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Practical No. 1

Aim:-

i) Install your choice of linux distribution eg:- Ubuntu, fedora

ii) Customize desktop environment by changing different default options like changing default background, themes screen savers.

iii) Screen resolution

iv) Time settings

linux installations :-

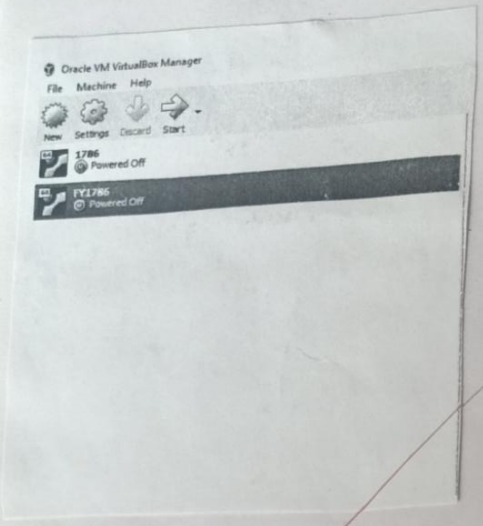
Install your choice of linux distribution eg; Ubuntu, Fedora, Debian, Using a USB device.

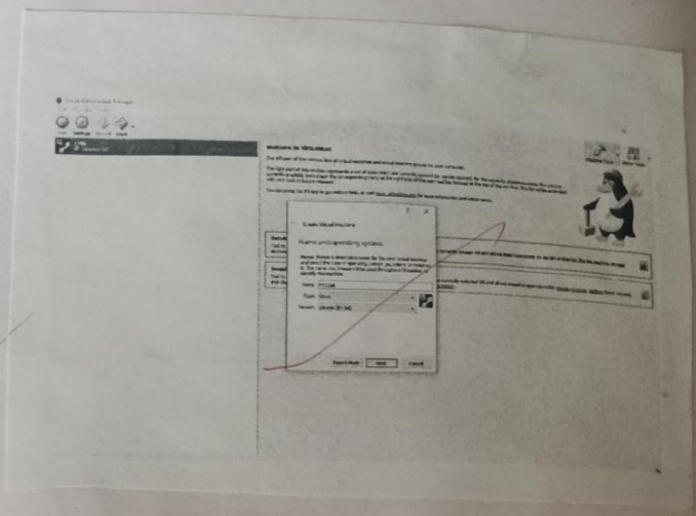
a) Most newer computer can boot from USB. You should see a welcome screen prompting you to choose your language & guiding you the option to install Ubuntu or try it from the USB

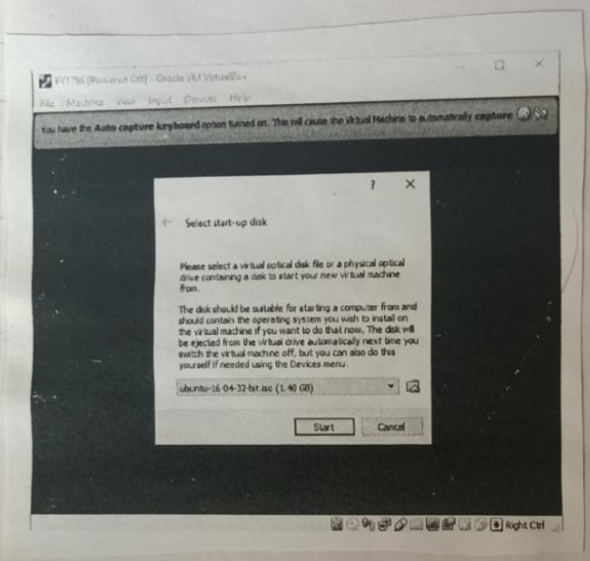
b) if your computer doesn't automatically do so, you might need to press the F12 key to bring up the boot menu, but be careful not to hold it that can cause an error message.

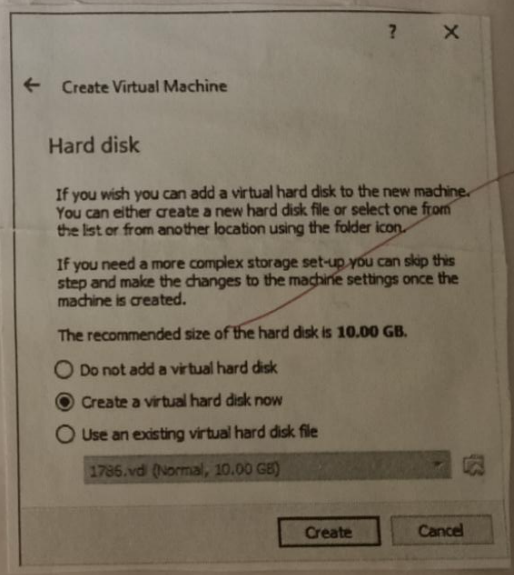
1) Prepare to install ubuntu :-

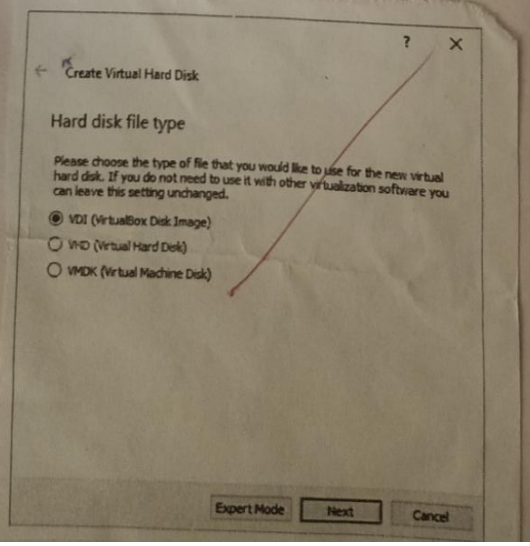
* We recommend you to plug your computer into a power source
* You should also make sure you have enough space on your computer to install ubuntu.
* We advise you to select download updates while installing and install this third party software now

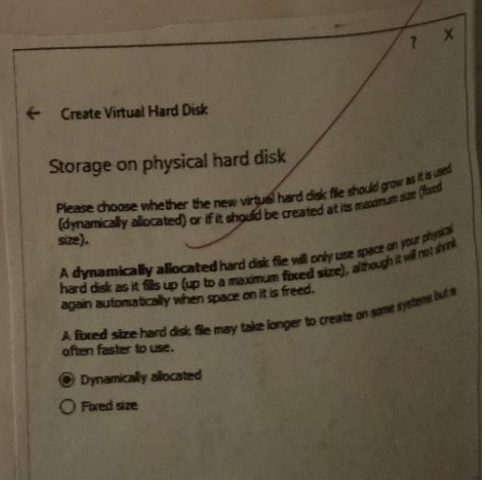

Oracle VM VirtualBox Manager
File Machine Help
New Settings Discard Start
1786
Powered Off
FY1786
Powered Off




Select start-up disk
Please select a virtual optical disk file or a physical optical drive containing a disk to start your new virtual machine from.
The disk should be suitable for starting a computer from and should contain the operating system you wish to install on the virtual machine if you want to do that now. The disk will be ejected from the virtual drive automatically next time you switch the virtual machine off, but you can also do this yourself if needed using the Devices menu.
ubuntu-16-04-32-bit.iso (1.40 GB)
Start
Cancel
Right Ctrl


Create Virtual Machine
Hard disk
If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.
If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.
The recommended size of the hard disk is 10.00 GB.
Do not add a virtual hard disk
Create a virtual hard disk now
Use an existing virtual hard disk file
1786.vdi (Normal, 10.00 GB)
Create
Cancel


Create Virtual Hard Disk
Hard disk file type
Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.
VDI (VirtualBox Disk Image)
VHD (Virtual Hard Disk)
VMDK (Virtual Machine Disk)
Expert Mode
Next
Cancel


Create Virtual Hard Disk
Storage on physical hard disk
Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).
A dynamically allocated hard disk file will only use space on your physical hard disk as it fills up (up to a maximum fixed size), although it will not shrink again automatically when space on it is freed.
A fixed size hard disk file may take longer to create on some systems but is often faster to use.
Dynamically allocated
Fixed size

* You should also stay connected to the inter so you can get the latest updates while you install Ubuntu.

* If you are connected to the internet so you can get the latest ~~soft~~ updates while wireless network, if available. We advise you to connect during the installation option so we can ensure your machine is upto date

2] Allocate device space:-

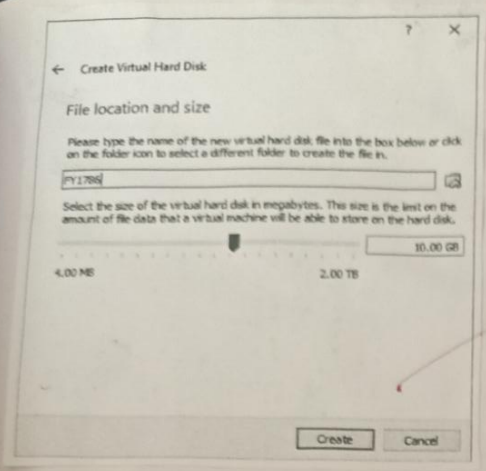
* Use the checkboxes to choose whether had like to install ubuntu alongside anot operating system, delete your existing opera system & replace it with ubuntu, or if you are an advanced user choose the so else' option.

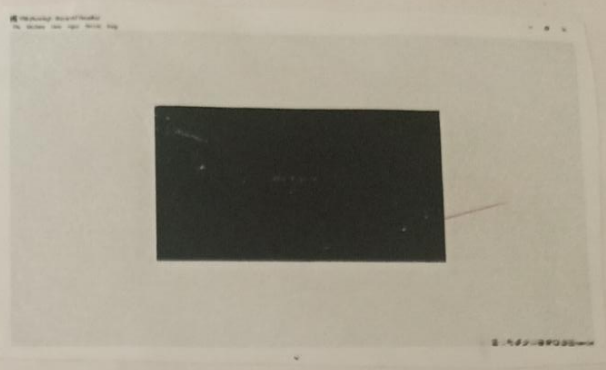
3] Begin the installation:-

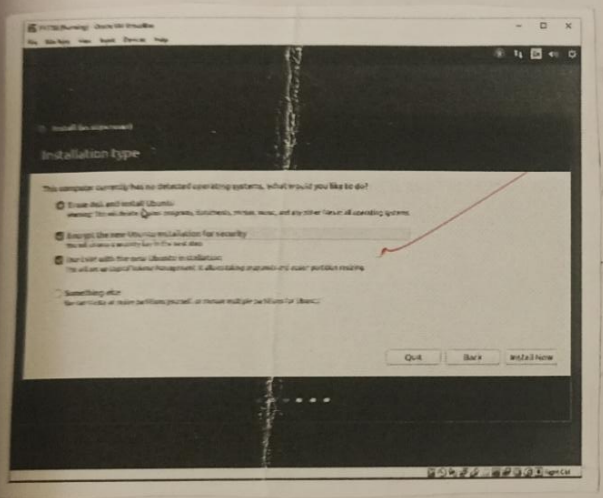
* Depending on your previous selections, y can now verify that you have chosen th in which you would like to install ubun

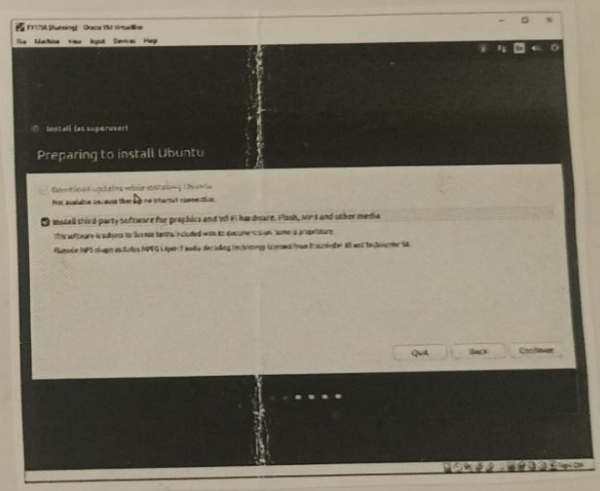
* The installation process will begin when you cli install Now button

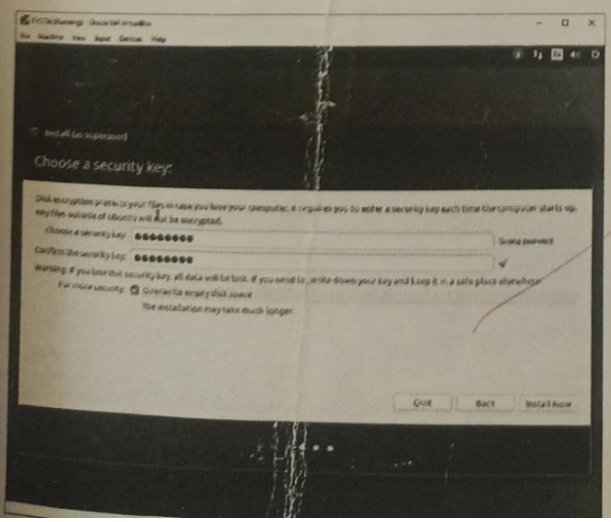
* Ubuntu needs about 4.5 G a few gigs

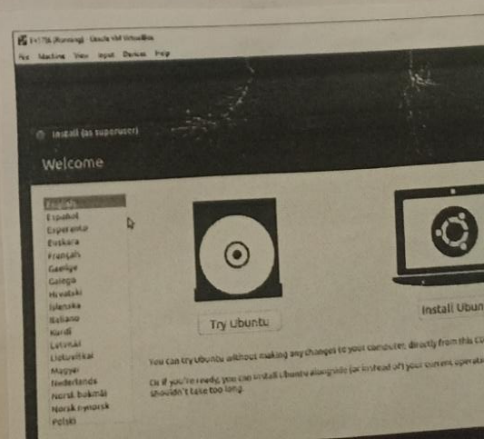

Create Virtual Hard Disk
File location and size
Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.
FY1786
Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.
10.00 GB
4.00 MB
2.00 TB
Create
Cancel

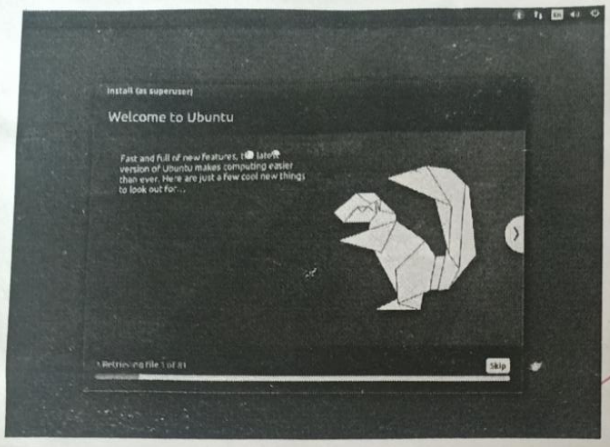


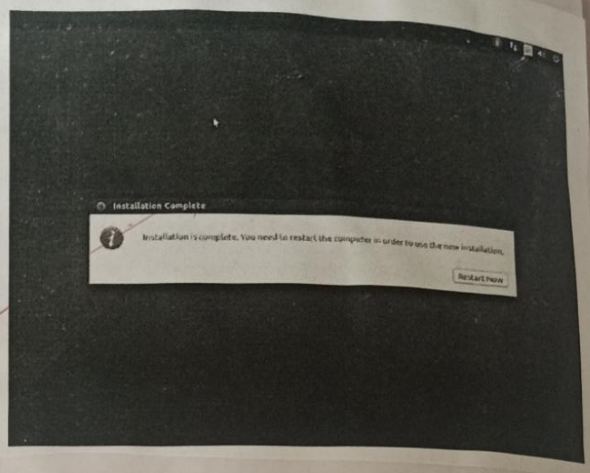

Installation type
Quit
Back
Install Now

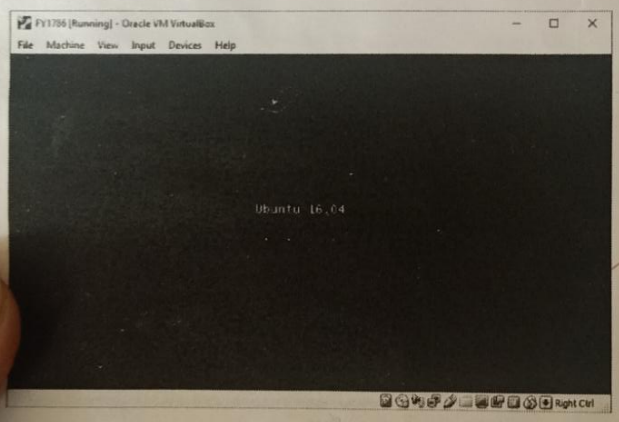

Preparing to install Ubuntu
Quit
Back
Continue


Choose a security key:
The installation may take much longer.
Quit
Back
Install now


Welcome
Try Ubuntu


Install (as superuser)
Welcome to Ubuntu
Fast and full of new features, the latest version of Ubuntu makes computing easier than ever. Here are just a few cool new things to look out for...
Retrieving file 1 of 81
Skip


Installation Complete
Installation is complete. You need to restart the computer in order to use the new installation.
Restart now


FY1786 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Ubuntu 16.04
Right Ctrl

4] Select your location:-

* if you are connected to the internet, this should be done automatically. Check your location is correct & click 'forward' to proceed. if you are unsure of your time zone, type the name of the town you are in or click on the map we will help you find it.

* Tip:- if you are having problems connecting to the Internet, The menu is the right hand corner to select a network

5] Select your preferred keyboard layout:-

* Click on the language option you need. if you're not sure, click the detect keyboard layout 'button for help

6] Enter your login & password details

7] learn more about Ubuntu while the system installs

8] Thats it:- All that's left is to restart your computer in order to use the ubuntu.

22/01

Practical No.:- 2

Aim:- Installing & removing software

a] Install gcc package, verify that it runs & then remove it.

Step1:-
first type 'gcc-v' to know if you have already installed gcc compiler or not if the output is blank then it means that you dont have gcc installed.

Step2:-
The 'sudo - apt-get install gcc.' After typing the following command installation will take place

Step3:-
Type 'sudo apt-get install build-essential This will install all the libraries required for C & C++ programming language

Now to uninstall GCC compiler:-

In GCC compiler 5.1.0, although there is no Cop-land uninstall target, some directories 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 majorly executable like gcc, g++, cpp... contained in that directory.

22/01

Practical No:- 3

Aim:- Utilization of grep, man commands.

Documentation:-

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

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 'group' command;

open the terminal (Ctrl+ Alt+ T)
type: info grep

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

You can also scroll through pager using (space: up) & (Backspace: down) keys.

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

b] finding man pages from the cmd line: Bring up the man page for the 'ls' command. Scroll down to the examples section.

Ans:- To use the 'man' commands 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

Ans:- 'Tar', 'zip' are some man pages which are available for document file compression

simply type: man zip
man tar.

Tar (1)

Name

tar - an archiving utility

Synopsis

Traditional usage

tar {A|C|d|r|t|u|x}[GnkuWno pqz] [ARG...]

Unix-style usage

tar - A [OPTIONS] ARCHIVE ARCHIVE

tar - c [-f ARCHIVE] [OPIONS] [FILE..]

tar - d [-f ARCHIVE] [OPTIONS] [FILE ...]

tar -t [-f ARCHIVE] [OPIONS] [MEMBER...]
tar -x [-f ARCHIVE] [OPTIONS] [FILE...]
tar -u [-f ARCHIVE] [OPTIONS] [FILE...]
tar -x [-f ARCHIVE] [OPIONS] [MEMBER]

GNU style usage

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

9] finding man pages by section from the condition bring up the man page for the printf lib function which manual page section one library function found.

Ans:- The number corresponds to what section of the manual page is from; 1 is user commands while 8 is sysadmin stuff; ~~1 is~~ The man page for man itself. explain it & list the standard output.

8/2/20

MANUAL SECTIONS

The standard sections of the manual include:-

1. User commands
2. System calls
3. Library functions
4. devices and special files
5. file formats and conventions
6. Games etc.
7. Miscellanea
8. System Administration tools and Daemons

There are certain terms that have different pages in different sections (eg. printf 'a command appears in section 1. as a 'std lib' function appears in section 3); in cases like that you can pass the section no. to the man before the page name to choose which one you want or use man -a to show every matching page in a row

$man 1 print

$man 3 print

$man -a printf

$ man -k 'printf'

printf (1) - format and print data

printf (1p) - write formatted output

printf (3) - formatted output conversion

You can tell what section a term falls in with man. (equivalent to appropriate command). it will g substring matches too. So you need to use f

Practical No:- 4

Command line operator:

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 password file in / using find com

find / -name password

- /usr/share/doc/nss_/db2-253/pa
/password

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

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

find / -max depth 2 -name passwd
- /etc/passwd

find the passwd file under root and 2 level d
find / -mindepth 3 -name passw

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

find the password file b/w sub-directories level 2 to 4

find - maxdepth 3 - mindepth 5 - name
./usr/bin/passwd
./etc/pam.d/passwd

d) Create a symbolic link to the file 4 on found in dest direp.

ln -s file1 file2

e) Create an empty file example.txt & move it to \tmp directory using relative pathname

touch example.txt
mv example.txt /tmp

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

rm /tmp/example.txt

9) find the location of ls, ps, bash commands

whereis ls

ls: /bin /ls /usr /share /man /man1 /ls.1.gz

where is ps

ps: /bin /ps /usr /share /mps: /bin /ps /usr /share

man /man1 /ps.1.gz

where bash

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

man /man1 /bash.1.gz

22/01

Practical 5

1. Explore mounted file systems 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             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
jeba@jeba-VirtualBox:~$
```

2. What are the different ways of exploring mounted file systems on linux?

Ans:- mount

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=494436k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=102416k,mode=755)
/dev/sda1 on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,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,relatime,xattr,releas
e_agent=/lib/systemd/systemd-cgroups-agent,name=systemd,nsroot=/)
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot
=/)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net
_cls,net_prio,nsroot=/)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=/)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsro
ot=/)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpua
cct,nsroot=/)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsro
ot=/)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot
=/)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsroot=/
)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_even
t,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsro
ot=/)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=0,minp
roto=5,maxproto=5,direct)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

3. Copying text from files.

Ans:- cp command, mv command

```
jeba@jeba-VirtualBox:~$ ls
Desktop     Downloads          jeb   Music     Public     Videos
Documents   examples.desktop   jj    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
jeba@jeba-VirtualBox:~/jeb$ cat >gg.txt
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

Ans:- gzip filename.txt Bzip2 filename.txt

```
jeba@jeba-VirtualBox:/$ tar -cvf data.tar /mnn
tar: data.tar: Cannot open: Permission denied
tar: Error is not recoverable: exiting now
jeba@jeba-VirtualBox:/$ sudo tar -cvf data.tar /mnn
tar: Removing leading '/' from member names
/mnn/
/mnn/hd/
jeba@jeba-VirtualBox:/$ ls
bin   data.tar  etc         lib         mnn   opt   run   srv  usr
boot  dd        home        lost+found  mnt   proc  sbin  sys  var
cdrom dev       initrd.img  media       mnt1  root  snap  tmp  vmlinuz
jeba@jeba-VirtualBox:/$ cat data.tar
mnn/0000755000000000000000000000000000013605376557010365 5ustar  rootrootmnn/hd/0000755000000000
000000000000000000013605376557010760 5ustar  rootrootjeba@jeba-VirtualBox:/$
```

```
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]◆[illegible]
'J◆w$S◆◆[illegible]1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
◆[illegible]d.txt+O◆I◆◆M◆◆◆◆+◆◆[illegible]◆Xzjeba@jeba-VirtualBox:~/jeb$
```

5. Use diff command to create diff of two files

Ans:- diff filename1 filename2

```
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat >aa.txt
hello world
^C
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is linux^C
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
1d0
< hello world
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is Linux
^C
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
1c1
< hello world
---
> this is Linux
jeba@jeba-VirtualBox:~/jeb$ gzip aa.txt
jeba@jeba-VirtualBox:~/jeb$ gzip bb.txt
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt.gz bb.txt.gz
Binary files aa.txt.gz and bb.txt.gz differ
```

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$
```

25/02

Practical 6

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 under the importance of shadow file. How it's different than passwd file

Ans: cat/etc/shadow

As with the passwd file, each field in the shadow file is also separated with ":" colon character & are as follows

- Username upto 8 characters, case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.
- Password, 13 characters encrypted. A blank entry (eg:: indicates a password is not required to log in, a "*" entry (eg: *:) indicates acc. been disabled
- The number of days since the password changed
- number of days before password may be changed
- Number of days after which user will be warned for expiring password
- Number of days after which password will disappear

Number of days since the account has been disabled.

A reserved field for possible future use.

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] 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:::
```

Each field in a password 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 file "/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 user.
- Numeric group id. Read that user group ids in a fairly unique manner for file security
- Full name of user. I'm not sure what the max. length for this
- User home directory. Usually /home/ username. All user personal files, web pages

```
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:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
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
```

c) Get your current working directory
Ans: pwd

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

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

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

c) Create alias to most commonly used commands.

Ans:- alias label= "command"

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

05/02

Pratical - 7

a) Create, modify, search & 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 prefix / followed by the word to search.

iv) Navigate: move in 4 directions

Key	Action
k	move cursor up
j	move cursor down
h	move curser left
l	move cursor right

Word Navigation

key	Action
b	Moves back to beginning of the word
e	Moves forward to end of the word
w	Moves forward to the begining of word
0(zero)	Moves to first character of line
$	Moves to end of line

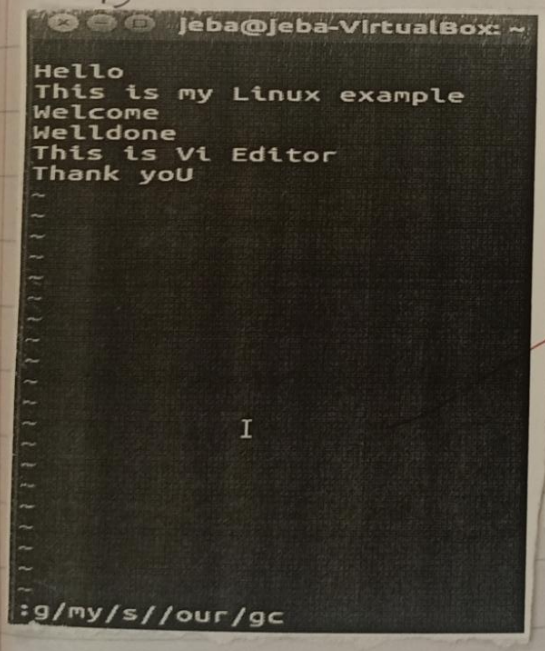
scrolling

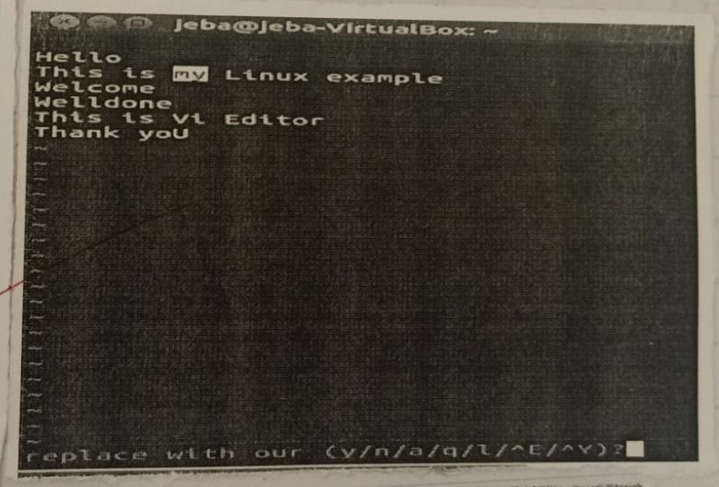
Key	Action
ctrl + f	scroll forward
ctrl + b	scroll backward
ctrl + d	scroll half page
ctrl + u	scroll half page backward.

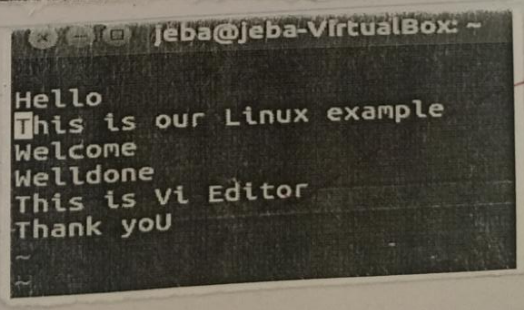
learn all essential commands like search/replace, highlight, show line numbers.

i) replace

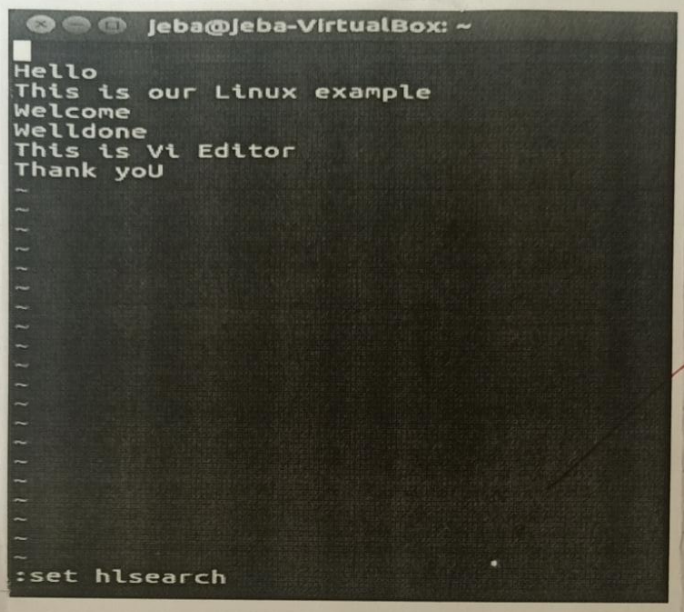
syntax: /g/ word to be replaced/s//new word/g



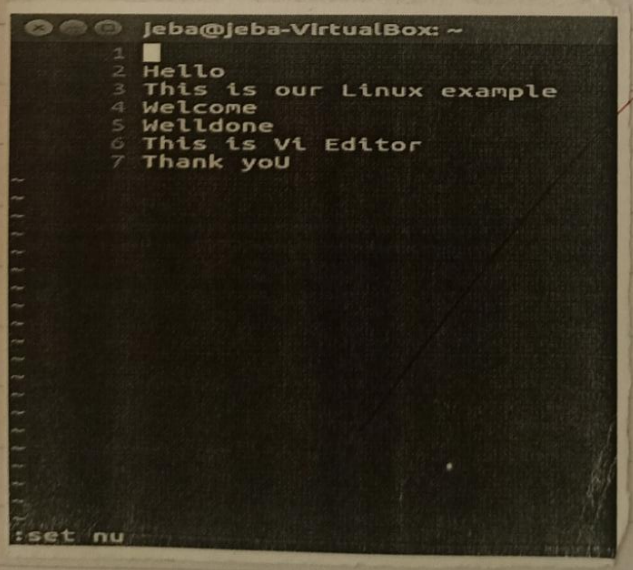




ii) Highlight
Use set hlsearch



iii) show the line number
Use set nu



05/02

Practical - 8

a) Use of sudo to change user privileges to root.
Create an user named user1

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

To give some 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: ~
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
```

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

```
jeba@jeba-VirtualBox:~$ su user1
Password:
user1@jeba-VirtualBox:/home/jeba$ mkdir folder1
mkdir: cannot create directory 'folder1': Permission denied
```

```
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 : Min number of days before passwd change
- M : Number of days
- I : Account inactive
- W : Number 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:~$
```

03/02

Practical - 4

1) 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 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)
```

2) Get host name of your machine

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

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=
97.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=
82.0 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=
84.8 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=
87.1 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=
93.5 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=
86.9 ms
64 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=
98.0 ms                                                  icmp_seq=8 ttl=54 time=
```

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.

```
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

```
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

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

) use of netstat command and Nmap comm


```
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:~$
```

```
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/systemd/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     44042    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     43331
unix  3      [ ]         STREAM     CONNECTED     42988    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     42690    @/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
```

08/02

Practical No.:- 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) 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 & it passes the instruction to the prog.

Echo $Shell

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

- vifilename.sh

```
#!/bin/bash
echo "This is linux"
```

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

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

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

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

steps to write & execute a shell script.

- Shell script is just a simple text file with sh extension, having executable perm

a) open terminal
b) Navigate to the place where you want to create win
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
```

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

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

Program to find the sum of two variables

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

```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
a=100
b=25
sum=$(($a+$b))
echo "Sum is:$sum"
~
:wq
```

```
tcsc@tcsc-VirtualBox: ~
tcsc@tcsc-VirtualBox:~$ vi linux2.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 linux2.sh
tcsc@tcsc-VirtualBox:~$ ./linux2.sh
Sum is:125
tcsc@tcsc-VirtualBox:~$
```

(Program to find the sum of two numbers)

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

```
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 manipulation.

Consider the following text file:-

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

1) Display the partial text of a file with Sed, we can only view partial part of a file

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

2) Display all except some lines
To display all content of a file except for some

```
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 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
```

5) Replace a string on a partial line
To replace a string on a particular line using 's' command.

```
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) Add a line after / before the matched string.
To add a newline with some content after every pattern match, use opt 'a'

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

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

```
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
```

```
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
```

7) To change a whole line with matched pattern.
To change a whole line to a new line use option 'c'

```
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
```

8) Appending lines
To add some content before every line with sed, use * and & or follows

24/02