

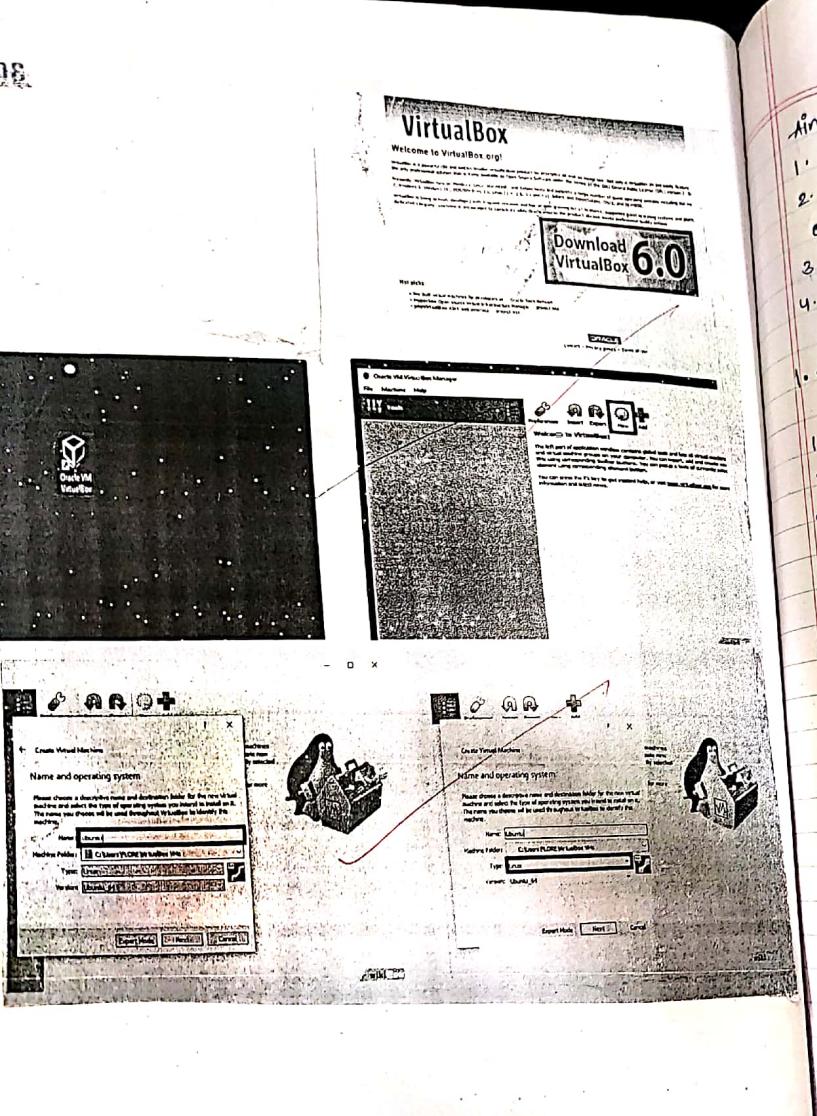
## Practical 1

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- Aim: To install your choice of Linux distribution eg Ubuntu, Fedora  
1. Install your choice of Linux distribution eg Ubuntu, Fedora  
2. Customize desktop environment by changing different default options like changing default background, themes, screensavers  
3. Screen Resolution  
4. Time Settings

Steps for installation of Ubuntu on Virtual Box:

1. Install Virtual Box
2. Open VirtualBox: Double click the VirtualBox app icon
3. Click new, it's a blue badge in the upper left corner. The VirtualBox window, doing so opens a pop-up menu.
4. Enter a name for your virtual machine. Type whatever you want to name your VM (eg ubuntu) into the "Name" text field that's near the top of the pop up menu.
5. Select Linux as the "Type value". Click the "Type" drop-down box, then click Linux in the resulting drop down menu.
6. Select Ubuntu as the "Version" value: Ubuntu should be selected by default after you set the "Type" value to Linux but if it's not, click the "Version" drop-down box & click Ubuntu (64-bit) before proceeding.
7. Click next: It's at the bottom of the menu.
8. Select an amount of RAM to use: Click drag the slider left or right to decrease or increase the amount of RAM.
9. The ideal amount of RAM will automatically be selected when you get to this page.



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- make sure not to increase the RAM into the red section of slides.
- 9: Click Next: It's at the bottom of the menu.
  - 10: Create your own virtual machines. Virtual hard disk & drives. The virtual hard drives in the section of your computers hard drives space which will use to be stored in your Virtual machine's file & program:

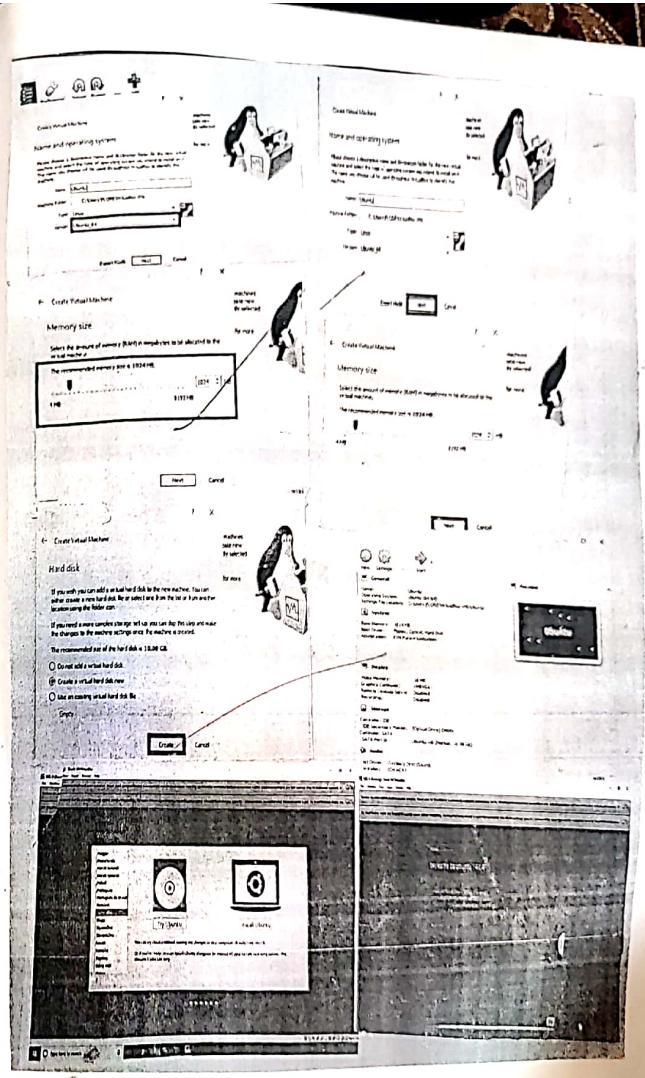
- Click Create Virtual Machine for virtual machine creation.
- Click Next
- Click Next

#### Ubuntu Installation

- Select an amount of space to use for a Ubuntu image.
- Click Create
- 11: make sure that your Ubuntu file is download available. Once the Ubuntu is finished downloading you can proceed with installing it to Virtual Box.

- 2. Accessing Appearance settings
  - To access Appearance settings in Ubuntu, let's click on user menu at the top right corner on the top menu bar & select System Settings... A window will pop up with all settings divided into personal, hardware & system options icons. Let's first select the Appearance icon.

- Changing Wallpaper picture to what we have at 17.
  - On the left side of Background part, you can see your current wallpaper.
  - On the right side is part where we can select one of Ubuntu's existing wallpaper.



clicking on any thumbnail our wallpaper will be swapped right away, with a fading effect.

If you want to select wallpaper from your picture folder, click on the drop-down menu above thumbnails & select the picture folder. You will see all the pictures in your pictures folder. In thumbnails you can select them as your wallpaper where your wallpaper that is in your pictures folder as thumbnails.

To add wallpaper that is in your pictures folder to our wallpaper custom folder, you can select them as your wallpaper custom folder where you can select the picture inside of it.

& choose Ubuntu theme.

Ubuntu also has an option to change the entire way your computer looks.

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

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

### 3) Screen Resolution

- Change the size or rotation of the screen
- Things appear on the screen by changing the screen resolution.
- You can change how big (or how detailed) things appear (for example, if you have a rotating display) by changing the rotation.
- You have a rotating display by changing the rotation.
- 1. Click the icon on the very right of the menu bar & select System settings.
- 2. Open Screen display

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3. If you have multiple displays & they are not mirrored, you can have different settings on each display. Select a display in the preview area.
4. Select your desired resolution & rotation
5. Click Apply. The new settings will be applied for 30 seconds before reverting back. That way, if you cannot see anything with the new.

#### 4. Time Settings

- If you are currently in Indian time). How does the displayed time changed?
- After noting the time changed, change the time zone back to your local time zone.
- Just click on the clock on the top bar, & choose time & date settings, once the time & date window opens, choose time & date settings, the time & date manually, otherwise choose your time zone from the map, & choose Automatic.

## Practical 2

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Ques: Installing and removing software

Ans: Install gcc package, Verify that its runs & 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 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:-

Type : cd build/gcc

sudo make uninstall

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

## Practical 3

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Aim: Utilization of grep, man commands

Documentation:

- a) finding info documentation from the command line: bring up info page usage section.

Ans: To find info about any command, 'info' command is used. The syntax of info command is "info (Command name)".

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

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

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

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

Another way of showing info is the 'man' command. The command is same as 'info' but required data.

- b) finding man pages from the command line: Bring up the man page for the 'ls' command, scroll down to the examples section

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Ans: To use the 'man' command simply type 'man ( command ~~see name~~)'.  
Now we are going to find the manual for 'ls' command.  
Simply type: man ls

c) finding man pages by topic: what man pages are available that document file compression.

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

Simply type: man zip  
man tar

d) finding man pages by section from the code line bring up the man page for the printf function which manual page section are library function found?

Ans: The number corresponds to what sections of the manual page is from. 1 is user command while 8 is sysadmin stuff. The man page for man itself explain it is list the std. one.

There are certain terms that have different pages in different section (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

man --all, do not ignore entries starting with . 38  
-A l --almost all - do not ignore list implied by  
d, - directory  
list entries instead of contents, if do not display symbolic  
line.  
-c -- classify - append indicator (one + 1 => @1) to entries.

man zip:

- add - update existing entries & add new files. If the archive does not exist create it. This is the default mode.

- pushd (b) - update existing entries of an archive if need on-the file system does not add new files to the archive

- delete (d) - select entries in an existing archive & delete them

- copy (cu) select entries in an existing archive & copy them in new archive.

~~man tar:~~

- no .ad - display the pos1 x acts (support for tar)
- no .ad - display the pos1 x acts (support for tar)
- add file : add given file to the archive (useful file names)
- add file : add given file to the archive (useful file names)
- start with dash )

start with dash )

- anchored - pattern match file name start
- anchored - pattern match file name start
- b1 - blocking - factor blocks
- blocks x size bytes per record

on 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 substring  
matches too show you need to use "term" to limit it.

- e) Command - line help list the available option for the mkdix  
command - how can you do this?

\$ mkdix -m a = max dictionaryname

Q

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command line operators :

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-1dap-253/param.d/passwd
- /usr/bin/passwd
- etc/param.d/passwd
- /etc/passwd

find the directory passwd file under root & one level down

✓ # find / -max\_depth 2 -name passwd

- /etc/passwd

find the passwd file under root & 2 level down.

✓ # find / -max\_depth 3 -name passwd

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

- etc / passwd

find - the password file & its sub-directories level 2 & 3.

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

- /usr/bin/passwd

- /etc/ptab.d/passwd

d) Create a symbolic link to the file you found in 4th step

```
# ln -s file1 file2
```

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

```
# touch example.txt
```

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

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

~~```
# rm /tmp/example.txt
```~~

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

```
# whereis ls
```

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

```
# whereis ps
```

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ps : /bin/ps /usr/share/man/ps : /bin/ps /usr/share/man/man1  
man1 | ps -qz

#here's bash

bash : /bin/bash /etc/bash.bashrc /usr/share/man/man1  
bash -l -qz

P/No  
V/P

8A

```
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        7892728 3383372  3326024  51% /
tmpfs            512876   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:~$ mount
/sys on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
udev on /proc/sys/proc (rw,nosuid,noexec,relatime)
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,gid=5,mode=620,ptmxnode=000)
/dev/sda1 / (rw,nosuid,nodev,relatime,stripe=1024,ik,mode=755)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,slim=1024,ik,mode=755)
tmpfs on /run/lock type tmpfs (rw,nosuid,noexec,relatime)
tmpfs on /sys/fs/cgroup type tmpfs (rw,nosuid,noexec,relatime,mode=755)
tmpfs on /run/shm type tmpfs (rw,nosuid,noexec,relatime,xattr,release)
cagent on /lib/systemd/systemd-cgroups-agent type cgroup (rw,nosuid,nodev,noexec,relatime,xattr,releas
pstree on /sys/fs/pstree type pstree (rw,nosuid,nodev,noexec,relatime)
pstree on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpuset,nsroot
cgrouper on /sys/fs/cgroup/net_cls.net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,nsroot
cgrouper on /sys/fs/cgroup/net_cls type cgroup (rw,nosuid,nodev,noexec,relatime,net)
cgrouper on /sys/fs/cgroup/plids type cgroup (rw,nosuid,nodev,noexec,relatime,plids,nsroot)
cgrouper on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsro
cgrouper on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpu
cgrouper on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsro
cgrouper on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memroy,nsroot
cgrouper on /sys/fs/cgroup/biklio type cgroup (rw,nosuid,nodev,noexec,relatime,biklio,nsroot=/
cgrouper on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event
cgrouper on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsro
cgrouper on /sys/fs/cgroup/hugepages type hugetlbfs (rw,relatime,fd=32,pgrp=1,timeout=0,minp
hugepages=1,prot=0,direct)
hugepages on /dev/hugepages type hugetlbfs (rw,relatime)
```

```
jeba@jeba-VirtualBox:~$ ls
Desktop  Downloads  Music  Public  Videos
Documents  desktop  .gg  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$ 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$
```

## Practical 5

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### File Operations

1. Explore mounted file systems on your computer  
→ `df -k`

2. What are the different ways of exploring mounted file systems on Linux?  
→ `mount`

3. Copying text from files  
→ `cp command`, `mv command`

4. Archiving & backup the work directory using `tar`, `gzip` & `bzip2` commands.  
→ `gzip filename.txt`  
→ `Bzip2 filename.txt`

5. Use `diff` command to create diff of two files  
→ `diff filename1 filename2`

6. Use `patch` command to patch a file & analyze the patch using `patch` command again

```

jeba@jeba-VirtualBox:/$ tar -cvf data.tar /mn
tar: data.tar: Cannot open: Permission denied
tar: Error is not recoverable: exiting now
jeba@jeba-VirtualBox:/$ sudo tar -cvf data.tar /mn
tar: Removing leading '/' from member names
/mn/
/mn/hd/
jeba@jeba-VirtualBox:/$ ls
bin  data.tar  etc    lib    mn   opt   run   srv  usr
boot dd      home   lost+found  mnt  proc  sbin  sys  var
cdrom dev     initrd.img  media   mnt1 root  snap  [REDACTED]  vmlinuz
jeba@jeba-VirtualBox:/$ cat data.tar
mn/0000755000000000000000000000000013605376557010365 Sustar rootrootmn/hd/0000755000000
0000000000000000000000000000000013605376557010760 Sustar rootrootjeba@jeba-VirtualBox:/$ █

```

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```

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`*[[[1*[[[1
'Jew$S**[[[1 jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
♦[[[1 dd.txt+OeIeeMeee+ee[[[1 eXjeba@jeba-VirtualBox:~/jeb$ █

```



```

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

```

```
jeba@jeba-VirtualBox:~/Jeb$ cat ht.txt
ht
ht
ht
^C
jeba@jeba-VirtualBox:~/Jeb$ cat hlt.txt
hello
hello
hello
hello
^C
jeba@jeba-VirtualBox:~/Jeb$ dtff -u ht.txt hlt.txt >sam.patch
jeba@jeba-VirtualBox:~/Jeb$ patch ,sam.patch
^C
jeba@jeba-VirtualBox:~/Jeb$ patch <sam.patch
patching file ht.txt
jeba@jeba-VirtualBox:~/Jeb$ cat sam.patch
--- ht.txt      2020-01-08 22:14:55.403509034 +0530
+++ hlt.txt     2020-01-08 22:15:16.259898738 +0530
@@ -1,3 +1,3 @@
-ht
-ht
-ht
+hello
+hello
+hello
jeba@jeba-VirtualBox:~/Jeb$
```

100%  
2/2

## Practical 6

### Use Environment

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

- i) Display /etc/shadow file using cat command & understand the important of shadow file. Note its difference from password file  
 → cat /etc/shadow

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

- Username, up-to 8 characters. case-sensitive usually all lowercase.
- Direct match to the username in the /etc/passwd file.
- Password. 13 character. Case-sensitive, usually all lowercase. A direct match to the username log in (usually a bad idea) & a '\*' entry indicate 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 must be changed (9999 indicates user can keep their password unchanged for many, many years).
- The number of days to warn user of an expiring password
- The number of days after password expires that account is disabled.
- A reserved file for possible future use

```
root@jessie:~# cat /etc/shadow
root:$1$OJr0o7fK$0t2z/Bm$Bash
daemon:$1$1$daemon:/usr/sbin/nologin
bin:$1$2$2$bin:/bin/nologin
sys:$1$3$3$sys:/dev/nologin
sync:$1$4$4$sync:/bin/nologin
games:$1$5$5$games:/usr/games/nologin
man:$1$6$6$man:/var/cache/man/nologin
lp:$1$7$7$lp:/var/spool/lpd/nologin
mail:$1$8$8$mail:/var/mail/nologin
news:$1$9$9$news:/var/spool/news/nologin
uucp:$1$10$10$uucp:/var/spool/uucp/nologin
proxy:$1$11$11$proxy:/var/spool/proxy/nologin
www-data:$1$2$2$www-data:/var/www/nologin
backup:$1$3$3$backup:/var/backups/nologin
list:$1$4$4$list:$1$4$4$list/nologin
```

Each file in a passwd entry is separated with ":" colon characters & 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. This uses this field, plus the following group field security. Usually the group id will match the user id.
- Full name of user I'm not sure what the maximum length for this field is but try to keep it reasonable (under 30 characters).
- User's home directory, usually /home/username • 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

c) Get your current working directory  
→ pwd

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

e) Explore Create alias to most commonly used commands.

→ Alias command instructs the shell to replace one string with another string while executing the commands.

alias label = "command"

## Practical 7

Linux Editors : Vi

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

- a) Create, modify, search & navigate a file in editor
- i) Creating a file  
To create a file, on the terminal type vi followed by filename.

- ii) Modifying the file:  
To modify a file on the vi editor, type 'o'

- iii) Search in a file:  
To find a word press / followed by the word to search.

- iv) Navigate:

Movement in four direction

| key | Action             |
|-----|--------------------|
| k   | Moves cursor up    |
| j   | Moves cursor down  |
| h   | Moves cursor left  |
| l   | Moves cursor right |

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

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

SA

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

```
1 Hello
2 This is our Linux example
3 Welcome
4 Welldone
5 This is Vt Editor
6 Thank you
```

set Research

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

```
1 Hello
2 This is our Linux example
3 Welcome
4 Welldone
5 This is Vt Editor
6 Thank you
```

set nu

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### Scanning

Key

Ctrl + f

Ctrl + b

Ctrl + d

Ctrl + u

Ctrl + l

Action

Scrolls forward

Scrolls backward

Scrolls half page

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 /gc.

#### ii) Highlight

Use set hsearch

#### iii) Show - the line number

Use set nu.

60  
2001

## Practical 8

### Linux Security

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

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

- b) Identify operations that requires sudo privileges.

- c) Modify expiration date for new users using password using chage -l

-e Expiration date

-m Minimum number of days before password changes (in)

-M Number of days password is valid (in)

-I : Account inactive

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

- d) Delete newly added user.

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

```
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  
jeba   ALL=(ALL:ALL) ALL
```

```
jeba@jeba-VirtualBox:~  
jeba@jeba-VirtualBox:~$ sudo chage -l user1  
Last password change : Jan 20, 2020  
Password expires     : never  
Password inactive   : never  
Account expires      : never  
Minimum number of days between password change : 0  
Maximum number of days between password change : 99999  
Number of days of warning before password expires: 7
```

```
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 [-1]: 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, 2026  
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
```

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```
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:~$
```

## Network Management

- a) Get IP address of your machine using `ifconfig`

- b) Get hostname of your machine

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

- d) Use a dig command

- e) Troubleshooting network using tracert route command

- f) Use of arp command

- g) Use of host command

- h) Use of netstat command & Nmap command

```
jeba@jeba-VirtualBox:~$ ifconfig
Link encap:Ethernet HWaddr 08:00:27:0e:6b:69
  inet addr: 10.0.2.15 Brdcast:10.0.2.255 Mask:255.255.255.0
    inet6 addr: fe80::c0c1:3ab:ds3:848e/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:1
      RX bytes:1180 (1.1 KB) TX bytes:8518 (8.5 KB)

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:6536 Metric:1
      RX 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 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms
64 bytes from 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=2 ttl=54 time=82.0 ms
64 bytes from 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=3 ttl=54 time=84.8 ms
64 bytes from 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=4 ttl=54 time=87.1 ms
64 bytes from 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=5 ttl=54 time=93.5 ms
64 bytes from 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=6 ttl=54 time=86.9 ms
64 bytes from 1a2b3c2d.in-Fa.1e100.net (172.217.31.196): icmp_seq=7 ttl=54 time=98.0 ms
64 bytes from 1a2b3c2d.in-Fa.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:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
<<>> 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 22:40:05 IST 2020
; MSG SIZE rcvd: 59
```

```
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:~$
```

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

```
jeba@jeba-VirtualBox:~$ host -v
host 9.10.3-P4-Ubuntu
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          9784       /run/systemd/journal/
socket
unix  3      [ ]     DGRAM          9684       /run/systemd/notify
unix  3      [ ]     STREAM     CONNECTED    44042      @/tmp/dbus-CymTeI7AQG
unix  3      [ ]     STREAM     CONNECTED    43331      @/tmp/dbus-CymTeI7AQG
unix  3      [ ]     STREAM     CONNECTED    42988      @/tmp/dbus-CMGGc6G7PS
unix  3      [ ]     STREAM     CONNECTED    42698      @/tmp/dbus-CMGGc6G7PS
stdout
unix  3      [ ]     STREAM     CONNECTED    13242      /run/systemd/journal/
stderr
unix  3      [ ]     STREAM     CONNECTED    43113      /run/systemd/journal/
1x  3      [ ]     STREAM     CONNECTED    43013
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
```

11/01/2020

10  
11

e) chmod 777 filename.sh.  
f) sh filename.sh

Program to display your name.

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

Program to find the sum of two

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

Program to find the sum of two numbers

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 manipulations like insertion, deletion, search etc. With sed, we can edit complete files without actually having to open it

```
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:~$ 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:~$ vi llinux2.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 llinux2.sh
tcsc@tcsc-VirtualBox:~$ ./llinux2.sh
Sum is:125
tcsc@tcsc-VirtualBox:~$
```

1) Displaying partial text of a file.

With sed, we can view only part of a file rather than seeing 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 number followed by 'd'

4) search & Replacing a string  
is 's' option is for searching a word.

5) Replace a string on particular line

To replace a string on particular, use line number with 's' option.

6) Add a line after / before the matched string

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

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

```
subjects offered in cs
datastructure
database management
linux
python
green tech
softskill
stats
calculus
computer basic
```

```
tcsc@tcsc-VirtualBox:~$ vi lin.sh
tcsc@tcsc-VirtualBox:~$ chmod 777 lin.sh
tcsc@tcsc-VirtualBox:~$ ./lin.sh $0 $0
sum ls:120
tcsc@tcsc-VirtualBox:~$
```

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

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

- 22
- 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'  
Ex as follows:
  - 8) Appending Line  
To add some content before every line with sed, use  
Ex as follows:

9/12  
11/2

```

tcsc@tcsc-VirtualBox:~$ sed 's/this is linux' cs.txt
subjects offered in cs
datastructure
green tech
softskill
stats
calculus
computer basic
tcsc@tcsc-VirtualBox:~$ 

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

```