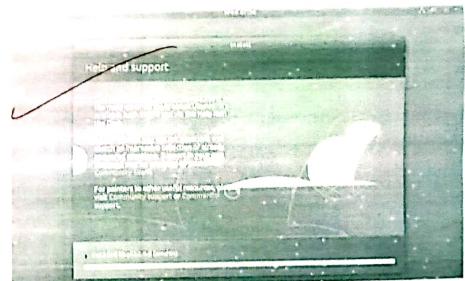
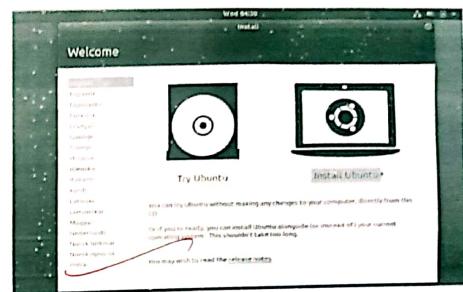


### Practical No. 1

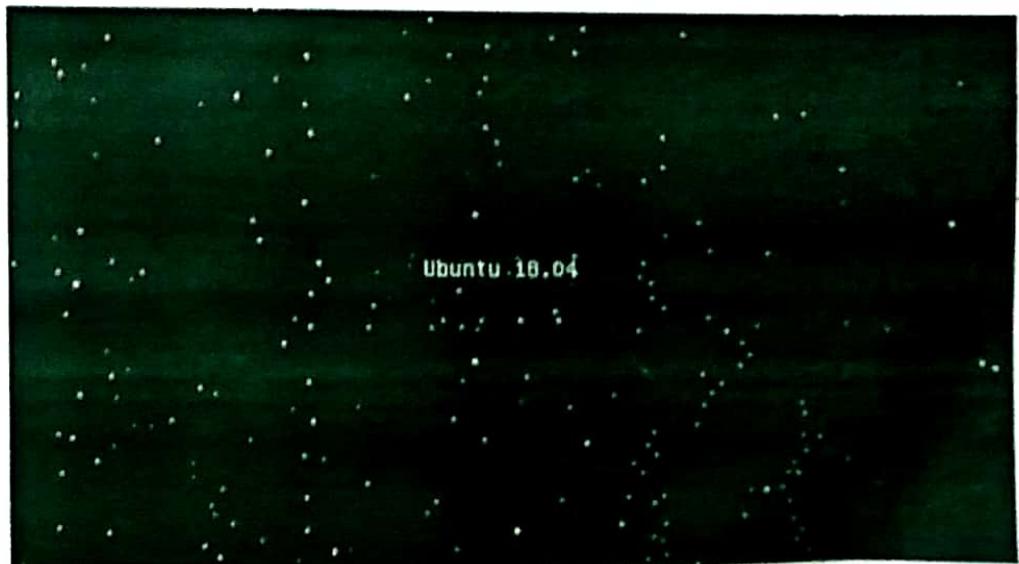
- Aim : 1) Install your choice of Linux distribution  
e.g Ubuntu, Fedora.  
2) Customize desktop environment by changing different default options like changing default background, theme, screensavers.  
3) Screen resolution.  
4) Time settings.

Steps to install Ubuntu.

- Step 1: Install Virtual Box.
- Step 2: Open Virtual Box, double click the Virtual Box app.
- Step 3: Click New. It's a table bar in the upper left corner of the Virtual Box column.
- Step 4: Enter the name of your virtual machine type word variable by its name and it should be in Single q.
- Step 5: Select Linux as the type click on type a dropdown will appear then click on the name.
- Step 6: Select Ubuntu as the version name Ubuntu should be selected by default after you set type value to Linux select on Ubuntu (64 bit) by proceeding.
- Step 7: Click next, it's at the bottom of the menu.



- 8: Select an amount of RAM now. Click and obey the slides left or right to decrease or increase the amount of RAM. The needed amount of RAM will be negative when you RAM
- 9: Then click ~~Next~~ next. It's at the bottom of the menu.
- 10: Create your virtual machine virtual ~~hard~~ ~~and~~ hardware which will be used to store your virtual machine program.  
click create.  
click next.  
~~where~~ select an amount of space to be used.  
click create.
- 11: Make sure that your Ubuntu is down and you can create working with it



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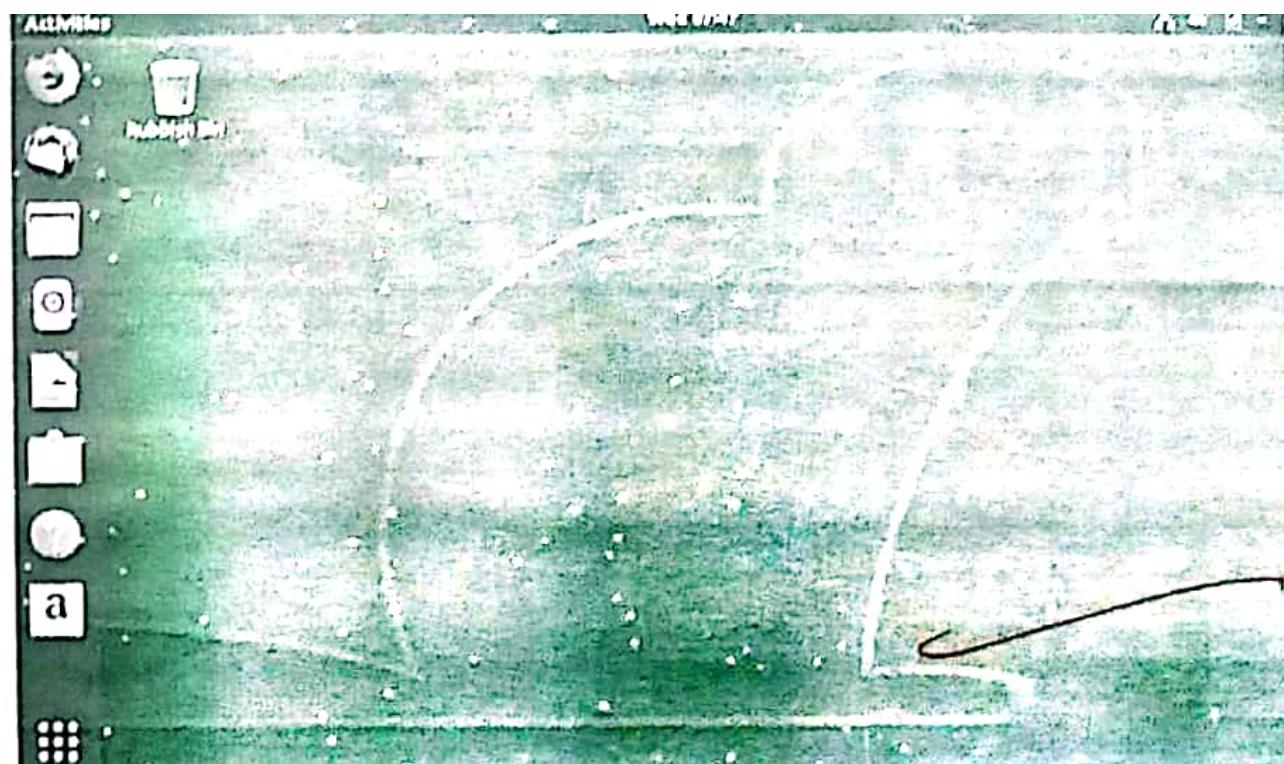
pop-up window, select the path to our custom folder and choose the picture inside of it.

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.

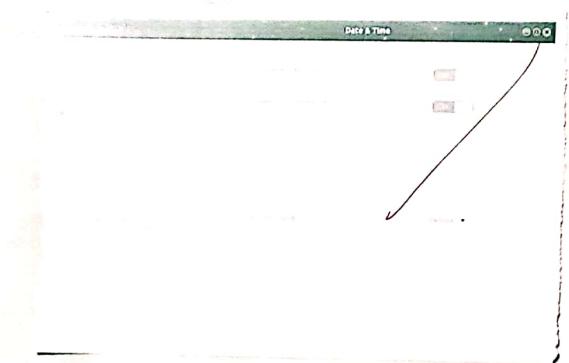
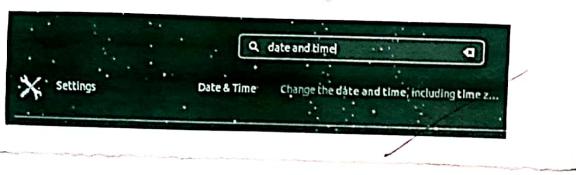
To do that, click on the drop-down menu below the wallpaper thumbnails and choose between Ambiance, Radiance or High Contrast.

Ambiance is a light theme that looks a bit more Mac-like while Radiance is darkest brown theme used in Ubuntu by default.

16/02



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- u) Time settings : change the time zone of your system  
(or New York Time)

If you are currently in Indian Time?  
How does the display time change?

After noting the time change, change the time zone  
back to your local time zone.

~~8  
10/10/2022~~

## Practical No. 2.

Aim: installing and removing software

- a) Install 'gcc' package, verify that it runs and then remove it.
- Step 1: First type 'gcc -v' to know if you have already installed gcc compiler or not. If the output is blank then it means that you don't have gcc installed.
- Step 2: Type 'sudo apt-get install gcc'. After typing the following command installation will take place.
- Step 3: Type 'sudo apt-get install build-essential' this will install all the libraries required for C & C++ programming language.

Now to install GCC compiler.

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

Type : `cd build/gcc  
sudo make uninstall.`

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

8/10/12

## 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.

→ To find info about any command 'info' command is used  
The syntax of info command is "info (common name)"

We are going to find the info about the 'grep' command

open the terminal ( $ctrl + alt + T$ ) and type: info grep

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

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

Another one summarized form of showing info is the main command, the command is same as 'info' but requires data.

<code>print</code>	(1) - format and print data
<code>printf</code>	(10) - write formatted output
<code>printf</code>	(3) - formatted output conversion
<code>printf</code>	(89) - print formatted output
<code>printenv</code>	(1) - bash builtin command, see hash(1)

- (b) Finding man pages from the end line bring up the man page is command scroll down to the example section.
    - To use the 'man' command simply type 'man (command name)'  
Now we are going to find the manual for 'ls' command.  
Simply type: 'man ls'
  - (c) Finding pages by topic: what man pages are available for document file compression.
    - 'tar', 'zip' are some man pages which are available for document file compression.  
Simply type: 'man zip'  
  
• man tar

(d) Finding man pages by the section from the end line bring up the man page from the print lib function. which manual page section are library function found.

→ The number corresponds to what section of the manual page is from; 1 is user command while 8 is sysadmin stuff. The man page for man itself explain it and list the std one.

There are certain terms that have different page in different sections (eg. 'printf' as a command appears in section 1 as a stdlib 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.

~~you can tell what section a term falls in with 'man.k' (equivalent to apropos command) It will do substituting matches so need to use " term to limit it.~~

~~for  
1 or 2~~

### Practical No. 4.

command line operations:-

Install new package on your system.

sudo apt-get install (package name)

Remove the package installed.

sudo apt-get remove (package name)

Find the passwd file in/using find command.

# find / -name passwd

./usr/share/doc/nss-ldap-253/pam.d/passwd

./usr/bin/passwd

./etc/pam.d/passwd

./etc/passwd

Find the directory passwd file under root & one level down

# find / -maxdepth 2 -name passwd

./etc/passwd

Find the passwd file under root & two level down

# find / -maxdepth 3 -name passwd

./usr/bin/passwd

./etc/pam.d/passwd

./etc/passwd

## File Operations:

### Practical 5

1. Explain mounted file systems on your computer.

→ 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 3326824 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
```

2. Where are the different ways of exploring mounted file systems on Linux?

→ 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,nodev,noexec,relatime,size=4944752k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,size=4944752k,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,release_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,cpu
acct,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/bikio type cgroup (rw,nosuid,nodev,noexec,relatime,bikio,nsroot=/
)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf.event
,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsro
ot=/)
systemd-1 on /proc/sys/fs/btnfnt_misc type autofs (rw,relatime,fd=32,pgrp=1,ttimeout=0,minp
rotos=5,maxprotos=5,direct)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```



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

```
jehad@jeha-VirtualBox:~/jeh5$ cat >hi.txt
hi
hi
hi
jehad@jeha-VirtualBox:~/jeh5$ cat >hi1.txt
hello
hello
hello
jehad@jeha-VirtualBox:~/jeh5$ diff -u hi.txt hi1.txt
jehad@jeha-VirtualBox:~/jeh5$ patch <san.patch
patching file hi.txt
jehad@jeha-VirtualBox:~/jeh5$ cat san.patch
--- hi.txt      2020-01-08 22:14:55.403569834 +0530
+++ hi1.txt     2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
hi
hi
hello
jehad@jeha-VirtualBox:~/jeh5$
```

*Jehad*

### Practical NO.6

- a) which account you are logged in? How do you find out?  
 → who command & whom

```
Anc who command & whom
[jehad@jeha-VirtualBox:~]
jehad@jeha-VirtualBox:~$ who
jehad@jeha-VirtualBox:~$ whomai
jehad@jeha-VirtualBox:~$ who -l
jehad@jeha-VirtualBox:~$ who -l -u
jehad@jeha-VirtualBox:~$
```

---

```
jehad@jeha-VirtualBox:~$ who -w
20:32:4 min, 1 user, load average: 0.79, 0.79, 0.38
user   TTY   FROM          LOGIN@  IDLE CPU  %CPU WHAT
jeha   ttys2  0             20:32  4:28  0.19%  0.33% /sbin/upstart
jehad@jeha-VirtualBox:~$ who -w
20:32:4 min, 1 user, load average: 0.66, 0.77, 0.37
user   TTY   FROM          LOGIN@  IDLE CPU  %CPU WHAT
jeha   ttys2  0             20:32  4:38  0.19%  0.33% /sbin/upstart --user
jehad@jeha-VirtualBox:~$ who -w
```

- b) Display /etc/shadow file using cat command & understand the importance of shadow file. How its difficult than password file.

→ cat /etc/shadow

As with the password file, each field in the shadow file is also separated with ":" colon character, and file as follows:

- username, up to 8 characters: case-sensitive, usually all lowercase. A direct match to the username in the /etc/passwd file.
- password, 13 characters encrypted. A blank entry (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, 1970) since the password was last changed.
- The number of days before password may be changed (indicates it may be changed at any time)
- The number of days after which password must be changed (eg: 9999 indicates user can keep his own 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.

A reserved field for possible future use



Each field in a passwd entry is separated with ":" colon characters, and are all lowercase:

- username, up to 8 characters. case-sensitive, usually all lowercase.
- An "x" in the password field. passwords are stored in "/etc/shadow" file.
- Numeric user id. This is assigned by the "adduser" script. Once set this field, put the following group field to identify which field belong to the user.
- Numeric group id. Did that user group id is 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 20 characters).

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- user's home directory. usually /home/username (eg /home/fsmith). All user's personal files, web pages, mail forwarding etc will be stored here.
- user's "shell account". Often set to "/bin/bash" to provide access to the bash shell (my personal favorite shell).

(my personal favorite shell).

```
jebajeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/sh
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/usr/sys:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:160:games:/usr/games:/usr/sbin/nologin
man:x:6:14:man:/var/man:/usr/sbin/nologin
lpd: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/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  
→ Pwd.

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

- d) Explain different ways of getting command history.  
how to run previously executed command without typing it.  
→ history

line number

line number

```
jebajeba@jeba-VirtualBox:~$ history
jebajeba@jeba-VirtualBox:~$ who
jebajeba@jeba-VirtualBox:~$ whoami
jebajeba@jeba-VirtualBox:~$ clear
jebajeba@jeba-VirtualBox:~$ w
jebajeba@jeba-VirtualBox:~$ w+
jebajeba@jeba-VirtualBox:~$ w-
jebajeba@jeba-VirtualBox:~$ w+
jebajeba@jeba-VirtualBox:~$ cat /etc/shadow
jebajeba@jeba-VirtualBox:~$ clear
jebajeba@jeba-VirtualBox:~$ cat /etc/passwd
jebajeba@jeba-VirtualBox:~$ pkill
jebajeba@jeba-VirtualBox:~$ clear
jebajeba@jeba-VirtualBox:~$ history
jebajeba@jeba-VirtualBox:~$ exit
jebajeba@jeba-VirtualBox:~$ ttys
jebajeba@jeba-VirtualBox:~$
```

- e) Create alias to most commonly used command.  
Add command instances the shell, to replace one string with another string while executing the command.  
→ Alice fabul = "Command".

Ans: alias label = command

```
jebajeba@jeba-VirtualBox:~$ alias m='mkdir -p'
jebajeba@jeba-VirtualBox:~$ n
jebajeba@jeba-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Templates
Documents examples.desktop JJ new Public Videos
jebajeba@VirtualBox:~$
```

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Practical No. 7

a) Create, modify, search & navigate a file in editor

i) Creating a file:

To create a file, on the terminal type or 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	Move cursor up
j	Move cursor down
h	Move cursor left
l	Move cursor right

## word Navigation

Key	Action
b	Move back to the beginning of the word.
e	Move forward to the end of the word.
w	Move forward to the beginning of the word.
o (two)	Move to first character of a line.
g	Move to the end of line.

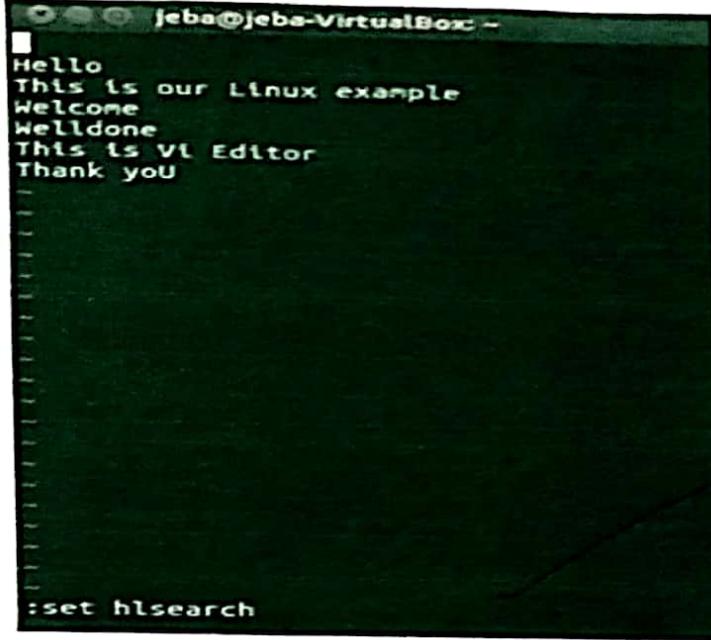
## scrolling

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

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

i) Replace

Syntax: /g /word to be replaced /s "new word/g.



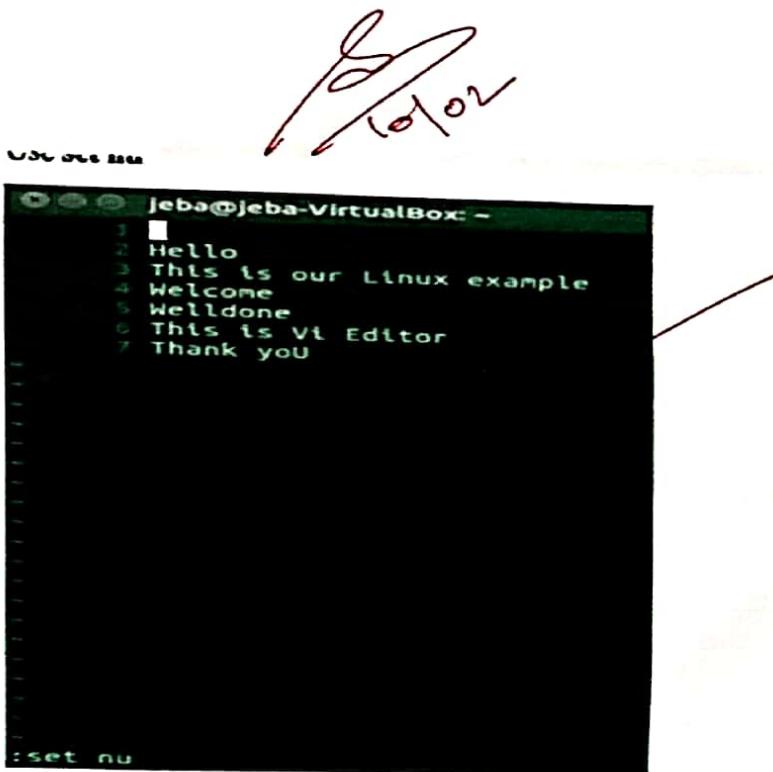
```
jeba@jeba-VirtualBox: ~
Hello
This is our Linux example
Welcome
Welldone
This is VI Editor
Thank you
-
: set hlsearch
```

ii) highlight

we set hlsearch

iii) show the line number.

we set nu.



*Motor*

```
user@user: ~
jeba@jeba-VirtualBox: ~
1 Hello
2 This is our Linux example
3 Welcome
4 Welldone
5 This is VI Editor
6 Thank you
-
: set nu
```

iii) Show the five number  
use sethu.

- b) Identify operations that requires sudo privileges.

b) Identify operations that require sudo privileges

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

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

```
jebaga@jebaga-VirtualBox:~$ sudo chage -l 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
```

```
jabegjeba@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 [9999]: 200  
Last Password Change [(YYYY-MM-DD): 2020-01-20]: 2020-01-21  
Password Expiration Warning [:7]: 5  
Password Inactive [:1]:  
Account Expiration [(YYYY-MM-DD): -1]: 2020-01-31  
jabegjeba@virtualbox:~$ sudo chage -l user1  
  
last password change : Jan 21, 2020  
Password expires : Aug 06, 2020  
Password Inactive : never  
account expires : Jan 31, 2020  
maximum number of days between password change : 100  
maximum number of days between password change : 200  
number of days of warning before password expires : 5  
jabegjeba@virtualbox:~$
```

```
jeb@jeb-VirtualBox:~$ sudo chage -E 25/01/2020 -m 10 -W 90 -I 30 -R 30 user1
jeb@jeb-VirtualBox:~$ sudo chage -l user1
Last password change                                : Jan 21, 2020
Password expires                                    : Apr 20, 2020
Password must change after   (days)                : 90
Account expires                                     : Jan 01, 2022
Minimum number of days between password change    : 10
Maximum number of days between password change    : 90
Number of warnings before password expires        : 30
jeb@jeb-VirtualBox:~$
```

- E- Expiration date.
  - m- minimum number of days before password change.
  - N- Number of days password is valid.
  - I- Account inactive.
  - W- Number of days of warning before password change if user failed.

- 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: ~$
```

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

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### Practical No. 9.

#### Network management

a) Get IP address of your machine using ifconfig.

a) Get IP address of your machine using ifconfig

```
jebajeba@jeba-VirtualBox:~$ ifconfig
enp0s3      Link encap:Ethernet HWaddr 00:0c:9e:cb:69
inet addr:10.0.2.15 Bcast:10.0.2.255 Mask:255.255.255.0
      inet brd:10.0.2.255 brd:10.0.2.255 mask:255.255.255.0
      inet netm:10.0.2.15 brd:10.0.2.255 mask:255.255.255.0
      RX packets:73 errors:0 dropped:0 overrun:0 frame:0
      TX packets:73 errors:0 dropped:0 overrun:0 carrier:0
      collisions:0 txqueuelen:1000
      RX bytes:1106 (1.1 KB)  TX bytes:8518 (8.5 KB)

lo          Link encap:Local Loopback
inet brd:127.0.0.1 Mask:255.0.0.0
      inet netm:127.0.0.1 brd:127.0.0.1 mask:255.0.0.0
      RX packets:53240 errors:0 dropped:0 overrun:0 frame:0
      TX packets:53240 errors:0 dropped:0 overrun:0 carrier:0
      collisions:0 txqueuelen:1
      RX bytes:4225072 (4.2 MB)  TX bytes:4225072 (4.2 MB)
```

Output

b) Get hostname of your machine.

as of your machine

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

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d) Use ping to check the network connectivity to Remote machine.

c) Use ping to check the network connectivity to Remote machine

```
jebajeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=32.0 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=45.9 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=54.0 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=87.1 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=31.5 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=60.9 ms
64 bytes from maad3s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=20.9 ms
...
[1]: stopped           ping www.google.com
```

d) Use of dig command

d) Use of dig command

```
jebajeba@jeba-VirtualBox:~$ dig www.google.com
; <>> DLG V.1.0.0-14ubuntu <>> www.google.com
; global options: +cmd
; Got answer:
; ->>HEADER: opcode: QUERY, status: NCZRUR, 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  172.217.106.100
; Query time: 152 msec
; SERVER: 127.0.1.1#53((127.0.1.1))
; WHEN: Sun Jan 24 22:40:06 IST 2020
; MSG SIZE rcvd: 59
```

a) Troubleshooting network using terminal, route command

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e) troubleshooting network using traceroute, route command.

```
jebajeba@jeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets
1 10.0.2.0 (10.0.2.0) 0.190 ms 0.143 ms 0.151 ms
2 10.0.2.2 (10.0.2.2) 68.568 ms 68.486 ms 68.405 ms
jebajeba@jeba-VirtualBox:~$
```

```
jebajeba@jeba-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway      Genmask      Flags Metric Ref    Use Iface
0.0.0.0         0.0.0.0      0.0.0.0      U     0      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
jebajeba@jeba-VirtualBox:~$
```

f) use of arp command.

D) Use of arp command

```
jebajeba@jeba-VirtualBox:~$ arp
Address          Htype  Paddress          Flags Mask           Iface
10.0.2.2        ether   52:54:00:12:35:02  C       enp0s3
```

g) Use of host command.

```
jebajeba@jeba-VirtualBox:~$ host -V
host version 3.9.4-ubuntu
jebajeba@jeba-VirtualBox:~$
```

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h) use of netstat command & Nmap command.

```
jebajeba@jeba-VirtualBox:~$ netstat -an | grep ':/w servers'
Proto Recv-Q Send-Q Local Address          Foreign Address        State
proto unix: 0 0 :/w servers
proto unix: 0 0 :/w servers
jebajeba@jeba-VirtualBox:~$
```

```
jebajeba@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 (206.59.196.68)
Host is up (0.000s latency).
Other addresses for www.google.com (not scanned): 2404:6800:4807:8111::2004
DNS record for 206.59.196.68: bond0$11-in-f4.1.e100.net
Not shown: 998 closed 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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10/10/2020

### Practical No. 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 -t is called shebang . It is written at the top of a shell script and it pass the instruction to the program /bin/bash .

Echo \$ shell

```
root@tesc-VirtualBox:~# echo $shell
bash
```

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

```
root@tesc-VirtualBox:~# vi filename.sh
#!/bin/bash
echo "THIS IS LINUX!"
```

chmod 777 filename.sh  
./filename.sh

```
root@tesc-VirtualBox:~# chmod 777 filename.sh
root@tesc-VirtualBox:~# ./filename.sh
THIS IS LINUX!
```

Step to write & 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 favorite editor, to edit the script ]
- chmod 777 filename .sh [for making the script executable]
- 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 " .

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```

$ sum=5
$ echo $sum
5
Enter your name?
My name is RAMU
$ name
$ echo $name
RAMU
$ 
```

Program to find the sum of two variables.

```

vi tename.sh
#!/bin/bash
a=100
b=55
sum=$((a+b))
echo "sum is : $sum"

```

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program to find the sum of 2 numbers (value passed during execution)

```

$ ./tname.sh
tsc@tsc-VirtualBox:~$ sh tname.sh
tsc@tsc-VirtualBox:~$ 111 222
tsc@tsc-VirtualBox:~$ ./tname.sh
tsc@tsc-VirtualBox:~$ ./tname.sh 111 222
sum is 333
tsc@tsc-VirtualBox:~$ 
```

```

$ ./tname.sh
tsc@tsc-VirtualBox:~$ sh tname.sh
tsc@tsc-VirtualBox:~$ 111 222
tsc@tsc-VirtualBox:~$ ./tname.sh
tsc@tsc-VirtualBox:~$ ./tname.sh 111 222
sum is 333
tsc@tsc-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 text manipulation like insertion, deletion, search, etc.

With sed, we can edit complete file without actually having to open it.

```
less@less-VirtualBox ~
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
```

## i) Displaying partial text of a file:

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

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

## ii) Display all except some lines:

To display all content of a file except from some position, use option 'd'.

```
less@less-VirtualBox ~
subjects offered in cs
datastructure
green tech
softskill
stats
calculus
computer basic
less@less-VirtualBox:~$
```

## iii) Deleting a line

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

```
● - P less@less-VirtualBox ~
less@less-VirtualBox:~$ vi linux.sh
less@less-VirtualBox:~$ vi ./linux.sh
THIS IS LINUX!
less@less-VirtualBox:~$ ./linux.sh
less@less-VirtualBox:~$
```

- 4) Search & replacing a string  
 's' option is for searching a word

```
tsc@tsc-VirtualBox:~$ sed 's/cs/computer/' cs.txt
subjects offered in cs
datastructure
database management
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, use line number with 's' option.

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

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

```
tsc@tsc-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
calculus
computer basic
tsc@tsc-VirtualBox:~$
```

- To change a whole line with matched pattern.

To change a whole line to a new line when a search pattern matched, use option 'c'.

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

### 8) Appending lines

To add some content before every line with sed,  
use & and & all POCOOS.

```
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 calculus
Thanks computer basic
```

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