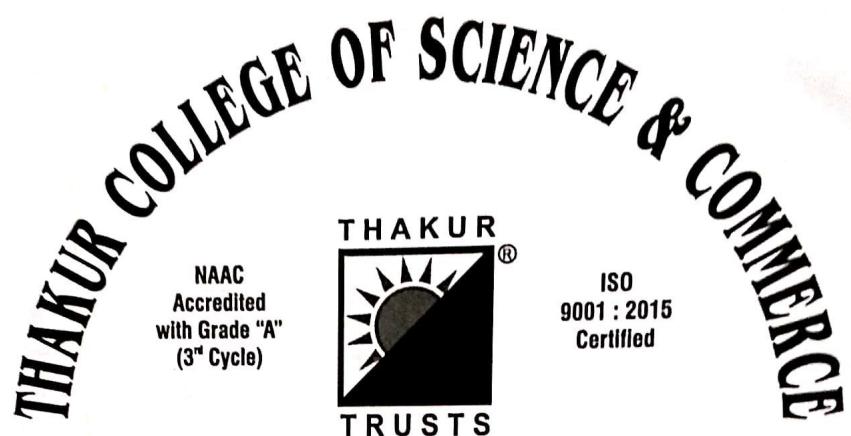


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(3<sup>rd</sup> Cycle)

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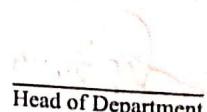
SEMESTER II UID No. \_\_\_\_\_

Class FYBSC Roll No. 1258 Year 2020

This is to certify that the work entered in this journal  
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who has worked for the year 2020 in the Computer  
Laboratory.

  
Teacher In-Charge

  
Head of Department

Date : \_\_\_\_\_

Examiner

**INDEX**

### PRACTICAL-1

i) Install your choice of Linux distribution e.g. Ubuntu, Fedora, Debian.

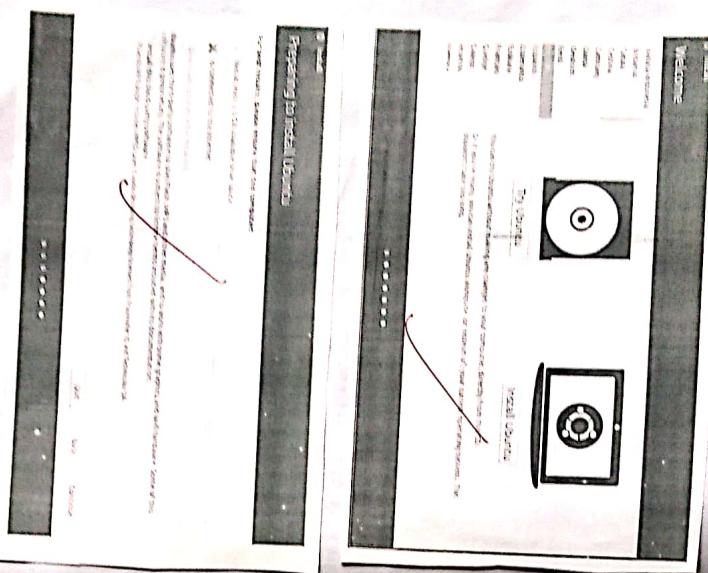
Steps for installing ubuntu in a virtual machine

Step 1 :- Select a virtual machine option disk file or a physical drive. to start ubuntu in your virtual machine . steps given to it is like as

Step II : Sett the language of your choice and click on install ubuntu. You can also by ubuntu for free on computer drive from this CD.

Step III : for Updation and Add software click on the Normal Installation

Step IV :- while configuring installation type we need to click Erase Disk and Install Ubuntu. This step would delete all type of doc, photo etc in all operating system.



Step 8 : In this you only need to choose the location. So the book to be work on .ubuntu

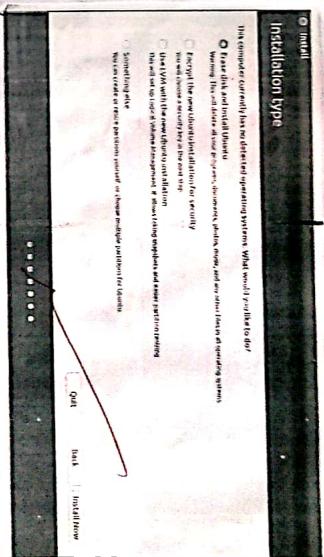
Step 9 : In this type you need to choose username and password for the login in ubuntu & then click on continue.

Step 10 : Here here you simply need to type password again and it is done.

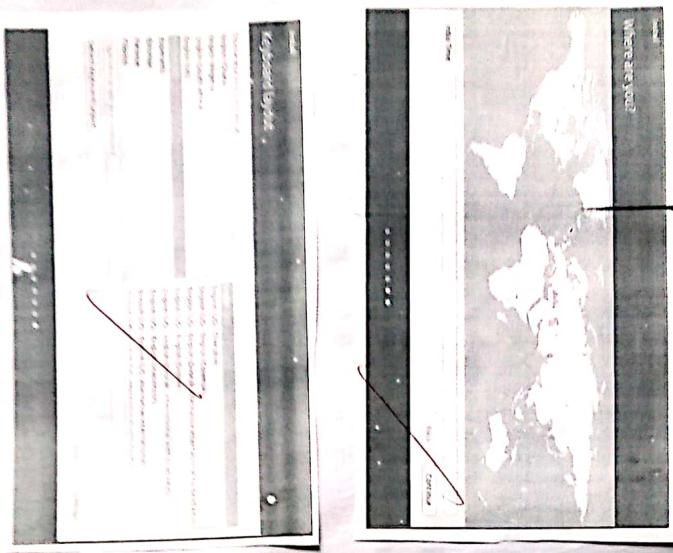
Customize desktop environment by choosing different default options etc changing default background, themes, screensavers.

(A) Accessing Appearance setting  
1. To access Appearance Setting in ubuntu, let click on the menu at the top right corner on the top menu bar and select system settings.

2. A window will pop-up with All settings divided into Powerwall, Hardware and System option Icons. Lets just select Appearance Icon.



### (B) Changing wallpaper Picture.



1. On the left side of Background part, you can see your current wallpaper.
2. On the right side part where we can select one of windows wallpaper.
3. If you want to select wallpaper from your picture folder click the drop-down menu above thumbnails and select Picture folder.
4. You will see all pictures in your picture folder or thumbnails (where you can select them as your wallpaper).
5. To add wallpaper just check the plus icon below the thumbnails and then open window select the path to your own folder and choose the picture inside it.
- (i) Changing windows theme.
6. Windows has an option to change the desktop theme, which in one click will change the entire way your windows looks.

Ex.

2. To the track which on the road cloudy  
rainy, before the wind paper, and chose  
between Auditing, evidence, or high  
confidence

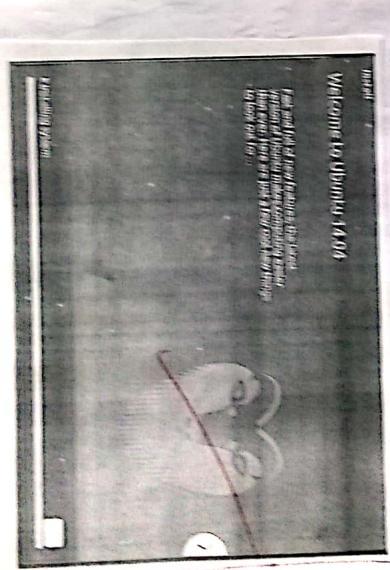
3. Auditing is a right, during that  
leads to let more time like, while  
Auditing is the better, than there  
was in return, by default

b) Change the size or rotation, of the  
screen

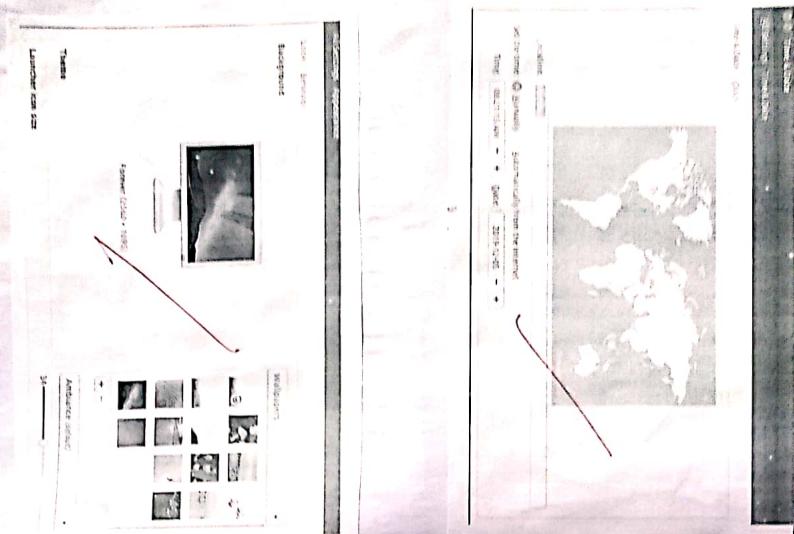
1. You can change how big the things  
appear on the screen by changing  
resolution.

2. You can change with what the height  
appear by changing the resolution.  
if click, you can on the very right, of  
the menu bar and select screen  
setting.

c) after install, display,



3B



(ii) select your desired resolution and rotation.

Click apply.

That way it you can see anything with new.

(c) Time setting change the time zone of your system.

i. If you are currently in Indian time

New does display time change.

ii. After nothing the time change, change the time zone back to your local time.

For -

Just click on the clock on the top bar, and choose time and date setting, once the time and date window opens, choose the time and date manually so you can change the time zone back to your local time.

10/27/10

## PRACTICAL - 2

AIM :- Installing and removing software.

(A) Install all 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.

(B) Now to uninstall ~~gcc compiler~~ compiler :-

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

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

~~10/20/11~~

## PRACTICAL - 3

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AIM :- utilization of group , man commands

Documentation :-

a. Finding info documentation from the command line : bring up the info page for the group command. Bring up the usage section

Ans:- To find info about any command info command is used.

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) and type:

info group

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, 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' command simply type 'man [command name]'  
Now we are going to bind the manual for it '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 tar

d] Finding man pages by section from the cmd line bringing up the man page for the point of lib function which manual page section are library function found.

Ans :- The number corresponds to what section of the manual page is boom; if user command, while & u sys admin about. The man page for man itself explain it and w/ the std 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); in case like that you can pass the section no. to the man before the page name to choose which on you want or use man a to show every matching page in a row.

You can tell what section a file from falls in with 'man -k' (equivalent to apropos command). It will do substring matching too so you need to use " from " to limit it.

e) Command-line help list the available options for the mkdir command. How can you do this?

\$ mkdir -m a=xxx directoryname

10/10/1

PRACTICAL - 4.

*Mr. Leonard W. Clegg*

Will run package on your system

120. opt - get. now! Passage. now!

is more the message restored.

1955: oft - get misuse language more

kind etc. passed by in using kind words  
etc. kind / once passed  
over stories / etc. from / dip. etc. / passed  
use / etc. / passed  
etc. I passed / passed  
etc. I passed / passed.

It is difficult to say for certain what

~~11~~ David Morris  
find more opportunities now.

*Red* *the* *colored* *the* *order* *red* *and* *is* *not* *blue*

Ward, Newmarket, same potno.

1st, 1 found 1 ratad.  
1st, 1 ratad.

*18/01*  
bash : /bin /bash /etc / bash . bashrc /usr /share /  
man /man / bash . 1 . gz . 4B

Find the password file b/w sub-directories level  
2 q 4  
# find - maxdepth 3 - maxdepth 5 - name passwd  
• /user /bin /passwd  
• /etc /passwd /passwd

d) Create a symbolic link to the file you found

in last step.  
# ln -s .bin /file2 .

e) Create an empty file .example .txt & move  
it to /tmp directory using relative path name  
# touch example.txt /tmp  
# mv example .txt /tmp

f) Delete the file moved to /tmp in previous step  
by absolute method  
# rm /tmp /example.txt

g) Find the location of ls , ps , bash commands  
# whereis ls

ls : /bin /ls /usr /share /man /man /ls . 1 . gz  
# whereis ps

ps : /bin /ps /usr /share /mans : /bin / ps /usr /ls  
man /man / ps . 1 . gz

# Whereis bash

## PRACTICAL 5

**TOPIC : File Operations**  
**Explore mounted file system on your computer**

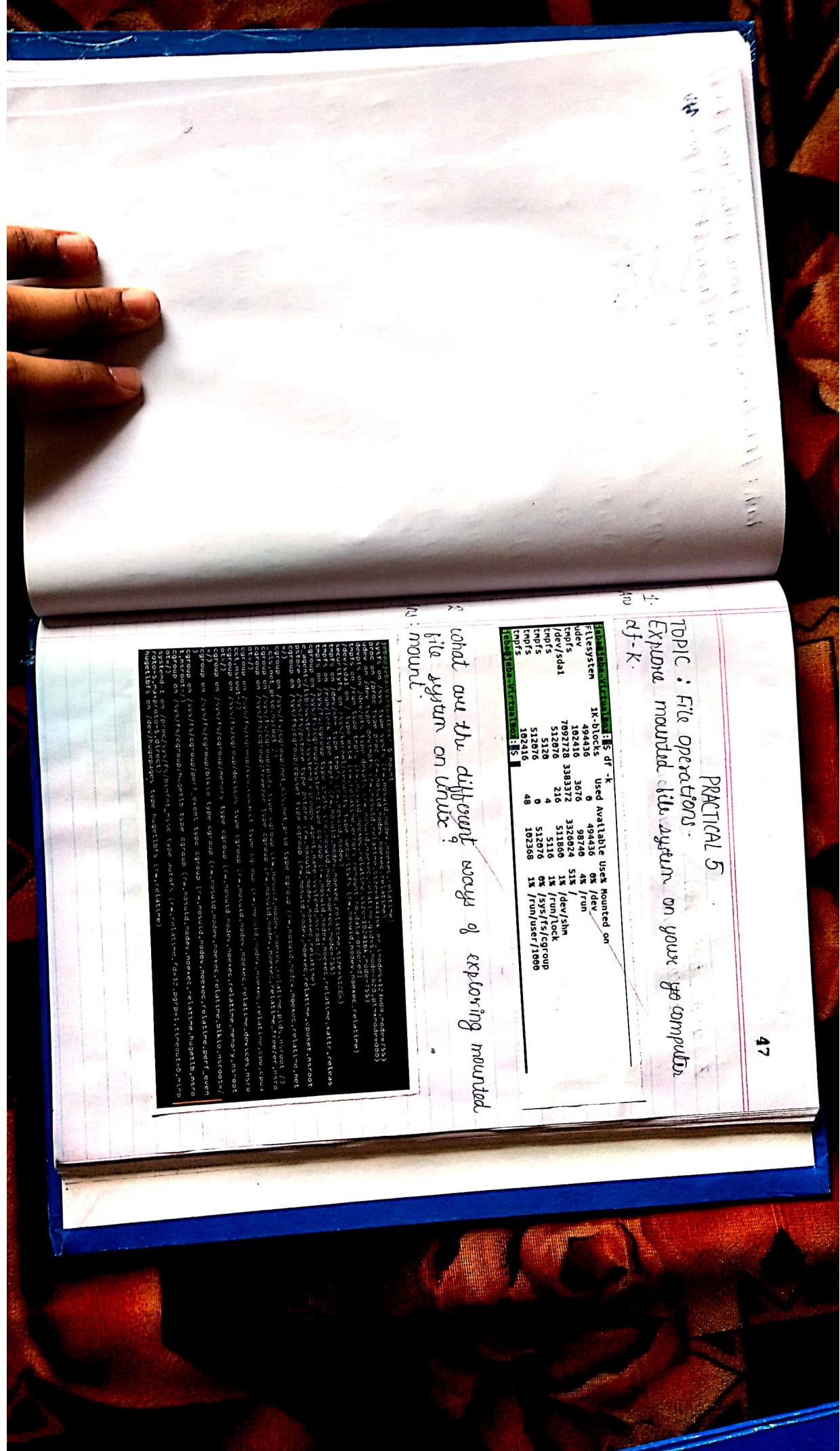
Q1.

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
udev	494436	0	494436	0%	/dev
tmpfs	182416	3676	88740	4%	/run
/dev/sda1	7092728	3383372	3326624	51%	/dev/sda1
tmpfs	5120	216	5116	1%	/dev/shm
tmpfs	4	0	5120	0%	/run/lock
tmpfs	5120	0	5120	0%	/sys/fs/group
tmpfs	102416	48	102368	1%	/run/user/1000
tmpfs	102416	48	102368	1%	/run/user/1000

Q2. what are the different ways of exploring mounted file system on Unix?

Ans:

1. Using df -k command  
     \$ df -k  
     Filesystem 1K-blocks Used Available Use% Mounted on  
     udev 494436 0 494436 0% /dev  
     tmpfs 182416 3676 88740 4% /run  
     /dev/sda1 7092728 3383372 3326624 51% /dev/sda1  
     tmpfs 5120 216 5116 1% /dev/shm  
     tmpfs 4 0 5120 0% /run/lock  
     tmpfs 5120 0 5120 0% /sys/fs/group  
     tmpfs 102416 48 102368 1% /run/user/1000  
     tmpfs 102416 48 102368 1% /run/user/1000



3. Copying text from file.

jeb@jeb:~\$ touch ss.txt  
jeb@jeb:~\$ ls -l  
total 0  
jeb@jeb:~\$ cat gg.txt ss.txt  
cat: gg.txt: No such file or directory  
jeb@jeb:~\$ cat ss.txt  
Welcome  
Linux

4. Archiving and backup the work directory using tar, gzip and zip2 commands..  
And: `gzip -v workdir.txt`  
`zip2 workdir.txt`

5. We diff command to create diff of two files.  
Ans : diff filename1 filename2

```
jebab@jeba-VirtualBox:~/Jobs$ ls
aa.txt bb.txt
jebab@jeba-VirtualBox:~/Jobs$ cat >aa.txt
Hello world
jebab@jeba-VirtualBox:~/Jobs$ cat >bb.txt
this is Linux
jebab@jeba-VirtualBox:~/Jobs$ diff aa.txt bb.txt
< Hello world
< this is Linux
jebab@jeba-VirtualBox:~/Jobs$ cat >bb.txt
Hello world
jebab@jeba-VirtualBox:~/Jobs$ diff aa.txt bb.txt
1c1
< Hello world
> this is Linux
jebab@jeba-VirtualBox:~/Jobs$ gzip aa.txt
jebab@jeba-VirtualBox:~/Jobs$ gzip bb.txt
jebab@jeba-VirtualBox:~/Jobs$ diff aa.txt.gz bb.txt.gz
Binary files aa.txt.gz and bb.txt.gz differ
```

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

```
jebab@jeba-VirtualBox:~/Jobs$ cat >ht.txt
Hello world
jebab@jeba-VirtualBox:~/Jobs$ cat >htt.txt
Hello world
jebab@jeba-VirtualBox:~/Jobs$ diff -u ht.txt htt.txt >sam.patch
jebab@jeba-VirtualBox:~/Jobs$ patch -s sam.patch
jebab@jeba-VirtualBox:~/Jobs$ patch < sam.patch
patching file ht.txt
patching file htt.txt
2020-01-08 22:14:55.46369938 +0530
+++ ht.txt 2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-Hello world
+Hello world
+jebab@jeba-VirtualBox:~/Jobs$
```

16/01

三

TABLE : THE Environment.

卷之三

alcohol account you are logged in.  
kind out.  
Ans: who command & who am i

b) Display /etc/sladow file using cat command  
and understand the importance of shadow file .  
Now it is different than passwd file .  
Ans : cat /etc/sladow .

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

- **welcome**, up to 8 characters. case sensitive, usually all lowercase. A client needs to type the welcome in the ~~left~~ **password** field.
  - **password**, 13 character required. A blank entry (eg.:) indicates a password is not required to log in (usually a bad idea), and a "X" entry (eg.:\*) 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 password may be changed (0 indicates it may be changed at any time).

(a)

[2]

(b)

```
[root@jebaga-pc-VirtualBox: ~]# sudo cat /etc/shadow
root:$1$16911$6199999977::0:99999:7:::
bin:$1$16911$6199999977::0:99999:7:::
sync:$1$16911$6199999977::0:99999:7:::
sys:$1$16911$6199999977::0:99999:7:::
adm:$1$16911$6199999977::0:99999:7:::
lp:$1$16911$6199999977::0:99999:7:::
mail:$1$16911$6199999977::0:99999:7:::
news:$1$16911$6199999977::0:99999:7:::
```

(b)

```
[root@jebaga-pc-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:2:1:bin:/bin:/bin/nologin
sys:x:3:1: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/spool/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:MailList Manager:/var/list:/usr/sbin/nologin
```

- The number of days after which password must be changed ( 99999 indicates user can keep his or her password unchanged for many, many years)
- 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 password entry is separated with ":" colon characters, and are as follows :
- Username , upto 8 characters . case - sensitive , usually all lowercase .
- An "X" in the password field . Passwords are stored in the ~~/etc/shadow~~ file .
- Numeric user id . This is assigned by the "adduser" script . Uniqueness 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 ).

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- User's home directory usually has no password (e.g. /home/johnny), but most personal files, web pages, email forwarding, etc., will be stored here.
- User's "shell account". Often set to "bin/bash" to provide access to the basic shell (by password, password shell).

c) Get your current working directory.  
Ans : /root

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

Ans: history  
line number.

e) Create alias to most commonly used commands. Alias command rebuilds the shell to replace one string with another during shell while executing the command.

Ans: alias ls='ls -l'

(d)

jehan@jehan-VirtualBox:~\$ history

```
1 whoami
2 whoami
3 whoami
4 clear
5 w -h
6 w -f
7 w -h
8 cat /etc/passwd
9 cat /etc/passwd
10 sudo cat /etc/passwd
11 sudo cat /etc/passwd
12 clear
13 clear
14 history
```

jehan@jehan-VirtualBox:~\$ 13

14

```
jehan@jehan-VirtualBox:~$ history
1 whoami
2 whoami
3 whoami
4 clear
5 w -h
6 w -f
7 w -h
8 cat /etc/passwd
9 cat /etc/passwd
10 sudo cat /etc/passwd
11 sudo cat /etc/passwd
12 clear
13 clear
14 history
jehan@jehan-VirtualBox:~$ 13
jehan@jehan-VirtualBox:~$ 14
```

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(c)

```
jehan@jehan-VirtualBox:~$ alias m="mkdr new"
jehan@jehan-VirtualBox:~$ ls
Desktop  Downloads  Music  Pictures  Templates
Documents  Examples  desktop  new  public  Videos
jehan@jehan-VirtualBox:~$
```

## PRACTICAL - 7

### TOPIC : Linux Editors : vi

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

(i) Creating a file:

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

(ii) Modifying the file:

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

(iii) Search in a file:

To find a word [forward search] 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

## 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)	Move to first character of a line
s	Move to the 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

(i)

```
jelbo@jelbo-VirtualBox:~$ nano example  
Hello  
This is our Linux example  
Welcome  
Hello done  
This is VI Editor  
Thank you
```

```
jelbo@jelbo-VirtualBox:~$ vi example  
Hello  
This is my Linux example  
Welcome  
Hello done  
This is VI Editor  
Thank you
```

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

i) Replace

Syntax : `:/g/word to be replaced /s //new word /ge`

- (ii) Highlight  
Use `set hlsearch`.

```
jelbo@jelbo-VirtualBox:~$ :set hlsearch  
Hello  
This is our Linux example  
Welcome  
Hello done  
This is VI Editor  
Thank you
```

- (iii) Show the line number  
Use `set nu`.

```
06/02  
jelbo@jelbo-VirtualBox:~$ :set nu  
Hello  
This is our Linux example  
Welcome  
Hello done  
This is VI Editor  
Thank you
```

## Lecture - 8

### TCP : finitx security

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

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

To give some user root privilege edit /etc/  
suders using viudo . Enter new line as  
highlighted below

directly modifying local content in /etc/suders.d/ instead of  
is see the man page for details on how to write a suders file.

```
jeb@jeb-VirtualBox:~$ sudo visudo
Defaults    !sync
root      ALL=(ALL) NOPASSWD: /usr/bin/fclocal/bin/pin/pin, /bin/
                /sbin/
# most aliases specification
# user alias specification
# Cuid alias specification
# User privilege specification
root      ALL=(ALL) NOPASSWD: /usr/bin/fclocal/bin/pin/pin, /bin/
                /sbin/
```

### b) Directory operations that require sudo privileges

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

(( Modify expiration date for user1 using  
password aging ))

```
jeb@jeb-VirtualBox:~$ sudo chage -l user1
          Jan 20, 2019
          Never
          Password expires
          Account expires
          Min. number of days between password change
          Max. number of days between password change
          Number of days of warning before password expires
```

```
jeb@jeb-VirtualBox:~$ sudo chage -l user1
Changing the aging information for user1
Enter the new value, or press ENTER for the default
          Max. password age [99999]: 260
          Min. password age [0]: 100
          Last password change (YYYY-MM-DD) [2020-01-21]: 2020-01-21
          Password expiration [7]: 5
          Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
          Last password change -1: user1
          Password never changes
```

```
jeb@jeb-VirtualBox:~$ sudo chage -1 user1
          Password last change
          Password inactive
          Password expires
          Account expires
          Minimum number of days between password change
          Maximum number of days between password change
          Number of days of warning before password expires
```

```
jeb@jeb-VirtualBox:~$ sudo chage -E 25/01/2020 -n 10 -M 90 -I 30 -W 30 user1
          Last password change
          Password expires
          Password inactive
          Account expires
          Minimum number of days between password change
          Maximum number of days between password change
          Number of days of warning before password expires
```

- 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.

c) Delete newly added user.

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

10/10/09

## PRACTICAL - 9

**TOPIC : Network Management**

a) Get IP address of your machine using ifconfig.

```
jeba@jeba-VirtualBox:~$ ifconfig
jeba@jeba-VirtualBox:~$ ifconfig
eth0      Link encap:Ethernet HWaddr 00:0B:6B:69:6E:03
          inet addr: 172.217.31.196  Bcast:172.217.31.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:5240 errors:0 dropped:0 overruns:0 frame:0
          TX packets:5240 errors:0 dropped:0 overruns:0 frame: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
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)
```

b) Get hostname of your machine

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

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

Use ping to check the network connectivity to remote machines

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=82.6 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=84.8 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=87.1 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=64.5 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=66.9 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=98.0 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=66.9 ms
64 bytes from mab0328-in-f4.1e100.net (172.217.31.196): icmp_seq=9 ttl=54 time=96.9 ms
^Z+ Stopped
[1+ Stopped
jeba@jeba-VirtualBox:~$ ping www.google.com
```

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d) Use of dig command

```
jeba@jeba-VirtualBox:~$ dig www.google.com
jeba@jeba-VirtualBox:~$ dig www.google.com
;-->> DTC 9.10.3-P4-Ubuntu <<- www.google.com
; Global options: +cmd
; Got answer:
;-->> HEADER<-
; 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 172.217.166.198
; Query time: 152 msec
; SERVER: 172.1.1#53(127.0.0.1)
; WHEN: Mon Jan 26 22:48:06 IST 2020
; MSG SIZE rcvd: 59
jeba@jeba-VirtualBox:~$
```

## h) Use of netstat command and Nmap Command.

c) Troubleshooting network using traceroute, route command

```
jehadjeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.21.1.100), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.196 ms  0.151 ms
 2  *          *          *
 3  10.0.2.2 (10.0.2.2)  68.508 ms  68.486 ms  68.405 ms
```

```
jehadjeba-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway      Genmask      Flags Metric Ref Use Iface
default         10.0.2.2    0.0.0.0      UG        0      0      0 enp0s3
10.0.2.0        *            255.255.255.0 U           0      0      0 enp0s3
link-local      *            255.255.0.0   U           0      0      0 enp0s3
jehadjeba-VirtualBox:~$
```

d) Use of arp command

```
jehadjeba-VirtualBox:~$ arp -a
0: eth0 jehadjeba-VirtualBox-1d:8c:22:1b:1b:9f brd 10.0.2.255 state permanent flags ether 52:54:00:1b:1b:9f mask ff:ff:ff:ff:ff:ff
jehadjeba-VirtualBox:~$
```

e) Use of nmap command

```
jehadjeba-VirtualBox:~$ nmap www.google.com
Starting Nmap 7.61 ( https://nmap.org ) at 2020-01-20 22:51 IST
Nmap scan report for www.google.com (216.58.196.65)
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404.6800.4087.811::2004
Nmap scan report for 216.58.196.65 (bom05511-in-f4.1e10.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
```

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netstat -an   grep -i listening		listening connections (no servers)		Foreign Address	State
Protocol	Port	Type	State		
tcp        0.0.0.0	42249	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	9854	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	9855	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	9784	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	9856	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	44842	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	43231	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	42258	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	42242	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	43113	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	42912	LISTEN	LISTEN	10.0.2.1	LISTEN
tcp        0.0.0.0	42925	LISTEN	LISTEN	10.0.2.1	LISTEN

## PRACTICAL - 10

LESSON 10

**Aim:** Shell scripting  
Basic of shell Scripting

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

ECHO \$SHELL

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

chmod 777 filename.sh  
./filename.sh

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

```
tcsc@tcsc-VirtualBox:~$ echo "THIS IS LINUX!"
```

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

Step to write and execute a shell script  
shell script is just a simple text file with .sh extension  
having executable permission.

- Open terminal
- Navigate to the place where you want to create script using `cd` command
- Touch `filename.sh`
- vi filename.sh [You can use your favourite editor, to edit the script]
- `chmod 777 filename.sh` (For making the script executable)
- `sh filename.sh` or `./filename.sh` (for running the script)

Q1 Program to display your name.

```
#!/bin/bash
echo "Hello, Your Name."
read name
echo "My name is : $name."
```

```
test@tesc-VirtualBox:~
```

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

Program to bind the sum of two variables.

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

Q1

Program to bind the sum of two no's entered during execution

```
test@tesc-VirtualBox:~$ ./num2.sh
test@tesc-VirtualBox:~$ chmod 777 num2.sh
test@tesc-VirtualBox:~$ ./num2.sh ...
TANVI
test@tesc-VirtualBox:~$
```

"TANVI" 3 lines, 40 characters

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```
tesc@tesc-VirtualBox:~$ vi lln.sh
tesc@tesc-VirtualBox:~$ chmod 777 lln.sh
tesc@tesc-VirtualBox:~$ ./lln.sh
sum 1s:120
tesc@tesc-VirtualBox:~$
```

Sed.

Sed command or Stream Editor is very powerful utility offered by Linux system. It is mainly used for text substitution, bind & replace etc. It can perform other text manipulations like insertion, deletion, search etc. with sed, you can edit/convert files without actually having to open it.

Consider the following text file.

```
tesc@tesc-VirtualBox:~$ cat es.txt
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
tesc@tesc-VirtualBox:~$
```

- 1) Displaying partial text of a file with Sed, we can view only part of a file rather than seeing whole file. 62

```
tesc@tesc-VirtualBox:~$ vi es.txt
tesc@tesc-VirtualBox:~$ sed -n 3,5p es.txt
subjects offered in cs
datastructure
database management
linux
python
```

- 2) Displaying all content of a file except for some portion we use option 'd'.

```
tesc@tesc-VirtualBox:~$ sed 3,5d es.txt
green tech
softskill
stats
calculus
computer basic
tesc@tesc-VirtualBox:~$
```

- 3) Replacing a line, use line number followed by 'd'.

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

4) Search and replacing a string  
5) Option **i** for searching a word.

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

5) Replace a string on a particular line.  
To replace a string on a particular line, we line  
number with **'s' option.**

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

6) Add a line after, before the matched string.  
To add a new line with some content after every  
pattern match, use option **a**.

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

To add new line some content before every  
pattern match, use option **i**.

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

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**.

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

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8) Appending lines. We can do this by adding some content before every line with 'sed'. Use & and & as follows.

```
tee@tee-VirtualBox:~$ sed -e '$!,*Thanks $' cs.txt  
Thanks subjects offered in cs.  
Thanks database management  
Thanks linux  
Thanks python  
Thanks green tech  
Thanks softskill  
Thanks stats  
Thanks calculus  
Thanks computer basic
```

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