

Practical - 1

Ubuntu is a Free and open source Software based on Debian. Ubuntu is officially released under 3 editions Desktop, Server, Union.

All the editions can be run on the computer alone or a virtual box machine. It is a popular open source software for cloud computing with support of openstack.

Steps for installing Ubuntu in a virtual machine.

Step 1: Select a virtual optical file or a physical drive to start Ubuntu in your virtual machine space given to it. It is 186 GB.

Step 2: Select the language of your choice and click on 'Install Ubuntu'. You can also try Ubuntu for free on computer device from this ch

Step 3: In 'Updates and add software' click on the normal installation.

Step 4: While configuring installation type we need to click 'Erase disk and install Ubuntu'. This step would delete all type of documents, photos etc. in all operating systems.

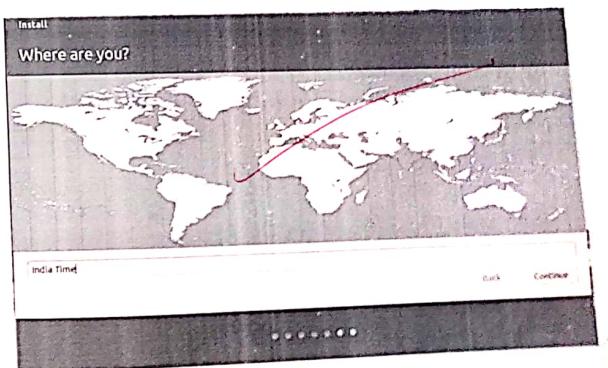
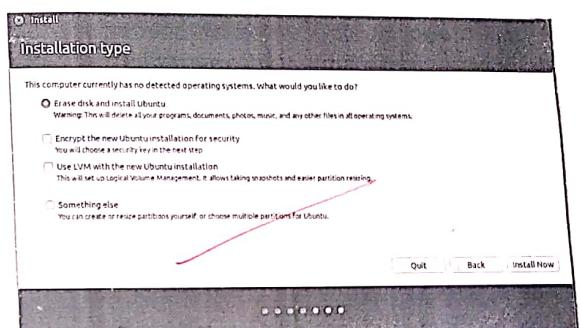
Step 5: In this you only need to choose the location for the clock to work on ubuntu.

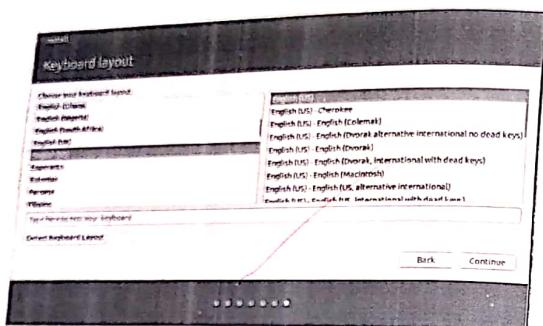
Step 6: In this type you need to choose username and password for the login in ubuntu and then click on continue.

Step 7: Here you simply need to type password again and it is done.

Step 8: Type name of virtual box disk and recommended size to be given is 2048 MB or 2.09 GB.

here for now the virtualbox is ready to use.





Customize desktop environment by changing different default options like changing default background, Themes, screen savers.

Accessing Appearance Settings

- To access Appearance Setting in Ubuntu, let's click on user menu at the top right corner, on the top menu bar and select System Settings...
- A window will pop-up with All setting divided into personal, Hardware and system options icons. Let's first select the Appearance icon.

Changing Wallpapers picture

- On the left side of Background part, you can see your current wallpaper.
- On the right side is part where we select one of Ubuntu wallpapers. Click on any thumbnail our wallpaper will be changed right away, with a fading effect.

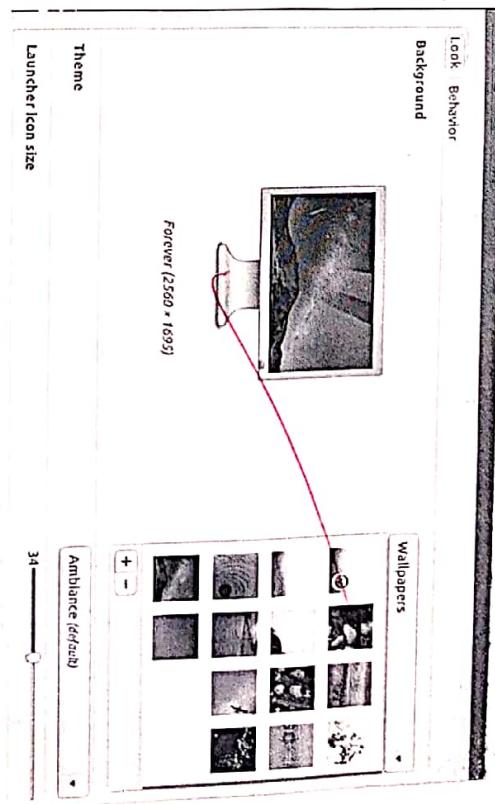
- If you want to select wallpaper from your picture folder, click the drop-down menu above thumbnails and select the picture folder.

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

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

Changing Ubuntu Theme

- Ubuntu also has an option to change the Desktop Theme, which is on click will changes the entire way your computer looks.



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

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

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

Change the size or rotation of the screen.

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

You can change which way up things appear by changing the rotation.

- Click the icon on the very right of the menu bar and select System settings.

2. Open Screen Display.

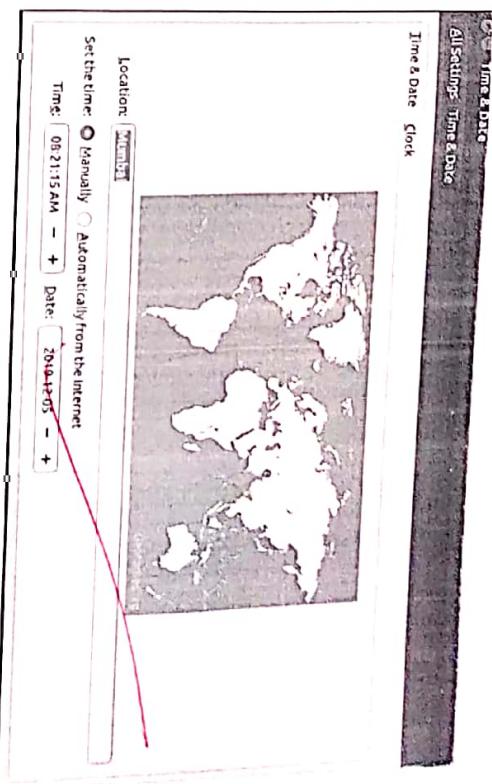
3. If you have multiple display and they are not mirrored you can have different settings on each display - Select a display in the preview area.

4. Select your desired resolution and rotation.

5. click apply . The new setting will be applied for 30 seconds before reverting back . That way , if you cannot see anything with the new

Time Setting change the time zone of your system to Cor New. your time

• If you are currently in Indian time . How does the displayed time change ?



- After nothing the time change, change the time back to your local time zone.
- Just click on the clock on the top bar, and choose time and date settings, once the time and date window opens, choose manually, so you can change the time and date manually; otherwise choose your time zone from the map, and choose Automatic.

By
Sarita

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Aim: Installing and removing Software

ST Step 1: Install gcc package, verify that it runs and remove it.

Step 1: List 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 trying the following command installation will take place.

Step 3: Type sudo apt-get install build essential. This will install all the libraries required for C and C++ programming language.

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 directory.

Log
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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.

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 ($ctrl + Alt + T$) and type: Info grep

After typing this command following output will be displayed on to your screen.

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

Practise

are

Summarized form & shortly

name lists directory contents
syntax: ls [option] ... [files]

synopsis: ls [option] ...
its information in the about files

or all
do not ignore entries starts

-t - recursive
print r-style escapes

info is the 'man' command. The command
is the 'man' command. The command
is same as 'info' but required data.

Section.

Ans: To use the 'man' command simply type:

'man ls'

Name: for A - content C-create . The GNU vision

Synopsis: -l - different .. compared deleted

Description:

For stores and extracts files from o steps

* 'tar zp'

Name: tar
Synopsis:
tar -z (see separate man page)

zip note (see separate man page)

Description: zip is compression and file packaging utility

UNIX, VMS, MS DOS, OS/2

Q] Finding man pages by section from the command line bring up the man page for the printfd function. What manual page section are library functions found?

Ans: The number corresponds to what section of the manual page is from; 1 is user command while 8 is System admin stuff. The man page for man itself explains it and lists the std. outline.

There are certain terms that have different pages in different sections (e.g. printf as a command appears in section 1, as a 'stdlib' function appears in section 3); in 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 substring matches too. So you need to use "Term" to limit it.~~

MANUAL SECTIONS

The standard sections of the manual include:

- 1 User Commands
- 2 System Calls
- 3 C Library Functions
- 4 Devices and Special Files
- 5 File Formats and Conventions
- 6 Miscellanea
- 7 Games et. al.
- 8 System Administration Tools and Demons

Distribution customize the manual section to their specifics, which often include additional sections.

\$ man 1 printf
\$ man 3 printf
\$ man -a printf
\$ man -k '^printf'

~~Printd~~
~~Printf~~
~~Prints [builtins]~~

(1) - format and print data
(3P) - write formatted output
(1) - bash built-in commands, see bash(1)

C] Command-line Help list the available options for the mkdirm command. How can you do this?

\$ mkdirm -m a=rwx directoryname

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command line operations:

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 password file in / using find command.

find / -name password

- * /usr/share/doc/nss-1.25.3/pam.d/password
- * /user/bin/password
- * /etc/pam.d/*password
- * /etc/*password

d) find the password file under root and one level down:

find / -maxdepth 2 -name password

- * /etc/*password

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c) find the passwd file under root / and
level down.

find / -name passwd
• /usr / bin / passwd
• /etc / passwd

d) find the password file below sub-directories
level 2 to 4.

find -maxdepth 3 -name passwd
• /usr / bin / passwd
• /etc / passwd

e) Create a symbolic link to the file you
found in 1st step:

ln -s file1 file2

~~Step 10~~

f)

Create an empty file example yet now
to 1 step directory min relative pathname

touch example.txt
mv example.txt /tmp

ij

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

rm /tmp / example.txt

jj find the location of ls, ps, bash commands

whereis ls

ls: /bin /k /usr / share / man / man 1 / ls.1.g2

whereis ps

ps: /bin /ps /usr / share / maps: /bin /ps /usr / share
/ man / man 1 / ps.1.g2

whereis bash

bash: /bin / bash / etc / bash - bashrc / usr / share /
man / man 1 / bash - 1.g2.

Explore mounted file systems on your computer

Ans: df -h

	Total	Used	Available	Use%	Mounted on
jebas@jeba-VirtualBox:~\$ df -h					
Filesystem	TOTAL	USED	AVAIL	PCT	
/dev/sda1	494436	98740	400000	4%	/run
/dev/sda1	102416	3676	98740	51%	/dev/shm
/dev/sda1	7092728	3383372	3326024	1%	/run/lock
/dev/sda1	512876	216	511660	1%	/sys/fs/cgroup
/dev/sda1	5120	4	51116	0%	/run/user/1000
/dev/sda1	512076	0	512076	0%	
/dev/sda1	10416	48	103368	1%	

What are the different ways of exploring mounted file systems on Linux?

Ans: mount

```
jeba@jeba-VirtualBox:~$ mount
sr0 on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
/dev on /dev type devpts (rw,nosuid,noexec,relatime,SIZE=494436k,NR_INODES=123669,mode=755)
tmpfs on /run type tmpfs (rw,nosuid,noexec,relatime,SIZE=102416k,mode=755)
tmpfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,SIZE=5120k)
tmpfs on /run/shm type tmpfs (rw,nosuid,nodev,noexec,relatime,SIZE=494436k,mode=755)
tmpfs on /sys/fs/cgroup type tmpfs (rw,nosuid,nodev,noexec,relatime,xattr,releases=1,root=1)
tmpfs on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime)
tmpfs on /sys/fs/cgroup/systemd-cgroups-agent type cgroup (rw,nosuid,nodev,noexec,relatime)
tmpfs on /sys/fs/cgroup/suspend type cgroup (rw,nosuid,nodev,noexec,relatime)
tmpfs on /sys/fs/cgroup/cpuset type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpu_set,cpu_isolate,cpu_isolate_nesting,cpu_isolate_nesting_root)
tmpfs on /sys/fs/cgroup/net_cls,net_prio type cgroup (rw,nosuid,nodev,noexec,relatime,net)
tmpfs on /sys/fs/cgroup/net_cls,net_prio,nsroot type cgroup (rw,nosuid,nodev,noexec,relatime,net)
tmpfs on /sys/fs/cgroup/pids type cgroup (rw,nosuid,nodev,noexec,relatime,pids,nsroot=1)
tmpfs on /sys/fs/cgroup/freezer type cgroup (rw,nosuid,nodev,noexec,relatime,freezer,nsroot)
tmpfs on /sys/fs/cgroup/cgroup/cgroup type cgroup (rw,nosuid,nodev,noexec,relatime,cgroup,cpu,cpuacct,cpuacct_type,cpu,cpu_isolate,cpu_isolate_nesting,cpu_isolate_nesting_root)
tmpfs on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsroot)
tmpfs on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot)
tmpfs on /sys/fs/cgroup/bikto type cgroup (rw,nosuid,nodev,noexec,relatime,bikto,nsroot)
tmpfs on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event)
tmpfs on /sys/fs/cgroup/hugetlbfs type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlbfs,nsroot)
tmpfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

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Ans : cp command, mv command

3. Copying text from files.

```
jeba@jeba-VirtualBox:~/jeba$ ls
Desktop  Downloads  desktop  j3  Music  Pictures  Templates  Videos
Documents  examples  desktop  j3abs  cat 99.txt
jeba@jeba-VirtualBox:~/jeba$ cp 99.txt dd.txt
jeba@jeba-VirtualBox:~/jeba$ cat 99.txt
Linux
jeba@jeba-VirtualBox:~/jeba$ cat dd.txt
Linux
jeba@jeba-VirtualBox:~/jeba$ rm 99.txt
jeba@jeba-VirtualBox:~/jeba$ ls
```

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

4. Archiving and backup the work directory using tar, gzip and bzip2

commands.

```
gzip filename.txt  
Bzip2 filename.txt  
tar -cvf
```

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

3. Use diff command to create diff of two files
Ans: **diff filename1 filename2**

Ans: diff filename1 filename2

```
Jebaa@Jebba-VirtualBox:~/JebS ls  
dd-txt.gz ss-txt.bzz  
Jebaa@Jebba-VirtualBox:~/JebS cat >> /dev/null
```

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

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a) Which account you are holding

The command & menu

AIB: AIAA-2002-0832

000 Jepau, VirtualBox:-5 who 2020-01-15 20:34:11
1cba9cfcba-017 virtualbox whoami

780 *Id=ttw*

meba@jeba-VirtualBox:~

b) Display /etc/shadow file using cat command and understand the importance of shadow file. How it's different than passwd file

- Username, up to 8 characters. 'Case-sensitive', usually all lowercase. A direct match to password.
 - The username in the /etc/pwfile file.
 - Password, 13 character encrypted. A blank entry (e.g.: "") indicates a password is not required to log in and a "+" entry (e.g.: "+") indicates the account has been disabled.
 - The number of days since the password was last changed.
 - The number of day before password may be changed.
 - The number of day after which password be changed.

- The number of day to warn user
 - of an expiring password
 - The number of day after password expires that account is disabled
 - The number of day since January 1 1970 that an account has been disabled.
 - A reserved field for possible future use.
- Each field in a password entry is separated with ":" colon characters and are as follows:
- Username up to 8 characters (as seen in the "x" in the password field). Password are stored in the "/etc/shadow" file.
 - Numeric user id. This is assigned by the "adduser" script. Unix uses this field, plus the following field to identify which group it belongs to user.
 - Numeric group id. Red Hat user groups its in a singly unique manner usually the group id will match the user id.

```
Jebaj@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:8:18: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:Matting List Manager:/var/list:/usr/sbin/nologin
```

- c) Get your current working directory
Ans: pwd

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

Explore different ways of getting command history; how to run previously executed command without typing it.

Ans: history

!line number

```
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
Login      tty1   2020-01-15 20:30
jeba@jeba-VirtualBox:~$
```

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Full name user . I'm not sure what the maximum length for this field is but try to keep it reasonable.
User's home directory . usually /home/username . All user's personal files, web page mail forwarding, etc. will be stored here.
User's "shell account" often set to "/bin/bash" to provides access to the bash shell (my personal favorite shell).

- e) Create alias to most commonly used commands.

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

Ans: alias label="command"

```
jeba@jeba-VirtualBox:~$ alias m="mkdir new"
jeba@jeba-VirtualBox:~$ m
jeba@jeba-VirtualBox:~$ ls
Desktop  Downloads  Documents  Examples/Desktop  Pictures  Templates
Music    New       Public    Videos
jeba@jeba-VirtualBox:~$
```

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Word Navigation

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- e) Create, modify, search and navigate a file in editor.
 - f) Creating a file.
 - g) Create a file, on the terminal type vi followed by filename.
 - h) modifying the file:
 - i) modify a file, on the vi editor, type 'o'.
 - j) Search a file
 - k) find a word (forward search)
- Press / followed by the word to search navigate :

Movement in four directions.

key	Action
k	Move cursor up
j	Move cursor down
h	Move cursor left
l	Move cursor right

Scrolling

key	Action
ctrl + d	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/gc

jeba@jeba-VirtualBox ~

```
Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you.
```

```
jeba@jeba-VirtualBox ~
Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you.

:jeba@jeba-VirtualBox ~
Hello
This is my Linux example
Welcome
Welldone
This is VI Editor
Thank you.

:g/this/s/our/gc
```

✓

```
Hello
Welcome
Welldone
This is VI Editor
Thank you

This is our Linux.example
Welldone
This is VI Editor
Thank you
```

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ii)

Show the line number

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

:set hlsearch
```

Use set nu

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

:set nu
```

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
Password Inactive [1]:	5
Account Expiration Date (YYYY-MM-DD) [-1]:	2020-01-21
Last Password Change [-1]:	2020-01-31
Password expires	: Jan 21, 2020
Account expires	: Aug 08, 2020
Minimum number of days between password change	: never
Maximum number of days between password change	: 100
Number of days of warning before password expires	: 200
	: 5

a) Use of sudo to change user privileges to root.
Create an user named user1
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 line as highlighted below.

```
# 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
#    nat,badpass
#    secure_path="/usr/local/bin:/usr/bin:/usr/sbin:/bin:/sbin/bin"
#    defaults
# Host alias specification
# User alias specification
# Cmnd alias specification
# User privilege specification
Root    ALL=(ALL:ALL) ALL
#
```

b) Identify operations that require sudo privileges

```
jeba@jeba-VirtualBox:~$ su user1
Password:
jeba@jeba-VirtualBox:~$ mkdir 'folder1'
mkdr: 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 password ageing.

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

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

-E: Expiration Date
-m: Minimum number of days before password change
-M: Number of days password is valid
-I: Account inactive
-W: Number of days of warning before a password change is required

d) Delete newly added user

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

- a) Get IP address of our machine using ifconfig

```
jeba@jeba-VirtualBox:~$ ifconfig
jeba@jeba-VirtualBox:~$ ifconfig
eth0      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::c0c:5ab3%eth0 brd fe80::ff:fe00:15b0
          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: ::/128 Scope:Host
          UP LOOPBACK RUNNING MTU:65536 Metric:1
          RX packets:52240 errors:0 dropped:0 overruns:0 carrier:0
          TX packets:52240 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1
          RX bytes:4225972 (4.2 MB) TX bytes:4225972 (4.2 MB)
```

- b) Get hostname of our machine

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

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

```
jeba@jeba-VirtualBox:~$ ping www.google.com
PING www.google.com (172.217.31.196) 56(84) bytes of data.
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=1 ttl=54 time=97.8 ms
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=2 ttl=54 time=82.9 ms
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=3 ttl=54 time=84.8 ms
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=4 ttl=54 time=87.1 ms
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=5 ttl=54 time=93.5 ms
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=6 ttl=54 time=86.9 ms
64 bytes from naas03s28-in-f4.1e10b.net (172.217.31.196): icmp_seq=7 ttl=54 time=90.9 ms
[1]+ Stopped                  ping www.google.com
```

- d) Use of dig command

```
jeba@jeba-VirtualBox:~$ dig www.google.com
;-->> DiG 9.10.3-P4 Ubuntu <--> www.google.com
; Global options: +tcp
; Got answer:
;-->>HEADER<-- opcode: QUERY, status: NOERROR, id: 52068
; OPT_PSEUDOSECTION: EDNS: version: 0, flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
; QUESTION SECTION: www.google.com.
;ANSWER SECTION:
www.google.com. 91 IN A 172.217.166.100
; SERVER: 127.0.1.1#53(127.0.1.1)
; WHEN: Mon Jan 26 22:40:06 IST 2020
; MSG SIZE rcvd: 59
jeba@jeba-VirtualBox:~$
```

- e) Troubleshooting network using traceroute, route command

```
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  58.496 ms  68.495 ms
jeba@jeba-VirtualBox:~$
```

- f) Use of arp command

```
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    0      0    0 enp0s3
10.0.2.0        *               255.255.255.0 U     0      0    0 enp0s3
link-local      *               255.255.0.0   U     0      0    0 enp0s3
jeba@jeba-VirtualBox:~$
```

- g) Use of host command

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

- h) Use of netstat command and Nmap command

jeba@jeba-VirtualBox:~\$ netstat		Foreign Address	State
Active Internet connections (w/o servers)			
proto Recv-Q Send-Q Local Address State			
Active Unix domain sockets (w/o servers)			
Proto Refcnt Flags Type			
unix 2 dNotify []	42149	/run/user/1000/system	I-Node
unix 2 []	9694	/run/systemd/Journal/	Path
unix 2 []	9695	/run/systemd/Journal/	Path
syslog []	9704	/run/systemd/journal/	Path
unix 16 []	9704	/run/systemd/notify/	Path
dev-log []	9704	@/tmp/dbus-CymTeIT7AQ	Path
unix 7 socket []	9704	@/tmp/dbus-CHGG6GPR	Path
unix 3 []	43331	/run/systemd/Journal/	Path
unix 3 []	42988	/run/systemd/Journal/	Path
unix 3 []	42698	/run/systemd/Journal/	Path
unix 3 []	13242	/run/systemd/Journal/	Path
unix 3 []	43113	/run/systemd/Journal/	Path
stdout []	43113	/run/systemd/Journal/	Path
unix 3 []	43013	/run/systemd/Journal/	Path
stderr []	42935	/run/systemd/Journal/	Path
unix 3 []			

```
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
          DNS record for 216.58.196.68: b0m65s11-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:~$
```

Echo \$SHELL

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

PRACTICAL = 10

AJMR 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 return whatever you type in. ~~It is called echoing~~
- ~~It is written at the top of shell script and it passes the instruction to the program /bin/bash~~

- Chmod 777 filename.sh

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

- Chmod 777 filename.sh

```
vi filename.sh  
#!/bin/bash
```

```
echo "THIS IS LINUX"
```

```
tsc@tsc-VirtualBox:~$ ./filename.sh  
THIS IS LINUX!
```

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Step 4: write and execute a shell script

Shell script is just a simple text file with .sh extension, having executable permission.

- a) open terminal
 - b) navigate to the place where you want to create script using cd command.
 - c) touch filename.sh [you can use your favorite editor to edit the script]
 - d) chmod +x filename.sh (for making the script executable)

Program to display your name

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

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

Program to find the sum of two numbers

variable.

```
#!/bin/bash
a=10
b=25
sum=$(( $a + $b ))
echo "Sum is $sum"
```

```
vi filename.sh
#!/bin/bash
```

```
a=100
b=25
```

```
sum=$(( $a + $b ))
echo "Sum is $sum"
```

Program to find the sum of two numbers
(Value passed during execution)

```
vi filename.sh
#!/bin/bash
#11 /bin / bash
a=$1
b=$2
sum=$(( $a + $b ))
echo "Sum is $sum"
```

Program to find the sum of two numbers (values passed during execution)

```
vi filename.sh
#!/bin/bash
#11 /bin / bash
a=$1
b=$2
sum=$(( $a + $b ))
echo "Sum is $sum"
```

Sed

Sed command or stream editor is very useful utility offered by Linux system. It is mainly used for text substitution. It is used to replace just like can perform find & replace, sort manipulations, sort, test manipulation, search, etc. with Sed, deletion, insertion, the following test file.

- ⑤ Displaying part of a file.
With sed, we can view only part of a file or the part whole file.
- ⑥ Display all except some lines
To display all content of a file except for some portion use option 'd'.

```
tcscl@tcscl-VirtualBox:~$ vi lin.sh
tcscl@tcscl-VirtualBox:~$ chmod 777 lin.sh
sum ts:120
tcscl@tcscl-VirtualBox:~$
```

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tcscl@tcscl-VirtualBox:~\$
subjects offered in cs
datastructure
python
green tech
softskill
stats
cactus
computer basic

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

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

3) Deleting a line
To delete a line, use line number followed by 'd'

```
tcsc@tcsc-VirtualBox: ~
```

```
sed -i '5 d' cs.txt
```

```
tcsc@tcsc-VirtualBox: ~
```

```
cat cs.txt
```

```
Linux
```

```
Computer basic
```

```
tcsc@tcsc-VirtualBox: ~
```

```
sed -i '5 d' cs.txt
```

```
tcsc@tcsc-VirtualBox: ~
```

```
cat cs.txt
```

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

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3) Deleting a line

To delete a line, use line number followed by 'd'

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

5) Replace a string on a particular line.

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

```
tcsc@tcsc-VirtualBox: ~
```

```
sed '6 s/cs/computer system /' cs.txt
```

```
tcsc@tcsc-VirtualBox: ~
```

```
cat cs.txt
```

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

c) Add a line after / before the matched string.

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

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

d) To change a whole line with matched pattern.

To change whole line to a new line, when a search pattern matches, use option "c".

8) Appending line

To add some content before every line with sed, use # and & as follows,

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

```
tcs@tcs-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
tcs@tcs-VirtualBox:~$
```

```
tcs@tcs-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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