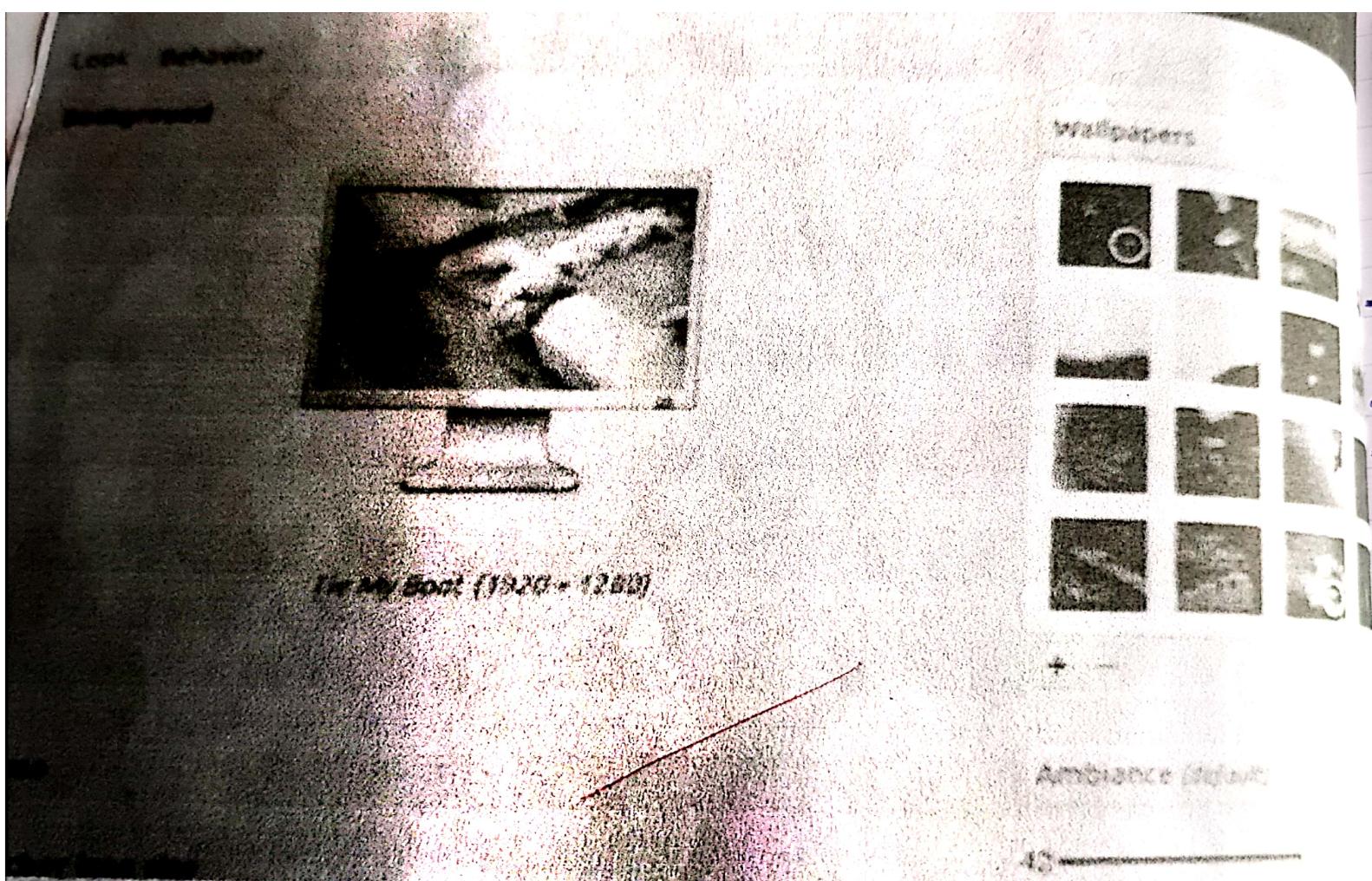


- Aim:-
- 1) Install your choice of linux distribution  
eg:- Ubuntu, Fedora.
  - 2) Customize desktop environment by changing diff default options like screen savers, themes, changing default background,
  - 3) Screen resolution
  - 4) Time settings.

## STEP 7 TO INSTALL OPERATING SYSTEM IN VIRTUAL BOX

- The first step is to come choose the installing language.
- Choose a language.
- A screen appears showing how prepared you are for installing Ubuntu. If you are using a laptop make sure your computer is either plugged in or has enough battery life. We recommended you connect.  
There are 2 check at the bottom of the screen - choose whether to install updates as you go. Then choose whether to install 3<sup>rd</sup> party software if you have a fast enough internet connection. Click continue.

The installation type asks you how you wish to partition the hard drive.  
When installing on a real hard drive this step cause people anguish. It will not affect windows in any ways whatever.



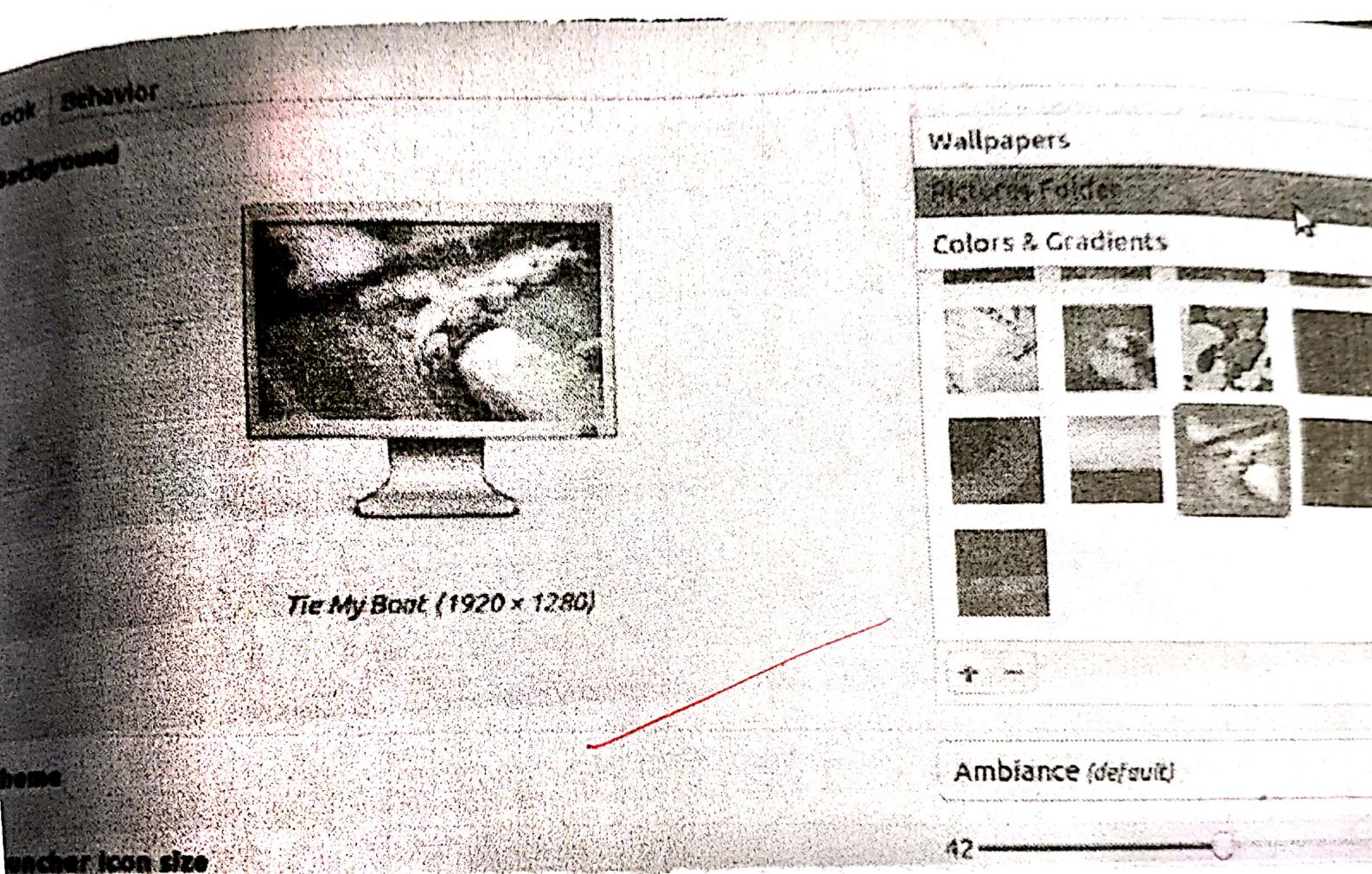
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- Select erase disk card to install Ubuntu.
- Click install now.
- The installation begins and the files are copied to the virtual hard drive.
- Click the map to choose your location.
- Choose the language for your keyboard.

\* Customize desktop environment by changing default options like changing default background themes, screensavers etc.

Accessing appearance settings.

- To access appearance settings in Ubuntu, click on user menu at the top right corner. On the top menu bar and select system settings.
- A window will pop-up with all settings divided into personal, hardware and system categories.



## Changing Ubuntu theme

Ubuntu also has an option to change the desktop theme, which in one click will change the entire way your computer looks.

To do that, Click on the drop-down menu below the wallpaper thumbnails, and choose between ambience, radiance or high contrast. Ambience is a light theme that looks a bit more Mac-like, while radiance is the darker brown theme used in Ubuntu by default.

## 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.

~~Open screen display.~~ Select your desired resolution and rotation. Click apply. The new settings will be applied for 30 seconds before reverting back. That way, you cannot see anything with the new.



1:45 AM



Abed



Wednesday, 25 September 2013

◀ September ▶

◀ 2013 ▶

Sun Mon Tue Wed Thu Fri Sat

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5
6	7	8	9	10	11	12

Time &amp; Date Settings...

Q8

Aim: Installing and removing software

- a) Install gcc package, verify that it runs and then remove it.

Step 1:  
First type 'gcc -v' to know if you have already installed gcc compiler or not. If the output is blank then it means that you don't have gcc installed.

Step 2:  
Type 'sudo apt-get install gcc'. After the following command installation will take place.

Step 3:  
Type 'sudo apt-get install build-essential', this will install all the libraries required by C and C++ programming language.

How to Uninstall gcc compiler:-

In GCC 5.1.0, although there is no top level uninstall target, some directories do have particular .gdb so you can do:

?r = cd build/gcc  
sudo make uninstall

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

~~80  
25/01~~

### Practical - 3

Ques: Utilization of grep, man commands.

Documentation:

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 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+f) and type: info

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

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

Another more summarized form of showing info is the 'man' command. The command is same as 'info', but required extra

Finding man pages from the cmd line: Bring up the man page for 'ls' command scroll down to the examples section.

`-j` -- all, do not ignore entries starting with <sup>42</sup>  
`-A`, -- almost all - do not list implied and  
`-d`, -- directory.  
`-l` (list entries instead of contents), and do  
not differ symbolic link.  
`-f` -- classify - append indicator (0n or & 1=eq)  
to entries

`man zip;`

`-a` - update existing entries and add new files  
If the archive does not exist create it.

`-fresher (6)`. update existing entries of an  
archive if need on the file system does not  
add new files to the archive.

`-d`elete (d) - delete the files

`-c`opy (n) copies the file

an Tar!

~~`-o`fact - disable the post xaxis support  
`d` file: add new file to the archive  
`n`chored - pattern match file name starts~~

`-- blocking - factor` blocks  
`blocks * size bytes per second.`

- To use the 'man' command simply type 'man (command name)'. Now we are going to find the manual for 'tar' command. Simply type: 'man ls'.
- Q:** Finding man pages by topic: What man pages are available that document file compression? 'tar', 'zip' are some man pages which are available for document file compression. Simply type: man zip  
man tar -?
- Q:** Finding man pages by section from the command, bring up the man page for the print fulb function. Which manual page section are library function found.
- Q:** The number corresponds to what section of the manual page is shown. It's user command, while and it's syadnring stuff. The man page doesn't explain it ad list the stdas.

There are certain terms that have different pages in different sections (eg: print f as a command appears in section 1, as 'stdlib' function appears in section 3); in cases like that you can pass the section no. to the man before the page num 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 is with `man -t` (equivalent to a ~~full~~  
~~proper~~ command). It will do a ~~substituting~~ matching so you need to use "term" to limit it.

(c) Command-line Help list the available options for the `mkdir` command. How can you do this?

\$ ~~mkdir -m=777~~ directory\_name,

## Practical - 4. 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/libc-bin_2.25-0ubuntu1_amd64/password`  
`./usr/bin/password`  
`./etc/password`

D) find the directory password file under root and one level down

`# find / -maxdepth 2 -name password`  
~~`./etc/password`~~

find the password file b/w sub-directories  
level 2 and 4.

# find - maxdepth 3 - maxdepth 5 - name  
• /usr/bin/passwd.  
• /etc/passwd /passwd.

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

# ln -s file1 file2.

e) Create an empty file example.txt and it to /tmp directory using relative pathname:

# touch example.txt

# mv example.txt /tmp.

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

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

Find the location of ls, ps bash commands.

? where is ls

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

where is ps.

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

# where is bash.

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

PPAD

## File operations

### Practical - 5

1.) Explore mounted file systems on your computer.

Ans

df -h

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

Ans mount

3) Copying text from files.

↳ cp command, mv command

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

gzip filename.txt

Bzip2 filename.txt

Use diff command to create diff of 2 files  
diff filename1 filename2

Use patch command to patch a file. And analyze the patch using patch command along with

```
jeba@jeba:~$ ls /sys
tmpfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime)
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)
dev on /dev type devtmpfs (rw,nosuid,relatime,atime,slab=1048576,pgsize=4096,nr_inodes=16384,root_size=512,root_id=737,dirty_ratio=20,dirty_time=100,relatime)
vpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,atime,slab=1024,pgsize=4096,nr_inodes=1024,root_size=4,dirty_ratio=20,dirty_time=100,relatime)
pfs on /run type tmpfs (rw,nosuid,noexec,relatime,atime,slab=512,pgsize=4096,dirty_ratio=20,dirty_time=100,relatime)
ev/sdai on / type ext4 (rw,relatime,errors=remount-ro,data=ordered)
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)
pfs on /dev/shm type tmpfs (rw,nosuid,nodev)
pfs on /run/lock type tmpfs (rw,nosuid,nodev,noexec,relatime,atime,slab=512,pgsize=4096)
pfs on /sys/fs/cgroup type tmpfs (rw,nosuid,nodev,noexec,relatime,atime,slab=512,pgsize=4096)
cgroup on /sys/fs/cgroup/systemd type cgroup (rw,nosuid,nodev,noexec,relatime,atime,nsroot=/)
agent=/lib/systemd/systemd-cgroups-agent,hierarchy=sysvand,nsroot=/
store on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime)
cgroup on /sys/fs/cgroup/cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,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,nsroot=)
cgroup on /sys/fs/cgroup/cpu,cpuacct type cgroup (rw,nosuid,nodev,noexec,relatime,cpu,cpuacct,nsroot=)
cgroup on /sys/fs/cgroup/devices type cgroup (rw,nosuid,nodev,noexec,relatime,devices,nsroot=)
cgroup on /sys/fs/cgroup/memory type cgroup (rw,nosuid,nodev,noexec,relatime,memory,nsroot=)
cgroup on /sys/fs/cgroup/birk type cgroup (rw,nosuid,nodev,noexec,relatime,birk,nsroot=)
cgroup on /sys/fs/cgroup/perf_event type cgroup (rw,nosuid,nodev,noexec,relatime,perf_event,nsroot=)
cgroup on /sys/fs/cgroup/hugetlb type cgroup (rw,nosuid,nodev,noexec,relatime,hugetlb,nsroot=)
temp-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=32,pgsize=1,timeout=50,rlimit_rss=512,maxproc=5,direct)
etlbfs on /dev/hugepages type hugetlbfs (rw,relatime)
```

```
jeba@jeba-VirtualBox:~$ ls
Desktop   Downloads   Music       Public       Videos
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:~$ 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   dev   etc   lib64  mnt  opt  run  srv  usr
boot  dev   home  initrd.img  media  mnt  root  snap  vmlinuz
cdrom dev   initrd.img  media  mnt  root  snap  vmlinuz
jeba@jeba-VirtualBox:~$ cat data.tar
mnn/0000755000000000000000000000000013605376557010365 5ustar rootrootmnn/hd/0000755000000000000000000000000013605376557010780 5ustar rootrootjeba@jeba-VirtualBox:~$
```

```
jeba@jeba-VirtualBox:~/jeb$ bztp2 ss.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt  ss.txt.bz2
jeba@jeba-VirtualBox:~/jeb$ cat ss.txt.bz2
BZh91AY&SY`*E*E
jeba@jeba-VirtualBox:~/jeb$ gzip dd.txt
jeba@jeba-VirtualBox:~/jeb$ ls
dd.txt.gz  ss.txt
jeba@jeba-VirtualBox:~/jeb$ cat dd.txt.gz
jeba@jeba-VirtualBox:~/jeb$
```

```
jeba@jeba-VirtualBox:~/jeb$ ls
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
do
hello world
eba@jeba-VirtualBox:~/jeb$ cat >bb.txt
his is Linux
^C
eba@jeba-VirtualBox:~/jeb$ diff aa.txt bb.txt
c1
hello world
^C
this is Linux
eba@jeba-VirtualBox:~/jeb$ gzip aa.txt
eba@jeba-VirtualBox:~/jeb$ gzip bb.txt
eba@jeba-VirtualBox:~/jeb$ diff aa.txt.gz bb.txt.gz
binary files aa.txt.gz and bb.txt.gz differ
```

- a) Which account you are logged in? How do you find out?
- Ans Who command and whoami.

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

Ans cat /etc/shadow

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

- Username, up to 8 characters. Case-sensitive, usually a lowercase. A direct match to the username in the /etc/password file.
- Password, 13 character encrypted. A blank entry (eg::) indicates a password is not required to log in (usually a bad idea), and a "+" entry indicates the account has been disabled.
- The number of days since the password was changed.

The number of days after which password may be changed.

The no. of days to warn user of an expiring password.

The no. days after password expires the account is disabled. No. of days since january 1, 1970 of an account

```
ubaba-VirtualBox:~$ w  
13:51:04 up 4 min, 1 user, load average: 0.70, 0.79, 0.38  
R   TTY      FROM          LOGIN@    IDLE    JCPU    PCPU WHAT  
a   tty7     :0           20:32      4:28    8.19s  0.33s /sbin/upstart  
ubaba-VirtualBox:~$ w -s  
13:51:14 up 4 min, 1 user, load average: 0.60, 0.77, 0.37  
R   TTY      FROM          IDLE WHAT  
a   tty7     :0           4:38    /sbin/upstart --user  
ubaba-VirtualBox:~$ w -h  
  tty7     :0           20:32      4:44    8.67s  0.33s /sbin/upstart -  
ubaba-VirtualBox:~$ w -f  
13:56:12 up 5 min, 1 user, load average: 0.41, 0.69, 0.37  
R   TTY      LOGIN@    IDLE    JCPU    PCPU WHAT  
a   tty7     20:32      5:36    9.00s  0.33s /sbin/upstart --user
```

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 (case-sensitive; usually  
 all lower case).  
 An "x" in the password field. Passwords are stored  
 in the "etc/shadow" file.  
 Numeric user id. This is assigned by the "adduser"  
 script. Unix uses this field, plus the following  
 group field, to identify which files belong the user.  
 Numeric group id. Redhat uses group id's in a  
 fairly unique manner for enhanced file security.  
 Usually the group id will match the user id.

Full name of user. Two character 30.

User's personal files.

User's home directory.

Shell around. "bin/bash".

Set your current working directory.  
 pwd.

~~Explore different ways of getting command history.  
 How to run previously executed command without  
 typing it.  
 history.  
 The number.~~

```
jeba@jeba-VirtualBox:~$ sudo cat /etc/shadow
[juba] 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:::
```

Create alias to most commonly used commands  
Alias command instructs the shell to replace  
one starting with another string while  
executing the command  
alias label = "command"

```
reba@ieba-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
```

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20/01

## Practical - 7.

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

Modifying the file:

To modify a file, On the vi editor, type 'o'.

To find a word / followed by the word to search, navigate.

Movement in 4 directions:

Key	Action
k	Moves cursor up
j	Moves cursor down
h	Moves cursor left

```
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  
jeba@jeba-VirtualBox: ~$ █
```

780 id=tty1

## Scrolling.

key	Action
ctrl + f	scrolls forward,
ctrl + b	scrolls backward.
ctrl + d	scrolls half page -
ctrl + u	scrolls half page back

learn all essential commands like search, highlight, show the numbers!

replace

highlight

se set hsearch

:ow the line numbers

e set nu.

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

example with our (y/n/a/q/t/^E/^Y) ?

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

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

Practical - 0

## Linux security

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

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

Identify operations that require sudo privileges

Modify expiration date for new user using  
password aging.

```
# Please consider adding 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:~$ 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.
```

Expiration Date:

Minimum number of days before password change  
Number of days of warning before a password  
change is required.

d) Delete newly added user.

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```
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:~$
```

```
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:~$
```

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## Practical 9

### Network management

Get IP address of your machine using ifconfig.

Get hostname of your machine

Use ping to check the network connectivity to  
remote machines

jeba@jeba-VirtualBox: ~

```
virtualBox:~$ ifconfig
    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)

    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: ~

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

Use of dig command.

Troubleshooting network using traceroute, route command.

Use of arp command.

Use of host command

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11/02

of netstat command and Nmap command.

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: 52668  
; 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.  
; ANSWER SECTION: 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:~\$

jeba@jeba-VirtualBox:~  
ba-VirtualBox:~\$ traceroute www.google.com  
ute to www.google.com (172.217.166.100), 30 hops max, 60 byte packets  
0.2.2 (10.0.2.2) 0.190 ms 0.143 ms 0.151 ms  
\*  
0.2.2 (10.0.2.2) 68.568 ms 68.486 ms 68.405 ms  
a-VirtualBox:~\$

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## Practical: 10.

Aim: Shell Scripting.

Basics of shell scripting.

- a) To get a shell, you need to start a terminal.
- b) To see what shell you have, run: echo \$SHELL
- c) In Linux, the dollar sign (\$) stands for shell variable.

The echo command just returns whatever you type in.

#!/bin/bash - It is called Shebang. It is written at the top of a shell script and it passes the instruction to the program /bin/bash.

Echo \$SHELL

i filencme.sh

#!/bin/bash

ho "THIS IS LINUX!"

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

chmod 777 filename.sh  
filename.sh

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

in terminal.

Navigate to the place where you want to create  
script using cd command  
such filename.sh.

filename.sh

chmod 777 filename.sh.

filename.sh or /filename.sh.

```
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
2
1]+ Stopped ping www.google.com
jeba@jeba-VirtualBox: ~ $
```

Program to display your name.

#!/bin/bash

Echo "Enter your name".

Read name.

Echo "My name is : \$name".

Program to find the sum of 2 variables.

vi filename.sh

#!/bin/bash

a= 100

b= 25

$$\text{sum} = \$ (\$a + \$b)$$

Echo "Sum is: \$sum".

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

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

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

```
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
; AUTHORITY SECTION:
; ADDITIONAL SECTION:
; EDNS: version: 0, flags:; udp: 4096
; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; QUESTION SECTION:
; ANSWER SECTION:
; AUTHORITY SECTION:
; ADDITIONAL SECTION:
```

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

```
jeba@jeba-VirtualBox: ~ $ ifconfig  
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:53a0:1d5a3:848e/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)
```

program to find the sum of 2 numbers

## Sed.

Sed. command or Stream Editor is very powerful utility offered by Linux systems. It is mainly used for text substitution, find and replace but can perform other text manipulations like insertion, deletion, search, etc. ~~but~~ With sed, we can edit complete files without actually having to open it.

Consider the following text file



display all except some lines

to display all content of a file except  
some portion, use option 'd'

deleting a line

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

search and Replacing a string

option 's' for searching a word

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5) Replace a string or a particular line  
To replace a string or a particular line,  
use the number with ('s) option.

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 ';'?

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

Change a whole line with a pattern matches, use a matched option like `tr -c` to change a whole line to a new pattern.

adding lines:

\* add some content before every file with sed, and & as follows.

sed  
11/0~

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

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