

## PRACTICAL-1

**AM:** 1. Install your choice of Linux distribution

e.g: Ubuntu, fedora

2. Customize desktop environment by changing different default options like: Changing default background, themes, screensaver.
3. Screen Resolution
4. Time settings.

**[1]** Steps for installation of Linux distribution - (Ubuntu)

Step 1:

Install virtual box

Step 2

① Open virtual box . Double click the virtual box app icon.

Step 3.

Click now . It's a blue border in the upper left corner of the virtual box & windows icon appears a pop up menu

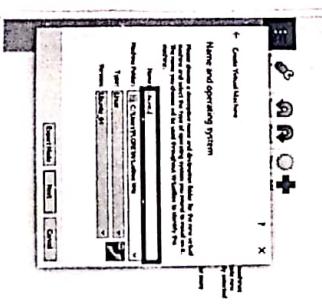
Step 4

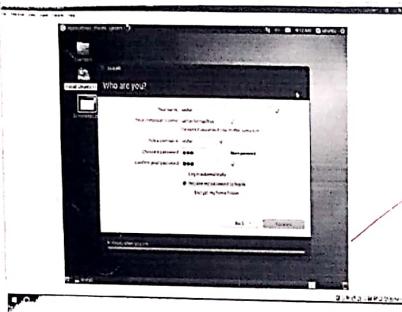
Select a name for your virtual machine . Type whatever you want to name your virtual machine

(e.g.: Ubuntu ) the name text field that means top of the pop up menu

Step 5.

Select "Linux" as the "Type" value : Click the "Type" drop down box , then click Linux in the resulting dropdown





Step 6: Select Ubuntu as the "Version" value: Ubuntu should be selected by default after you set the "Type" value to Linux, but it is not. Click the "version" drop down box and click Ubuntu (64bit) before proceeding.

Step 7: Click Next. It's the bottom of the menu.

Step 8: Select an amount of RAM to use: click and drag the slider left or right to decrease or increase the amount of RAM. The ideal amount of RAM will automatically be selected when you get to this page. Make sure not to increase the RAM into the red section of slides.

Step 9: Create your virtual machines, virtual hard drive. The virtual hard drive is a section of your computer hard drive space which will be used to store yours.

Step 10: Click Next! At the bottom of the menu.

2] Customize desktop background by changing different display options like changing desktop background, themes, screensavers:

#### Accessing Appearance settings

To access Appearance settings in Ubuntu, lets click on User menu at the top right corner, on the top menu bar and select system settings. A window will pop-up with all settings divided into personal, hardware and system options icons. Lets first select the Appearance icon.

#### Changing wallpaper picture

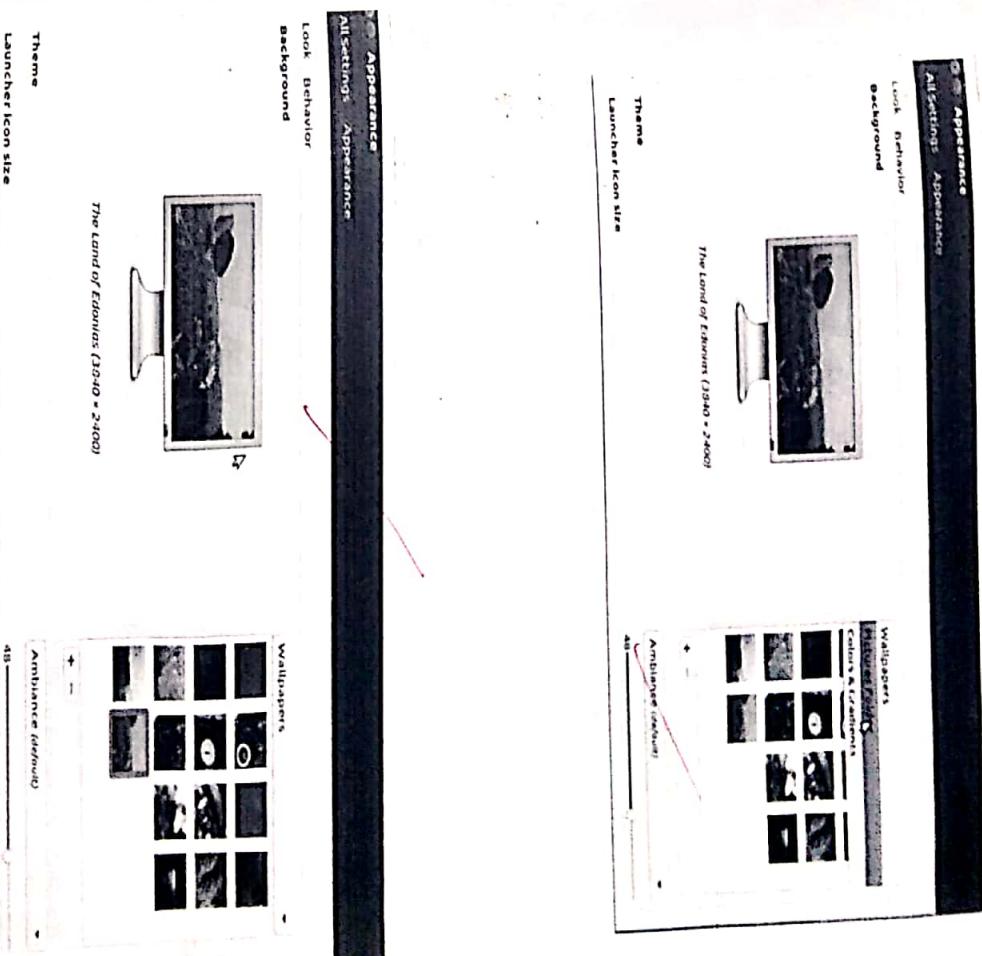
On the left side of Background part, you can see your current wallpaper.

Our the right side is part where we can select one of Ubuntu wallpapers. Clicking on any thumbnail our wallpaper will be changed right away, with a fading effect.

If you want to select wallpaper from your picture folder, click the drop down menu above thumbnails and select the Picture folder.

You will see all the pictures in your Pictures folder as thumbnails where you can select them as your wallpaper.

To add wallpaper that is in another folder just click the plus icon below the thumbnails and then in pop up window, select the path to our custom folder and choose the picture inside of it.



### Changing Ubuntu theme

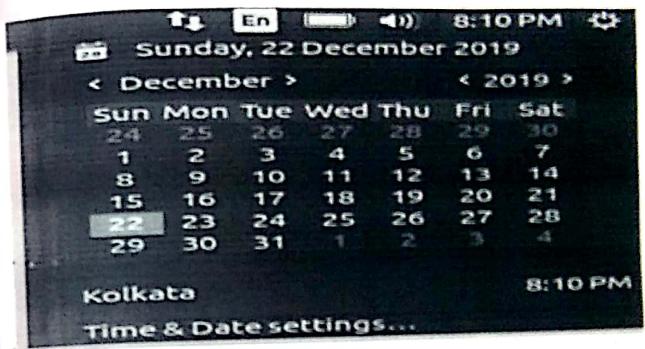
- Ubuntu also has an option to change the Desktop theme, which in one click will change the entire way your computer looks.
- To do that, click on the drop down menu below the wallpaper thumbnails, and choose between Ambiance, Radiance or High contrast.
- Ambiance is a light theme that looks a bit more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

3] Screen Resolution : Ascertain the current screen resolution for your desktop.

- Change the size or rotation of the screen
- You can change the how big (or default detailed) things appear on the screen by changing the screen resolution.
  - You can change which way up things appear (eg: if you have a rotating display) by changing the rotation.
- Click the icon on the very right of the menu bar and select ~~System setting~~.
  - Open screen display.
  - If you have multiple display and they are not mirrored, you can have different settings on each display. Select a display in the preview area.
  - Select your desired resolution and rotation.
  - Click Apply. The new settings will be for 30 sec before reverting back. That way, if you cannot see anything with the new.

#### 4] Time settings

- If you are currently in India time. How does the displayed time change?
- After noting the time change, change the time zone back to your local time zone.
- Just click on the clock on the top bar, and choose Time and Date settings. Once the Time and Date window opens, choose Manually, so you can change the time and date manually; otherwise choose your time zone from the map and check Automatic.



## PRACTICAL-2

Aim: Installing and removing software:

a) Install gcc package, Verify that it runs and then removes it.

Step 1:

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

Step 2:

Type ~~sudo apt~~ '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 top-level uninstall target, some directories do have it, in particular gcc, so you can do it.

Type: `cd build/gcc  
sudo make uninstall`

18.

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

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## PRACTICAL - 3

AIM: Utilization of grep, man commands  
Documentation:

- a) Finding info documentations 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 commands is 'info (command name)'.

- We are going to find the info about the 'grep' command.
- Open the terminal ( $Ctrl + Alt + T$ ) and type: info grep
- After typing this command following output will be displayed onto your screen.
- You can also scroll through pages using (space = up) & (backspace = down) keys.
- 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 end line. Bring up the man page for the 'ls' command. Scroll down to the Example section.

Ans

To use the 'man' command, simply type 'man (command name)', i.e. man ls.

- ~a, --all - do not ignore entries starting with .
- -A, --almost-all - do not list implied .ad
- d, --directory list entries instead of contents, and do not dereference symbolic link.
- f, --classify - append indicator (one of \*/=>(D)) to entries .

C] finding man pages by topic; what man pages are available that document file compression.

Ans

'Tar' 'Zap' are some man pages which are available for document file compression simply by 'man Tar' and 'man Zap'.

- Man zip:
  - add - update existing entries and add new files. If the archive does not exist create it. This is the default mode.
  - freshen (-f): update existing entries of an archive if newer on the file system does not add new files to the archive
  - delete (-d): select entries in an existing archive and delete them

→ **copy (-u)**: Select entries in an existing archive and copy them in new archive.

• **Man Tar:**

-no-add

-no-acl - disable the Posix ACLs support

-add file : add given file to the archive  
(useful if file names start with dash)

-anchored - patterns match file name starts

-b, --blocking - factor blocks:

blocks  $\times$  512 bytes per record.

• finding man pages by section from the (condlines)  
bring up the man page for the printfile function.  
which manual page section are library function  
found.

~~thus: The number corresponds to what section of  
the manual page of the printfile.~~

→ ~~1 1 (a space)~~ A blank should be left before  
a positive number (or empty string) produced  
by a signed conversion.

→ + A sign (+ for -) should always be placed  
before a number produced by a signed conversion  
→ + - The converted value is to be left adjust  
out the field boundary.

→ h - A following integer conversion corresponding to a signed char or unsigned to char argument, or a following n conversion corresponds to a pointer to a signed char.

• Command line Help list the available options for the mkdir command. How can you do this?

\$ mkdir -m a=rwx directory name.

5/2  
23/2

## PRACTICAL - 4

Command line operation:

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 passed file in / using find command

✓ # find / -name passwd

- /usr/share/doc/nss-ldap-2.13/pam.d/passwd
- /usr/bin/passwd
- /etc/pam.d/passwd
- /etc/passwd

find the directory passwd file under root and one level down

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

find the passwd file under root and 2 level down

✓ # find / -maxdepth 3 -name passwd

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/man1/ls.1.gz
```

# whereis ps

```
ps : /bin/ps /usr/share/man/man1/ps.1.gz
```

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

• /etc/pam.d/ password

d) Create a symbolic link to the file you found in last step.

# whereis bash

bash : /bin/bash /etc/bash.bashrc /usr/share/man/man1/bash.1.gz

bash.1.gz

1)

Create an empty file example.txt and move it to /tmp directory using relative path name

```
# touch example.txt  
# mv example.txt /tmp
```

✓ 10/10

• /var/bin/password  
• /etc/pam.d/password  
• /etc/pam.d/password

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

# find -maxdepth 3 -maxdepth -5name=passwd

• /var/bin/passwd

• /etc/pam.d/passwd

• /etc/pam.d/password

2)

Create an empty file example.txt and move it to /tmp directory using relative path name

```
# touch example.txt  
# mv example.txt /tmp
```

✓ 10/10

## PRACTICAL - 5

file Operations

Explore mounted file systems on your computer  
df -k

Filesystem	K-blocks	Used	Available	Use%	Mounted on
udev	494436	0	494436	0%	/dev
tmpfs	102416	3676	98740	4%	/run
/dev/sda1	7092728	3383372	3376024	51%	/
tmpfs	512076	216	511860	1%	/run/shm
tmpfs	5120	4	5116	1%	/run/lock
tmpfs	512076	0	512076	0%	/sys/fs/cgroup
tmpfs	5120416	48	102368	1%	/run/user/1000

jebajeba-VirtualBox:

```
jebajeba-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 devfs (rw,nosuid,noexec,relatime,fsync=1,mode=0733)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,ptmxmode=0755)
tmpfs on /tmp type tmpfs (rw,nosuid,nodev,noexec,relatime)
/dev/sda1 on / type ext4 (rw,nosuid,nodev,noexec,relatime,barrier=1,data=ordered)
tmpfs on /run type tmpfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /sys/fs/cgroup type tmpfs (ro,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/systemd/cgroup-subtree-type-pstore type cgroup (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuset)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net_cls,net_prio)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,mem)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,inotify)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,inotify)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,inotify)
cgroup on /sys/fs/cgroup/bikts type cgroup (rw,nosuid,nodev,noexec,relatime,bikts,inotify)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,inotify)
cgroup on /sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgn=1,timeout=0,minproto=5,maxproto=5,dirname=/dev/hugepages) type hugetlbfs (rw,relatime)
```

Ans

What are the difference ways of exploring mounted file systems on Linux.

Ans

- Copy text from file.
- Copying command, mv command.



```
jebajeba-VirtualBox:~$ touch ss.txt
jebajeba-VirtualBox:~$ mv 99.txt ss.txt
jebajeba-VirtualBox:~$ cat ss.txt
cat: ss.txt: No such file or directory
jebajeba-VirtualBox:~$ cat dd.txt
cat: dd.txt: No such file or directory
jebajeba-VirtualBox:~$ cat ss.txt
ss.txt
jebajeba-VirtualBox:~$
```

QUESTION

6. Archiving and backing the work directory using tar, gzip and bzip commands?

```
ans
gzip filename.txt
Bzip filename.txt
```

5)

- Use diff command to create diff of two files.

```
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt ss.txt.gz
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
BZh9IAV&SY
jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.gz ss.txt.gz
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
jeba@jeba-VirtualBox:~/jeb$ dd.txt+0*W*****+Xzjeba@jeba-VirtualBox:~/jeb$
```

Ans

- 6) Use patch command to patch a file. And archive the patch using patch command again.

```
jeba@jeba-VirtualBox:~/jeb$ ls
aa.txt bb.txt
jeba@jeba-VirtualBox:~/jeb$ cat >aa.txt
hello world
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
hello world
jeba@jeba-VirtualBox:~/jeb$ cat >bb.txt
this is Linux
jeba@jeba-VirtualBox:~/jeb$ gzip aa.txt
Binary files aa.txt.gz and bb.txt.gz differ
jeba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
aci
hello world
jeba@jeba-VirtualBox:~/jeb$ this is Linux
jeba@jeba-VirtualBox:~/jeb$ cat >ht.txt
hello
hello
jeba@jeba-VirtualBox:~/jeb$ patch >sam.patch
jeba@jeba-VirtualBox:~/jeb$ patch .sam.patch
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch
jeba@jeba-VirtualBox:~/jeb$ cat sam.patch
patch 2020-01-08 22:14:55 +0530
++ ht.txt
@@ -1,3 +1,3 @@
-ht
+
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$
```

*25%*

## Practical - 6.

### Use Environment

- a) Which account you are logged in? How do find out?  
who command & whoami

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

```
jeba@jeba-VirtualBox:~$ who
eba@jeba-VirtualBox:~$ who
eba@jeba-VirtualBox:~$ whoami
eba@jeba-VirtualBox:~$ who -l
eba@jeba-VirtualBox:~$ 2020-01-15 20:30
eba@jeba-VirtualBox:~$ 780 id=tv1
eba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
jeba:$6$99999:7:::
root:$6$99999:7:::
daemon:$6$99999:7:::
bin:$6$99999:7:::
sys:$6$99999:7:::
sync:$6$99999:7:::
games:$6$99999:7:::
an:$6$99999:7:::
p:$6$99999:7:::
all:$6$99999:7:::
less:$6$99999:7:::
```

- b) Display /etc/shadow file using cat command and understand the importance of shadow file. How its different than passwd file.  
→ cat /etc/shadow  
At initial password file, each file in the shadowfile is also separated with ":" colon character, and are as follows.

- Username upto 8 characters . Last sending , usually all lowercase . A direct match to the username in the etc /passwd file.
- Password , 13 characters encrypted . A blank entry (eg: \*) (eg & :) indicates a password is not required to log in (usually a bad idea) and a "\*" entry (eg: \*) indicates the account has been disabled.
- The number of days since January 1, 1900 since passed was last changed.
- The number of days before password may be changed (0 indicates it may be changed at anytime)
- The number of days to warn user of an expiring password (n for a full week)

- The no of days after password expires the account is disabled.
  - A reserved field for possible future use.
  - Each field in a password entry is separated with colon character & are as follows:
    - Username , up to 8 characters , case-sensitive , usually all lowercase
    - An "x" in the password field. Passwords are stored in the "etc/shadow" file
    - Numeric user id. This is assigned by the "adduser" script. Unix uses this field , plus the following group field to identify which files belong to the user.
    - Full name to user. I'm not sure what the maximum length for this field is , but try to keep it reasonable (under 30 characters)
    - User shell's account . Often set to "/bin/bash" to provide access to the bash shell. (my personal favorite shell)
- c) Get your current working directory  
→ Pwd

```
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:4:4:sync:/bin:/bin/sync
games:x:5:50:games:/usr/sbin:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpt:/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
lftp:x:38:38:Maildir List Manager:/var/list:/usr/sbin/nologin
jeba@jeba-VirtualBox:~$ history
jeba@jeba-VirtualBox:~$ pwd
/home/jeba
jeba@jeba-VirtualBox:~$
```

```
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:4:4:sync:/bin:/bin/sync
games:x:5:50:games:/usr/sbin:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpt:/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
lftp:x:38:38:Maildir List Manager:/var/list:/usr/sbin/nologin
jeba@jeba-VirtualBox:~$ history
jeba@jeba-VirtualBox:~$ pwd
/home/jeba
jeba@jeba-VirtualBox:~$
```

- d) Explain different ways of getting command history , how to run previously executed command without typing it.
- history ! line number

```
cba@eba-VirtualBox:~$ alias m="mkdir new"
cba@eba-VirtualBox:~$ m
cba@eba-VirtualBox:~$ ls
desktop  Downloads  Music  Pictures  Templates
documents examples.desktop  jj  new  public  Videos
cba@eba-VirtualBox:~$
```

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

## PRACTICAL-7

### LINUX EDITORS : Vi

- a) Create, modify, search and navigates 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 'a'
- 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 |

jabat@jabat-VirtualBox:

Hello  
This is my Linux example  
Welcome  
Welldone  
This is vi editor  
Thank you

jabat@jabat-VirtualBox:

Hello  
This is my Linux example  
Welcome  
Welldone  
This is vi editor  
Thank you

more highlights

key

b

e

o (nu)

\$

You's back to our logging after word  
Users forward to the end of word.  
Home forward to the beginning of word  
Delete is the first character of line  
Press to the end of line

scrolling

key

d

u

g

g

ctrl + u

option

ctrl + forward

ctrl + backward

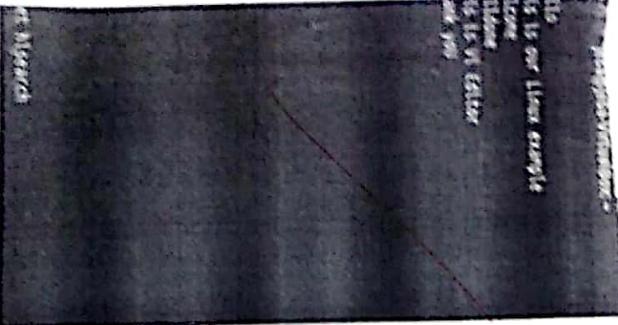
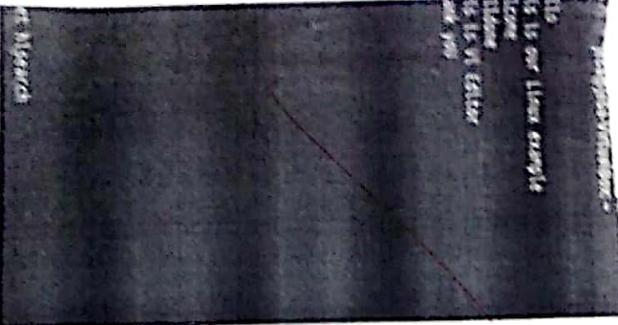
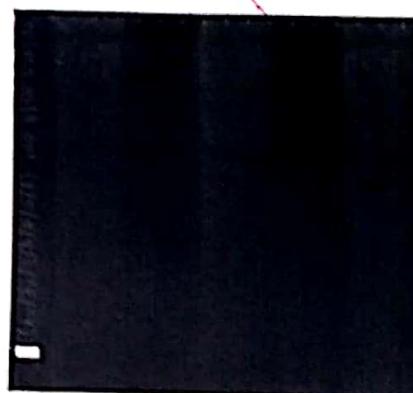
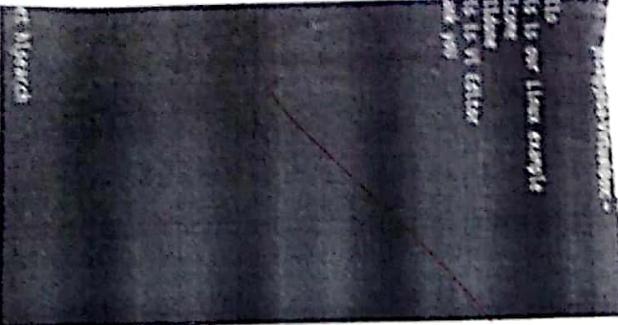
ctrl + half page

ctrl + last page

ctrl + middle mouse

i) Using all numerical commands like search, replace,  
highlight, show line numbers.

ii) Replace  
Syntax : /g! work to be replaced // next work/gc



21

ii) highlight  
Use alt search

vi)

Shows the line number  
Use alt nu

52

*guru*

```
jeba@jeba-VirtualBox:~  
Hello  
This is our Linux example  
Welcome  
Welldone  
This is Vi Editor  
Thank you
```

```
jeba@jeba-VirtualBox:~  
Hello  
This is our Linux example  
Welcome  
Welldone  
This is Vi Editor  
Thank you
```

### PRACTICAL - 8

a) i)

#### linux security

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

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

b)

- b) Identify operations that require sudo privileges

```
# 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/"
#
# Host alias specification
#
# User alias specification
#
# Cmnd alias specification
#
# User privilege specification
root    ALL=(ALL:ALL) ALL
user1   ALL=(ALL:ALL) ALL
```

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

```
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 password aging

d)

Expiration Date - E  
M - Minimum no. of days before password change

M - No. of days password is valid.

I - Account inactive

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

d)  
Delete newly added user.

```
jeba@jeba-VirtualBox:~$ sudo chage -E 01/01/2029 -m 10 -M 90 -I 30 -W 30 user1
jeba@jeba-VirtualBox:~$ sudo chage -l user1
      Minimum Password Age [0]: 100
      Maximum Password Age [99999]: 200
      Last Password Change (YYYY-MM-DD) [-]: 2020-01-20]
      Password Expiration Warning [7]: 5
      Password Inactive [-1]:
      Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31

      Minimum number of days between password change : Jan 21, 2020
      Maximum number of days between password change : Aug 08, 2020
      Number of days of warning before password expires : never
      Account expires : Jan 31, 2020
      Minimum number of days between password change : 100
      Maximum number of days between password change : 100
      Number of days of warning before password expires : 100
      Account inactive : Jan 01, 2022
      Minimum number of days between password change : 90
      Maximum number of days between password change : 90
      Number of days of warning before password expires : 30
```

```
jeba@jeba-VirtualBox:~$ sudo chage -E 01/01/2029 -m 10 -M 90 -I 30 -W 30 user1
jeba@jeba-VirtualBox:~$ sudo userdel user1
[judo] password for jeba:
jeba@jeba-VirtualBox:~$ su user1
No passwd entry for user 'user1'
jeba@jeba-VirtualBox:~$
```

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

## PRATICON - 9

### Network Management

a) Get IP address of your machine using ifconfig

```
jeba@jeba-VirtualBox:~$ ifconfig
eth0      Link encap:Ethernet HWaddr 08:00:27:0E:0B:09
          inet addr: 172.17.0.2 brd 172.17.0.255 Mask:255.255.255.0
          inet6 addr: fe80::0c0:27ff:fe0e:0b09/64 Scope:Link
            txqueuelen:1000  Metric:1
            RX packets:73 errors:0 dropped:0 overruns:0 frame:0
            TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:1180 (1.1 kB)  TX bytes:8518 (8.5 kB)

Link encap:local loopback
inet addr: 127.0.0.1 brd 127.0.0.0 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
            txqueuelen:1000  Metric:1
            RX packets:53246 errors:0 dropped:0 overruns:0 frame:0
            TX packets:53246 errors:0 dropped:0 overruns:0 carrier:0
            collisions:0 txqueuelen:1
            RX bytes:4225072 (4.2 MB)  TX bytes:4225072 (4.2 MB)
```

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

b) Get IP address of your machine

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

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=7.8 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=2.0 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=4.8 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=7.1 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=3.5 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=6.9 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=8.0 ms
4 bytes from maa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=9.9 ms
Z
1+ Stopped
eb@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ ping www.google.com
```

```
jeba@jeba-VirtualBox:~$ dig www.google.com
```

```
<>> ;dig 9.10.3.84-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
EDNS: version: 0, flags: ud: 4096
QUESTION SECTION:
www.google.com.
```

```
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)
```

c) Troubleshooting network using tracertroute command

```
jebab@jeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.21.1.100), 30 hops max, 40 byte packets
 1  0.0.2.0 (10.0.2.1)  0.199 ms  0.143 ms  0.131 ms
 2  10.0.2.2 (10.0.2.2)  65.348 ms  68.466 ms  65.433 ms
```

```
jebab@jeba-VirtualBox:~$ route
Kernel IP routing table
Destination      Gateway          Genmask         Flags Metric Ref    Use Iface
default         0.0.0.0        0.0.0.0        UG    0      0        0 enp0s3
eth0            0.0.0.0        255.255.255.0   U     100    0        0 enp0s3
eth0            255.255.0.0    0.0.0.0        UH    100    0        0 enp0s3
```

d) Use of arp command

```
jebab@jeba-VirtualBox:~$ arp
inetbrd@jeba-VirtualBox:~$ arp
inetbrd@jeba-VirtualBox:~$ arp
inetbrd@jeba-VirtualBox:~$ arp
```

```
jebab@jeba-VirtualBox:~$ host -V
jebab@jeba-VirtualBox:~$
```

```
jebab@jeba-VirtualBox:~$ netstat -an | grep www.google.com
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:www             10.0.2.2:5443      ESTABLISHED
tcp        0      0 0.0.0.0:www             10.0.2.2:5443      ESTABLISHED
tcp        0      0 0.0.0.0:www             10.0.2.2:5443      ESTABLISHED
```

e) Use of netstat command and Nmap command.

```
jebab@jeba-VirtualBox:~$ netstat -an | grep www.google.com
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:www             10.0.2.2:5443      ESTABLISHED
tcp        0      0 0.0.0.0:www             10.0.2.2:5443      ESTABLISHED
tcp        0      0 0.0.0.0:www             10.0.2.2:5443      ESTABLISHED
```

```
jebab@jeba-VirtualBox:~$ nmap www.google.com
```

```
jebab@jeba-VirtualBox:~$ nmap www.google.com
Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-20 22:51 +53
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404:6500:4001:811::2004
PORT      STATE SERVICE
80/tcp    open  http
443/tcp   open  https
nmap done: 1 IP address (1 host up) scanned in 20.32 seconds
```

## Practical - 10.

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

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

## Aim: Shell Scripting

- Basics 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
```

```
vi filename.sh
```

```
#!/bin/bash
```

```
echo "This is Linux"
```

```
chmod 777 filename.sh
```

```
./filename.sh
```

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

- Open terminal
- Navigate to the place where you want to create script using cd command.

- c. Touch filename.sh [You can use favorite editor to edit it]  
 d. Us filename.sh [You can use favorite editor to edit it]  
 to edit the script]
- e. chmod +x filename.sh [For making the script executable]
- f. sh filename.sh or ./filename.sh [for running the script]

Program to display your name.

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

Program to find sum of two

```
vi filename.sh
#!/bin/bash
a=100
b=150
sum=$((a+b))
echo $sum
echo "Sum is:$sum"
```

```
tsc@tsc-VirtualBox: ~
$ vi lin.sh
tsc@tsc-VirtualBox: ~$ vi lin.sh
tsc@tsc-VirtualBox: ~$ chmod 777 lin.sh
tsc@tsc-VirtualBox: ~$ ./lin.sh 50 70
Sum is:125
tsc@tsc-VirtualBox: ~
tsc@tsc-VirtualBox: ~
$ ./lin.sh 51 52
Sum is:103
tsc@tsc-VirtualBox: ~
tsc@tsc-VirtualBox: ~
$ ./lin.sh 51 53
Sum is:104
tsc@tsc-VirtualBox: ~
```

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

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

"lin.sh" 3 lines, 40 characters

programs to find sum of 2 no's (values passed during execution) :

```
sed
```

```
sed command or stream editor is very powerful utility offered by Linux systems. It is mainly used for text substitution. Just & 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.

- 1) Displaying partial text of a file.  
With sed, we can view only part of a file rather than being whole file.
- 2) Display all except some lines  
To display all content of a file except for some portion, use option 'd'
- 3) Deleting a line  
To delete a line, use line no. followed by d
- 4) Search and replacing a string  
's' is option for searching a word

```
tcscscc-VirtualBox: ~$ sed 3,5d cs.txt
subjects offered in cs
green tech
softskill
stats
calculus
computer basic
tcscscc-VirtualBox: ~$
```

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

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5. Replace a string or particular line  
To replace a string on a particular line use line no.  
To replace a string on a particular line use line no.  
with 's' option
6. Add a line after / before the matched string.  
To add new line with some content after  
every pattern match, use option 'a'
7. To change a whole line with matched pattern.  
To change a whole line to a new line when a  
search pattern matches, use option 'c'.
8. Appending lines  
To add some content before every line with red,  
use \* and & as follows.

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

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

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

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