Exam Seat No._____

THAKUR COLLEGE OF SCIENCE & COMMERCE

NAAC Accredited with Grade "A" (3rd Cycle)

THAKUR TRUSTS

ISO 9001 : 2015 Certified

Degree College

Computer Journal

CERTIFICATE

SEMESTER 2 **UID No.** _____

Class FYCS (A) **Roll No.** 1705 **Year** 2019 - 20

This is to certify that the work entered in this journal is the work of Mst. / Ms. Ayushmaan Karmokar.

who has worked for the year 19-20 in the Computer Laboratory.

Teacher In-Charge

Head of Department

Date : _____

Examiner

No.	
1.	Id
	a
2.	ka
	lic
3.	Co
4.	Fl
5.	Wo
6.	Gi
7.	Vi
8.	Vi

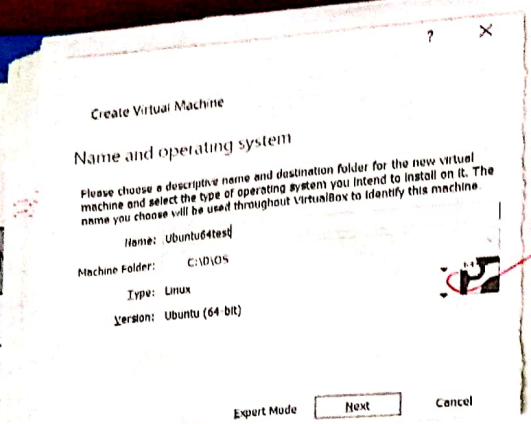
Scanned with CamScanner

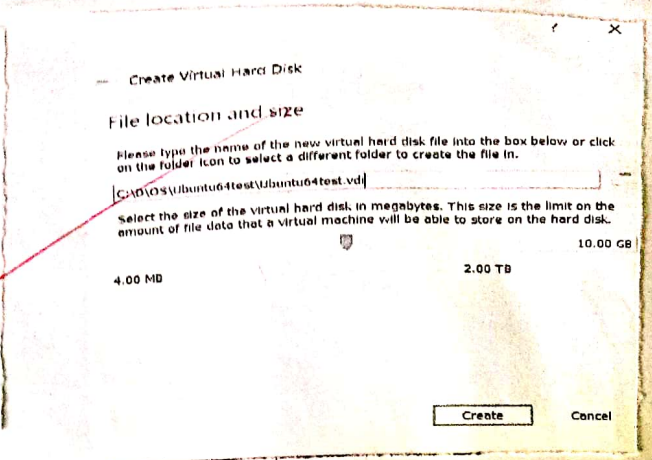
☆☆ INDEX ☆☆

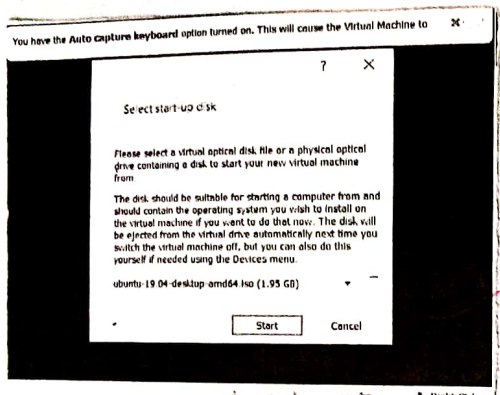
Semester 2:

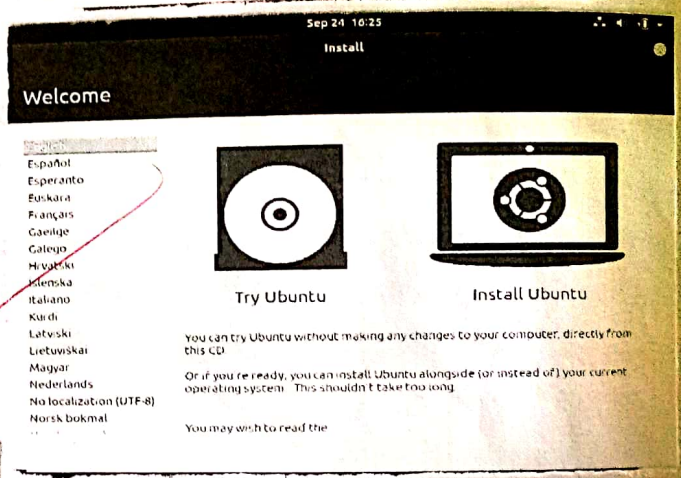
No.	Title	Page No.	Date	Staff Member's Signature
1.	Installing Linux Distribution.	17.	13.11.19	
2.	Installing & Removing of Software.	19.	23.12.19	
3.	Linux Commands Documentation.	21.	23.12.19	
4.	Linux Commands.	23.	4.1.20	28/01
5.	File Operations	25.	4.1.20	
6.	Use Environment.	27.	11.1.20	
7.	Linux Editors: vi	29.	11.1.20	01/02
8.	Linux Security	31.	18.1.20	
9.	Network.	33.	18.1.20	11/02
10.	Shell Scripting & Stream Editor.	35.	8.2.20	

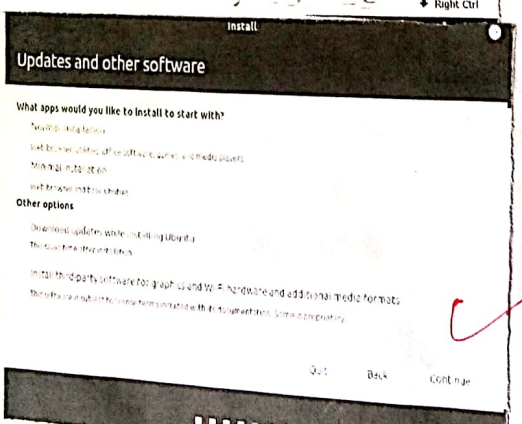
Scanned with CamScanner

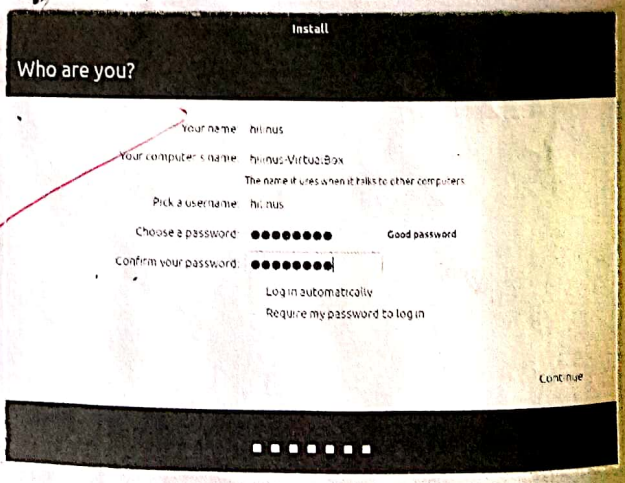


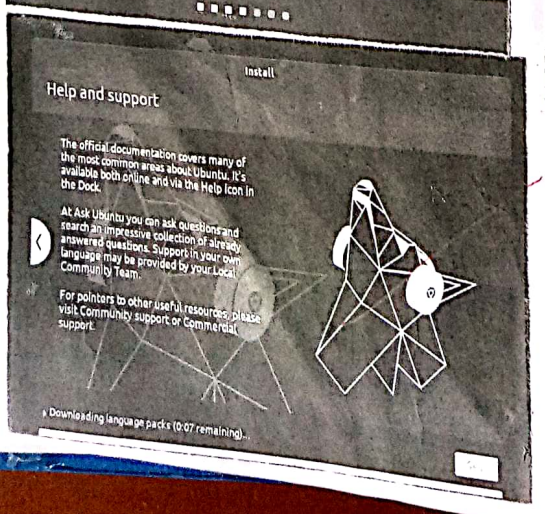












Aim:

* Ubuntu
Linux
having
release
It is
with

* Steps

① Open
the VM
memory

② Click
and
Install

③ Click n
coming

④ Finally
system

⑤ Now U

Scanned with CamScanner

: Practical 1 :

Aim: Install your choice of Linux Distribution, Ubuntu.

* Ubuntu is a free and open source software based on Linux Kernel, released under 2 editions Desktop & Server, having LTS as long term release and a standard release.
It is a popular software among coders, cloud compute with support for openstack.

* Steps to install VirtualBox Ubuntu in

① Open VirtualBox, click on New, and set up to create the virtual machine by adding saving location, memory size and virtual hard disk.

② Click on start, add location of Ubuntu Disk Image and start, later as Ubuntu is initialized click on Install Ubuntu (Safe Graphics)

③ Click next and go through all the default option, finally coming to install now. Let the system install Ubuntu.

④ Finally add your defined username & password, let the system set-up your ubuntu installation.

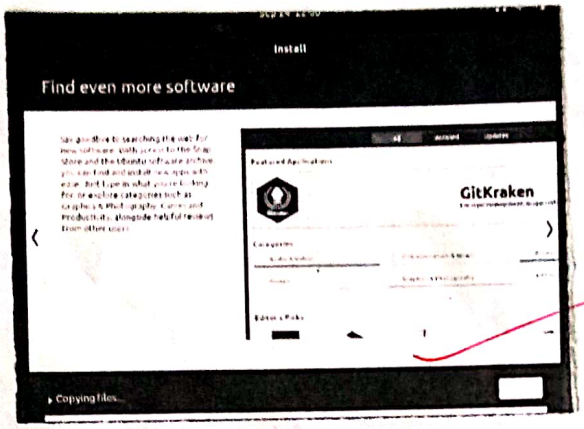
⑤ Your Ubuntu Distribution is installed on your VM. Hit restart.

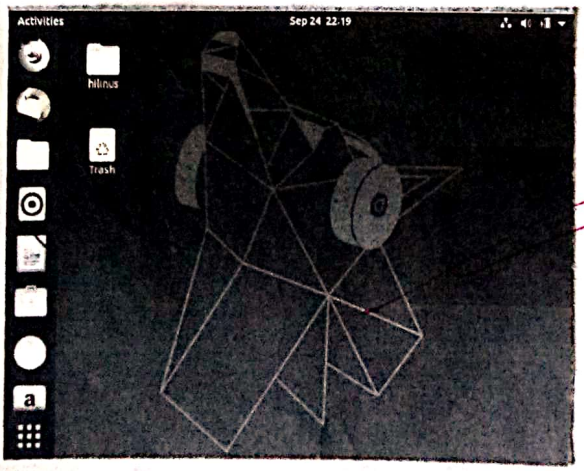
b) Customize desktop environment by changing different default options like changing default background, themes, screensaver.

① Click on 'show application', select 'settings', click on 'background'. select your desired wallpaper, and choose whether you want to set as lock-screen or background.

② If you would like to change the resolution, on setting, click on display, change to your desired resolution.

18/01





18/01

Scanned with CamScanner

: Practical 2 :

Aim: Installing & Removing Software: and using some terminal commands.

* Installing 'gcc' package, verify that it runs then remove it.

① Type 'gcc -V', to should print the version of the gcc package installed in your terminal. If you don't see anything, that means 'gcc' is not installed.

② Enter in the terminal, 'sudo apt-get install gcc', the terminal will download and start the installation of gcc.

③ Enter: sudo apt-get install build-essential, this will install the required C & C++ programming lang. libraries.

④ Now type, 'gcc -V', you will see the version.

* To uninstall a program.

① Enter 'sudo apt-get remove gcc', this will remove all packages for gcc, alternatively you can also use 'purge' instead of remove.

18/01

: Practical 3 :

: Linux Commands :

: Documentation :

1. info :
2. ls : (man)
3. tar .
4. mkdir
5. printf
6. mkdir
7. grep

1. info main menu (aka directory mode).

2. ls - list directory contents.
List information about the FILE(s). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

3. tar - an archiving utility.
GNU tar an archiving program designed to store multiple files in a single file (an archive), and to manipulate such archives.

4. mkdir - make directories.
Create the Directory(ies), if do not already exists
Mandatory arguments to long options are mandatory for short options too.

Scanned with CamScanner

(5) printf - format and print data.
Print arguments according to format, or execute according to OPTION:
--help -- display help and exit.
--version -- output version and exit.

(6) zip - package and compress (archive) files.
zip is a compression and file package utility for Unix, VMS, MSDOS, OS/2. It is analogous to a combination of Unix Commands tar (1) and compress and is compatible with PKZIP.

(7) grep - print lines that match patterns.
grep searches for PATTERNS in each file. PATTERNS is one or patterns separated by newline characters, and grep prints each line that matches a pattern. A FILE of "-" stands for standard input. If no FILE is given, recursive searches examine the working directory, and non recursive searches.

Practical 4:

* Command Line Operation : Aim.

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 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/

d) Find the password file under root & one level down
find / -maxdepth 2 -name passwd.
• /etc/passwd

e) Find the password file under root & 2 level down.
find / -maxdepth 3 -name passwd.
• /usr/bin/passwd.
• /etc/pam.d/passwd.
• /etc/passwd

f) Create a symbolic link to the file you found in last step.
ln -s file1 file2

Scanned with CamScanner

ESO

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

touch example.txt

mv example.txt /tmp

h) delete the file moved to /tmp in prev abs mode

rm /tmp/example.txt.

i) Find the location of ls, ps, bash commands.

where is ls where is ls

ls : /bin /ls /usr /share /man /mal / ls. / .gz

where is ps where is ps

ps : /bin / ps / usr / share / maps / bin / ps / usr / share /

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

where is bash. where is bash.

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

18/01

```
jeba@jeba-VirtualBox:~$ mount
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,relatime)
udev on /dev type devtmpfs (rw,nosuid,relatime,size=4944136k,nr_inodes=123609,mode=755)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxmode=000)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,size=1024116k,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,noexec,relatime,size=5120k)
tmpfs on /run/lock type tmpfs (ro,nosuid,nodev,noexec,mode=755)
tmpfs on /sys/fs/cgroup type tmpfs (rw,nosuid,nodev,noexec,relatime,xattr,releas
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,release_
tmpfs on /run/user/1000 type tmpfs (rw,nosuid,nodev,noexec,relatime,size=1024116k,mode=700,
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot
=/)
cgroup on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net
_cls,net_prio,nsroot=/)
cgroup on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=/)
cgroup on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsro
ot=/)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpua
cct,nsroot=/)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsro
ot=/)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot
=/)
cgroup on /sys/fs/cgroup/blkio type cgroup (rw,nosuid,nodev,noexec,relatime,blkio,nsroot=/
)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_even
t,nsroot=/)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsro
ot=/)
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgrp=1,timeout=0,minp
roto=5,maxproto=5,direct)
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

```
Documents  examples.desktop  jj  Pictures  Templates
jeba@jeba-VirtualBox:~$ cd jeb
jeba@jeba-VirtualBox:~/jeb$ cat .gg.txt
cat: .gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat >gg.txt
welcome
Linux
^C
jeba@jeba-VirtualBox:~/jeb$ touch dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  gg.txt
jeba@jeba-VirtualBox:~/jeb$ cp gg.txt dd.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$
```

```
jeba@jeba-VirtualBox:~/jeb$ touch ss.txt
jeba@jeba-VirtualBox:~/jeb$ mv gg.txt ss.txt
jeba@jeba-VirtualBox:~/jeb$ cat gg.txt
cat: gg.txt: No such file or directory
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt
welcome
Linux
jeba@jeba-VirtualBox:~/jeb$
```

```
jeba@jeba-VirtualBox:/$ tar -cvf data.tar /mnn
tar: data.tar: Cannot open: Permission denied
tar: Error is not recoverable: exiting now
jeba@jeba-VirtualBox:/$ sudo tar -cvf data.tar /mnn
tar: Removing leading '/' from member names
/mnn/
/mnn/hd/
jeba@jeba-VirtualBox:/$ ls
bin   data.tar  etc      lib     mnn   opt   run   srv  usr
boot  dd        home     lost+found  mnt   proc  sbin  sys  var
cdrom dev       initrd.img  media   mnt1  root  snap  tmp  vmlinuz
jeba@jeba-VirtualBox:/$ cat data.tar
mnn/0000755000000000000000000000000013605376557010365 5ustar  rootrootmnn/hd/0000755000000000
000000000000000000013605376557010760 5ustar  rootrootjeba@jeba-VirtualBox:/$
```

Aim: File

① df -k

```
jeba@jeba-Virtu
Filesystem
udev
tmpfs
/dev/sda1
tmpfs
tmpfs
tmpfs
tmpfs
jeba@jeba-Virtu
```

② Different wo
> mount

③ Copying text
> cp command

④ Archiving
gzip filena
bzip2 filen

⑤ Use diff ,
diff filena

Scanned with CamScanner

: Practical 5 :

Aim: File Operations.

① df -k (Explore mounted file sys on computer)

```
jeba@jeba-VirtualBox:~$ df -k
Filesystem     1K-blocks    Used Available Use% Mounted on
udev              494436       0    494436   0% /dev
tmpfs             102416    3676     98740   4% /run
/dev/sda1        7092728 3383372   3326024  51% /
tmpfs             512076     216    511860   1% /dev/shm
tmpfs               5120       4      5116   1% /run/lock
tmpfs             512076       0    512076   0% /sys/fs/cgroup
tmpfs             102416      48    102368   1% /run/user/1000
jeba@jeba-VirtualBox:~$
```

② Different ways of exploring mounted file systems in Linux?
> mount

③ Copying text from files
> cp command, mv command.

④ Archiving and backup, gzip, bzip2
gzip filename
bzip2 filename.

⑤ Use diff, to create diff of 2 files.
diff filename1 filename2

250

(6) Use patch command to patch a file. Analyze the patch command again.

```
jeba@jeba-Virtu
jeba@jeba-Virtu
dd.txt  ss.txt.
jeba@jeba-Virtu
BZh91AY&SY
'J◆wSS◆◆1 jeb
jeba@jeba-Virtu
dd.txt.gz  ss.t
jeba@jeba-Virtu
◆dd.txt+O◆I
```

```
jeba@jeba-Virtu
hello world
^C
jeba@jeba-Virtu
this is linux^C
jeba@jeba-Virtu
1d0
< hello world
jeba@jeba-Virtu
this is Linux
^C
jeba@jeba-Virtu
1c1
< hello world
---
> this is linux
jeba@jeba-Virtu
jeba@jeba-Virtu
jeba@jeba-Virtu
Binary files a
```

```
jeba@jeba-Virtual
hi
hi
hi
^C
jeba@jeba-Virtual
hello
hello
hello
^C
jeba@jeba-Virtual
jeba@jeba-Virtual
^C
jeba@jeba-Virtual
patching file hi
jeba@jeba-Virtual
--- hi.txt
+++ hii.txt
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-Virtual
```

Scanned with CamScanner

```
jeba@jeba-VirtualBox:~/jeb$ bzip2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY`◆[illegible]◆[illegible]
'J◆w$S◆◆[illegible]1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
◆[illegible]d.txt+O◆I◆◆M◆◆◆◆+◆◆[illegible]◆Xzjeba@jeba-VirtualBox:~/jeb$
```

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

```
jeba@jeba-VirtualBox:~/jeb$ cat >hi.txt
hi
hi
hi
^C
jeba@jeba-VirtualBox:~/jeb$ cat >hii.txt
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/jeb$ diff -u hi.txt hii.txt >sam.patch
jeba@jeba-VirtualBox:~/jeb$ patch ,sam.patch
^C
jeba@jeba-VirtualBox:~/jeb$ patch <sam.patch
patching file hi.txt
jeba@jeba-VirtualBox:~/jeb$ cat sam.patch
--- hi.txt      2020-01-08 22:14:55.463569834 +0530
+++ hii.txt     2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-hi
-hi
-hi
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/jeb$
```

01/02

Scanned with CamScanner

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ who
jeba     tty7         2020-01-15 20:32 (:0)
jeba@jeba-VirtualBox:~$ whoami
jeba
jeba@jeba-VirtualBox:~$ who -l                                    780 id=tty1
LOGIN    tty1         2020-01-15 20:30
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ w
 20:35:04 up 4 min,  1 user,  load average: 0.70, 0.79, 0.38
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
jeba     tty7     :0               20:32    4:28   8.19s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -s
 20:35:14 up 4 min,  1 user,  load average: 0.60, 0.77, 0.37
USER     TTY      FROM              IDLE WHAT
jeba     tty7     :0                4:38  /sbin/upstart --user
jeba@jeba-VirtualBox:~$ w -h
jeba     tty7     :0               20:32    4:44   8.67s  0.33s /sbin/upstart -
jeba@jeba-VirtualBox:~$ w -f
 20:36:12 up 5 min,  1 user,  load average: 0.41, 0.69, 0.37
USER     TTY      LOGIN@   IDLE   JCPU   PCPU WHAT
jeba     tty7     20:32    5:36   9.00s  0.33s /sbin/upstart --user
```

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[sudo] password for jeba:
root:!:18240:0:99999:7:::
daemon:*:16911:0:99999:7:::
bin:*:16911:0:99999:7:::
sys:*:16911:0:99999:7:::
sync:*:16911:0:99999:7:::
games:*:16911:0:99999:7:::
man:*:16911:0:99999:7:::
lp:*:16911:0:99999:7:::
mail:*:16911:0:99999:7:::
news:*:16911:0:99999:7:::
```

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
```

(a) Account logge
> who
> whoami

(b) Display /etc/
the Imporon
passwd file.
Ans cat /etc/s
As with the
is separated
→ Usrname, up
etc/passwd
→ Password,
Password
→ Number o
→ 99999 f
years.
→ Saved f

cat /etc/
→ ~~Case~~ Usrn
→ "x" in p
→ Numeric
→ Full Nam
→ Usr hom
→ Usr's s

Scanned with CamScanner

: Practical 6 :

: Use Environment :

(a) Account logged in ? find out ? -
> who
> whoami

(b) Display /etc/shadow file using cat command & understand the importance of shadow file. How its different than passwd file.

Ans cat /etc/shadow
As with the passwd file, each field in the shadow file is separated by : , as follows:
→ Username, upto 8 char, case sensitive, direct match to etc/passwd file.
→ Password, 13 char encrypted. A blank entry (eg ::) indicates Password not required to log in.
→ Number of Days since password was last changed.
→ 99999 indicates password not changed for many years.
→ Reserved field.

cat /etc/passwd
→ ~~Case~~ Username, 8 char ; Case - sensitive.
→ "x" in Password field ; password stored in /etc/shadow
→ Numeric user id assigned by 'adduser' script.
→ Full Name of User. (30 char)
→ User home directory (eg /home/smith/)
→ User's shell account, often set to (/bin/bash/)

(c) Get current working directory.
> pwd

(d) command history, !line.
> history
> ! line number.

(e) Create alias to most commonly used commands.
> alias label = "command"

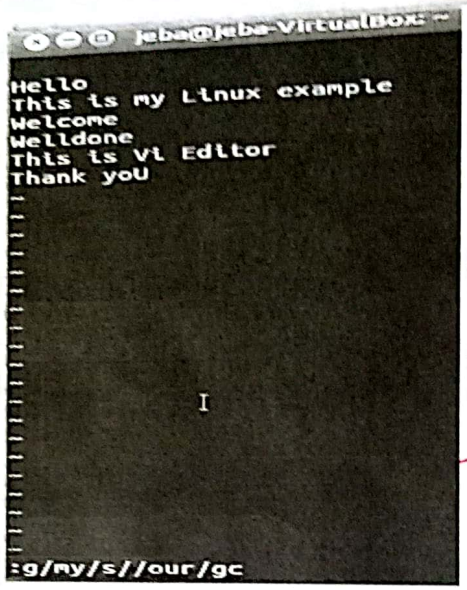
Scanned with CamScanner

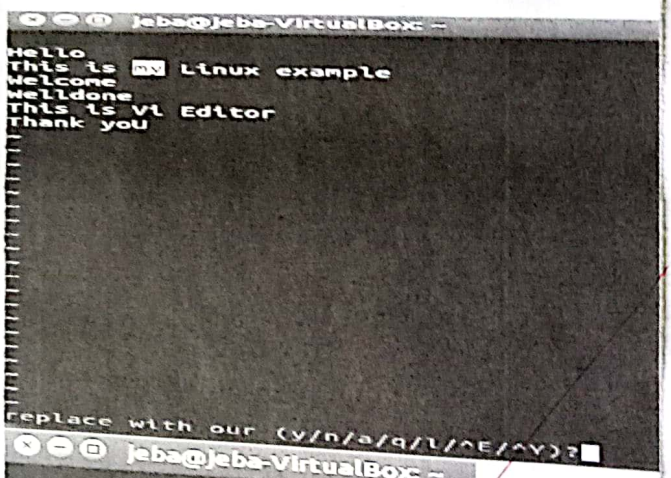
```
jeba@jeba-VirtualBox:~$ pwd
/home/jeba
jeba@jeba-VirtualBox:~$
```

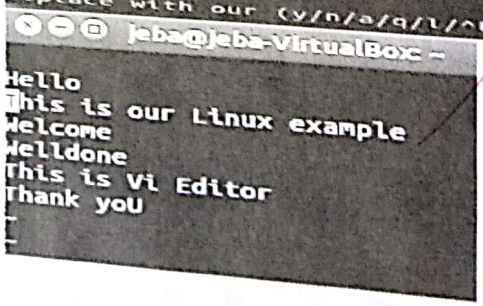
```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ history
    1  who
    2  whoami
    3  who -l
    4  clear
    5  w
    6  w -s
    7  w -h
    8  w -f
    9  clear
   10  cat /etc/shadow
   11  sudo cat /etc/shadow
   12  clear
   13  sudo cat /etc/passwd
   14  pwd
   15  clear
   16  history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

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

01/02







Scanned with CamScanner

: Practical 7 :

Linux Editors : Vi

a) Create, Modify, search & navigate a file in editor.

(i) Creating a file

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

(ii) Modifying the file

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

(iii) Search in a file

Press / followed by word to search.

(iv) Navigate

Movement in 4 direction

Key	Action
K	UP
J	DOWN
H	LEFT
L	RIGHT

WORD NAVIGATE

Key	ACTION
b	move to begin of word (back)
e	move to end of word (forward)
w	move to begin of word (forward)
0 (zero)	move to first char of line
$	move to end of line.

Scanned with CamScanner

-a Scrolling

Key	Action
ctr + f	Scroll forward
ctr + b	Scroll backward
ctr + d	Scroll half-page
ctr + u	Scroll half-page backward.

(b) Learn commands like search/replace, highlight, etc.

(i) Replace

:/g/word replaced / S // new word / gc

(ii) Highlight

Use set hsearch.

Scanned with CamScanner

```
Hello
This is our Linux example
Welcome
Welldone
This is Vi Editor
Thank you
~
~
~
```

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

# Host alias specification

# User alias specification

# Cmnd alias specification

# User privilege specification
root    ALL=(ALL:ALL) ALL

user1   ALL=(ALL:ALL) ALL
```

```
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
```

Scanned with CamScanner

: Practical 8 :

Linux Security:

Q. Use sudo to change user privileges to root.

→ Create a user named user1

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

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

→ Identify operations that require sudo privileges.

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

→ Modify expiration date for new user using passwordaging.

Scanned with CamScanner

```
jeba@jeba-VirtualBox:~$ sudo chage user1
Changing the aging information for user1
Enter the new value, or press ENTER for the default

        Minimum Password Age [0]: 100
        Maximum Password Age [99999]: 200
        Last Password Change (YYYY-MM-DD) [2020-01-20]: 2020-01-21
        Password Expiration Warning [7]: 5
        Password Inactive [-1]:
        Account Expiration Date (YYYY-MM-DD) [-1]: 2020-01-31
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change                                    : Jan 21, 2020
Password expires                                        : Aug 08, 2020
Password inactive                                       : never
Account expires                                         : Jan 31, 2020
Minimum number of days between password change          : 100
Maximum number of days between password change          : 200
Number of days of warning before password expires       : 5
jeba@jeba-VirtualBox:~$
```

- E : Expiration Date
- M : Minimum No. of days before password change.
- M : Minimum no. of days password is valid.
- I : Account Inactive.
- W : Minimum no. days before pass change is req.

```
jeba@jeba-VirtualBox:~$ sudo chage -E 25/01/2020 -m 10 -M 90 -I 30 -W 30 user1
jeba@jeba-VirtualBox:~$ sudo chage -l user1
Last password change                                    : Jan 21, 2020
Password expires                                        : Apr 20, 2020
Password inactive                                       : May 20, 2020
Account expires                                         : Jan 01, 2022
Minimum number of days between password change          : 10
Maximum number of days between password change          : 90
Number of days of warning before password expires       : 30
jeba@jeba-VirtualBox:~$
```

- 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:~$
```

Scanned with CamScanner

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ ifconfig
enp0s3    Link encap:Ethernet  HWaddr 08:00:27:0e:6b:69
          inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
          inet6 addr: fe80::c0cd:53a0:d5a3:848e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:73 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1180 (1.1 KB)  TX bytes:8518 (8.5 KB)

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

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=
97.8 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=
82.0 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=
84.8 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=
87.1 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=
93.5 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=
86.9 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=
98.0 ms
64 bytes from naa03s28-in-f4.1e100.net (172.217.31.196): icmp_seq=8 ttl=54 time=
90.9 ms
^Z
[1]+  Stopped                 ping www.google.com
jeba@jeba-VirtualBox:~$
```

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

; <<>> DiG 9.10.3-P4-Ubuntu <<>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52868
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.google.com.                IN      A

;; ANSWER SECTION:
www.google.com.         91      IN      A       172.217.166.100

;; Query time: 152 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Jan 20 22:40:06 IST 2020
;; MSG SIZE  rcvd: 59

jeba@jeba-VirtualBox:~$
```

(a) Get I

(b) Get

(c) Use
remo

(d) Use

Scanned with CamScanner

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ ifconfig
enp0s3    Link encap:Ethernet  HWaddr 08:00:27:0e:6b:69
          inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
          inet6 addr: fe80::c0cd:53a0:d5a3:848e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:73 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1180 (1.1 KB)  TX bytes:8518 (8.5 KB)

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

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

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

; <<>> DiG 9.10.3-P4-Ubuntu <<>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52068
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.google.com.                IN      A

;; ANSWER SECTION:
www.google.com.         91      IN      A       172.217.166.100

;; Query time: 152 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Jan 20 22:40:06 IST 2020
;; MSG SIZE  rcvd: 59

jeba@jeba-VirtualBox:~$
```

(a) Get IP -

(b) Get hos

(c) Use ping remote

(d) Use th

Scanned with CamScanner

: Practical 9 :

: Network Management :

(a) Get IP-Address of your machine using ifconfig.

(b) Get hostname of your machine.

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

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

(d) Use the 'dig' command.

Scanned with CamScanner

(e) Troubleshoot network using traceroute command.

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ traceroute www.google.com
traceroute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.190 ms  0.143 ms  0.151 ms
 2  * * *
 3  10.0.2.2 (10.0.2.2)  68.568 ms  68.486 ms  68.405 ms
jeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         10.0.2.2        0.0.0.0         UG    100    0        0 enp0s3
10.0.2.0        *               255.255.255.0   U     100    0        0 enp0s3
link-local      *               255.255.0.0     U     1000   0        0 enp0s3
jeba@jeba-VirtualBox:~$
```

(f) Use of ARP command.

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ arp
Address                  HWtype  HWaddress           Flags Mask            Iface
10.0.2.2                 ether   52:54:00:12:35:02   C                     enp0s
3
```

(g) Use of host command.

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

(h) Use netstat & Nermap command.

```
jeba@jeba-VirtualBox: ~
jeba@jeba-VirtualBox:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ]         DGRAM                    42149    /run/user/1000/system
d/notify
unix  2      [ ]         DGRAM                    9694     /run/systemd/journal/
syslog
unix  16     [ ]         DGRAM                    9695     /run/systemd/journal/
dev-log
unix  7      [ ]         DGRAM                    9704     /run/systemd/journal/
socket
unix  3      [ ]         DGRAM                    9684     /run/systemd/notify
unix  3      [ ]         STREAM     CONNECTED     44042    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     43331
unix  3      [ ]         STREAM     CONNECTED     42988    @/tmp/dbus-CymTeI7AQG
unix  3      [ ]         STREAM     CONNECTED     42690    @/tmp/dbus-CMGGc6G7P5
unix  3      [ ]         STREAM     CONNECTED     13242    /run/systemd/journal/
stdout
unix  3      [ ]         STREAM     CONNECTED     43113    /run/systemd/journal/
stdout
unix  3      [ ]         STREAM     CONNECTED     43013
unix  3      [ ]         STREAM     CONNECTED     42935
```

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

Starting Nmap 7.01 ( https://nmap.org ) at 2020-01-20 22:51 IST
Nmap scan report for www.google.com (216.58.196.68)
Host is up (0.044s latency).
Other addresses for www.google.com (not scanned): 2404:6800:4007:811::2004
rDNS record for 216.58.196.68: bom05s11-in-f4.1e100.net
Not shown: 998 filtered ports
PORT    STATE SERVICE
80/tcp  open  http
443/tcp open  https

Nmap done: 1 IP address (1 host up) scanned in 20.32 seconds
jeba@jeba-VirtualBox:~$
```

Scanned with CamScanner

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

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

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

```
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:~$
```

⇒ Basic of
ⓐ To
ⓑ To
ⓒ In
na
ⓓ The
ⓔ #!
top
pu

Echo
o

#! /bin
echo "

Steps
Shell
ⓐ
ⓑ
ⓒ
ⓓ
ⓔ
ⓕ

Scanned with CamScanner

: Practical 10 :

Shell Scripting & Sed.

→ 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 stand for shell variable.
ⓓ The echo command prints to console.
ⓔ #!/bin/bash → is called shebang, written at the top of a shell script & passes instruction to the program /bin/bash.

Echo $SHELL
- vi filename.sh

#!/bin/bash
echo "This is Linux!"
- chmod 777 filename.sh
- (./filename.sh)

Steps to write & execute a shell script:
Shell scripting is just a simple text file with .sh ext.

ⓐ Open terminal.
ⓑ Navigate to place, where you want to create script.
ⓒ Touch filename.sh
ⓓ Nano filename.sh
ⓔ Chmod 777 filename.sh
ⓕ sh filename.sh , ./filename.sh

* Program to display your name.

```
#!bin/bash
echo "Name"
Read name
echo "Name: $name"
```

* Program to find sum of 2 variables.

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

* Programs to find sum by passing values.

```
sum= $(($1 + $2))
echo "$sum"
```

```
> ./file.sh 50 50
```

⇒ SED (Stream Editor)

Sed command is a very powerful utility offered by Linux systems, mainly used for text substitution find & replace but it can perform other text manipulation like insertion, deletion, search, etc. with sed we can edit files without opening it.

* Consider following text file.

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

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

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

```
tcsc@tcsc-VirtualBox: ~
#!/bin/bash
sum=$(($1+$2))
echo "sum is:$sum"
```

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

```
tcsc@tcsc-VirtualBox:~$ vi lin.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh
tcsc@tcsc-VirtualBox:~$ ./lin.sh 50 70
sum is:120
tcsc@tcsc-VirtualBox:~$
```

Scanned with CamScanner

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

```
tcsc@tcsc-VirtualBox:~$ sed 3,5d cs.txt
subjects offered in cs
datastructure
green tech
softskill
stats
calclus
computer basic
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:~$ sed 's/cs/computer/' cs.txt
subjects offered in computer
datastructure
database management
linux
python
green tech
softskill
stats
calclus
computer basic
```

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

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

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

(1) Display

(2) Display

(3) Delet

(4) Searc

(5) Repla

(6) Add

Scanned with CamScanner

① Display partial text of a file.

② Display all except some lines.

③ Deleting a line.

④ Search & Replacing a string ('s')

⑤ Replace a string on a particular line.

⑥ Add a line After/Before the matched string 'a'

'a' → after pattern match

'i' → before pattern match.

Scanned with CamScanner

580

⑦ change whole line with match pattern. ('c')

⑧ Appending lines (+) AND (&)

Scanned with CamScanner

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

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

11/5

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

Scanned with CamScanner