gzip aa.txt
jebab@jeba-VirtualBox:~/Desktop$ jebab gzip bb.txt
jebab@jeba-VirtualBox:~/Desktop$ jebab gzip -c aa.txt > bb.txt.gz
Binary files aa.txt.gz and bb.txt.gz differ
```

Practical No: 6

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Topic: - Use Environment

Ques: Which account you are logged in? How do you find out?
Ans: who command & whoami

⇒ \$ who

chandresh tty7 : 2020-01-19 21:10 (:0)

⇒ \$ whoami

chandresh

⇒ \$ who -l

who: invalid opt LOGIN tty1 2020-01-19 21:10

⇒ \$ w

21:15:46 up 5 min, 1 user, load average: 0.20, 0.26, 0.14
USER TTY FROM LOGIN @ IDLE JCPU PCPU WHAT
chandresh tty7: 0 21:10 5:37 3.02s 0.13s /sbin/upstart

⇒ W - b s

20:35:14 up 4 min, 1 user, load average 0.60, 0.77, 0.37
USER TTY FROM IDLE WHAT
chandresh tty7: 0 4:38 /sbin/upstart - user

⇒ w - h

chandresh tty7: 0 20:32 4:44 0.67s 0.33s /sbin/pid

b) Display /etc/shadow file using cat command and understand file. How it's different than passwd file

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 char. case-sensitive, usually all lowercase. Direct match to the username in the /etc/passwd file.

- Password. 13 char encrypted. A blank entry (e.g.:) indicates a password is not required to log in. Usually a solid "x" and a "*" (e.g.: *) indicates the account has been disabled.

- The number of day (since Jan 1, 1970) since the password was last changed.

- The number of days before password may be changed.

- The no. of day after which password must be changed. (338) indicates user can keep his password for 338 days.

- The num of days to warn user of an expiring password.

- The num of days after password expires that account is disabled.

- The num of days since January 1, 1970 that an account has been disabled.

- A reserved field for possible future use.

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

- Username, up to 8 characters. Case-sensitive, usually lowercase.

```
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:~$ 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
jeba@jeba-VirtualBox:~$ w -h
jeba@jeba-VirtualBox:~$ w -h
jeba@jeba-VirtualBox:~$ w -f
jeba@jeba-VirtualBox:~$ w -f
20:36:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37
USER   TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
jeba   tty7      :0              20:32   5:36   9.00s  0.33s /sbin/upstart --user
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[judo] password for jeba:
root::18240:0:99999:7:::
daemon:*:16911:0:99999:7:::
bin:*:16911:0:99999:7:::
sys:*:16911:0:99999:7:::
sync:*:16911:0:99999:7:::
games:*:16911:0:99999:7:::
man:*:16911:0:99999:7:::
lp:*:16911:0:99999:7:::
mail:*:16911:0:99999:7:::
news:*:16911:0:99999:7:::
```

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:68:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
```

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06

REDMI NOTE 9 PRO

48MP QUAD CAMERA

```
jeba@jeba-VirtualBox:~$ pwd  
/home/jeba  
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ history  
1 who  
2 whoami  
3 who -l  
4 clear  
5 w  
6 w -s  
7 w -h  
8 w -f  
9 clear  
10 cat /etc/shadow  
11 sudo cat /etc/shadow  
12 clear  
13 sudo cat /etc/passwd  
14 pwd  
15 clear  
16 history  
jeba@jeba-VirtualBox:~$ !3  
who -l  
jeba@jeba-VirtualBox:~$ !  
LOGIN tty1 2020-01-15 20:30 780 id=tty1
```

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• Put "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: Redhat 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.
- User's home directory. Usually /home/username (e.g./home/smiti). All user's personal files, web pages, mail, download etc will be stored here.
- User's shell account: Often set to "/bin/bash" to provide access to the bash shell.

c) Get your current working directory
As pwd

d) Explore different way of getting command histy. How to do on previously executed command without typing it
As history

e) Create alias to most commonly used commands
Alias command instructs the shell to replace one string with another string while executing the commands.
As alias label="command".

Practical: 7

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REAR
CAMERA
48MP
OIS
VIDEO

Topic:- Linux Editors: Vi

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

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:

h

Action

Moves cursor up

j

Moves cursor down

k

Moves cursor left

l

Moves cursor right

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Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you

Hello
This is our Linux example
Welcome
Welldone
This is VI Editor
Thank you

Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you

:g/my/s//our/gc

Word Navigation.

Movement key

b
c
w
0
\$

Action
Moves back to the beginning of the word
Moves forward to the end of the word
Moves forward to the beginning of the word.
Move to first character of a line
move to the end of the

Scrolling

key

Ctrl+f
Ctrl+b
Ctrl+d
Ctrl+o

Action
Scrolls forward
Scrolls backward
Scrolls half page
Scrolls half page backward.

by learns all essential commands like search/replace, highlight, show the numbers.

i) Replace

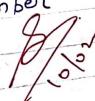
Syntax: :g /word to be replaced /s /new word /gc

ii) Highlight

User set hlsearch

iii) Show the line number

User set nu



Practical no: 8

Topic: Linux Security.

a) Use of sudo to change user privileges to root.

Create an user named user1

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

To give some users root privileges edit /etc/sudoers using visudo. Enter new line as highlighted below

```
# Please consider adding local content in /etc/sudoers.d/ instead of  
# directly modifying this file.  
# See the man page for details on how to write a sudoers file.  
  
Defaults env_reset  
Defaults mail_badpass  
Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/  
sbin:/bin"  
  
# Host alias specification  
# User alias specification  
# Cmnd alias specification  
  
# User privilege specification  
root    ALL=(ALL:ALL) ALL
```

b) Identify operations that require sudo privileges

```
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) Modify expiration date for new user using password aging.

```
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: ~$ 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
```

- 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 ~~a~~ newly added user.

8/10/2021

Practical:- 9

Topic: Network Management

a) Get IP address of your machine using ifconfig

```
jeba@jeba-VirtualBox:~$ ifconfig
enp0s3  Link encap:Ethernet HWaddr 08:00:27:0e:6b:69
        inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0
        inet6 addr: fe80::c0cd:5a0:ds3:848e/64 Scope:Link
              UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
              RX packets:2 errors:0 dropped:0 overruns:0 frame:0
              TX packets:73 errors:0 dropped:0 overruns:0 carrier:0
              collisions:0 txqueuelen:1000
              RX bytes:1180 (1.1 KB) TX bytes:8518 (8.5 KB)

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

b) Get hostname of your machine

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

56.

```
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
^Z
[1]+  Stopped                  ping www.google.com
```

d) Use of dig command

```
jeba@jeba-VirtualBox:~$ dig www.google.com
; <>> DIG 9.18.3-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: 127.0.0.1#53(127.0.0.1)
; WHEN: Mon Jan 20 22:40:06 IST 2020
; MSG SIZE rcvd: 59
```

f. Troubleshooting network using traceroute, route command.

```
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:~$ 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
```

f. Use of arp command

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

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g. Use of host command

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

h. Use of netstat command and Nmap command.

```
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/
unix  2      [ ]           DGRAM           9695   /run/systemd/journal/
syslog
unix  16     [ ]           DGRAM           9704   /run/systemd/journal/
dev-log
unix  7      [ ]           DGRAM           9684   /run/systemd/notify
socket
unix  3      [ ]           STREAM           CONNECTED  4642   @/tmp/dbus-CymTe17AQG
unix  3      [ ]           STREAM           CONNECTED  43331  @/tmp/dbus-CymTe17AQG
unix  3      [ ]           STREAM           CONNECTED  42988  @/tmp/dbus-CMGGc6G95
unix  3      [ ]           STREAM           CONNECTED  42690  @/tmp/dbus-CMGGc6G95
unix  3      [ ]           STREAM           CONNECTED  13242  /run/systemd/journal/
stdout
unix  3      [ ]           STREAM           CONNECTED  43113  /run/systemd/journal/
stderr
unix  3      [ ]           STREAM           CONNECTED  43013  /run/systemd/journal/
fd 10      [ ]           STREAM           CONNECTED  42935  /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): 2404.6800:4007:8111::2004
DNS record for 216.58.196.68: b0m05s11-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

Topic: D. 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 outputs 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 instructions to the program.

Echo \$SHELL

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

Chmod 777 filename.sh
./filename.sh

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

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

```
#!/bin/bash  
echo "Enter your name:"  
read name  
echo "My name is: $name"
```

```
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: ~ vi cs.txt  
tcsc@tcsc-VirtualBox: ~ sed -n 3,5p cs.txt  
database management  
linux  
python
```

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

```
tsc@tsc-VirtualBox: ~ vi ubuntu.sh
tsc@tsc-VirtualBox: ~ chmod 777 ubuntu.sh
tsc@tsc-VirtualBox: ~ ./ubuntu.sh
```

Enter your name:

TANVI

Name is: TANVI

```
tsc@tsc-VirtualBox: ~ vi lin.sh
tsc@tsc-VirtualBox: ~ chmod 777 lin.sh
tsc@tsc-VirtualBox: ~ ./lin.sh 50 70
Sum is:120
```

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

"lin.sh" 3 lines, 46 characters

⇒ Step to write and execute a shell script.
Shell script is just a simple txt 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 file name .sh

d) Vi filename.sh { You can use your favorite editor to edit the script }

e) chmod 777 filename.sh

f) sh file name.sh or ./filename.sh

Program to script display your name

#!/bin/bash

Echo "Enter your name:"

Echo "My name is: \$name"

Program to find the sum of two variables

vi 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 system. 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.

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

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

- 1.) Display partial text of a file.
With sed, we can view only part of a file rather than seeing whole file.
- 2.) Display all except some lines
To display all content of a file except for some portion, use option 'd'.

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

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

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

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

- 3) Deleting a line.
To delete a line, use line number followed by 'd'.
- 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/before the matched string
To add a new line with some content after every pattern match, use option 'a'.
- 7) To add a new line with some content before every pattern match use option 'i'.
- 8) To change a whole line to new line with matched pattern
To change a whole line to a new line when a search pattern match use option 'c'.
- 9) Appending lines
To add some content before every line with use * & end \$ as follows.