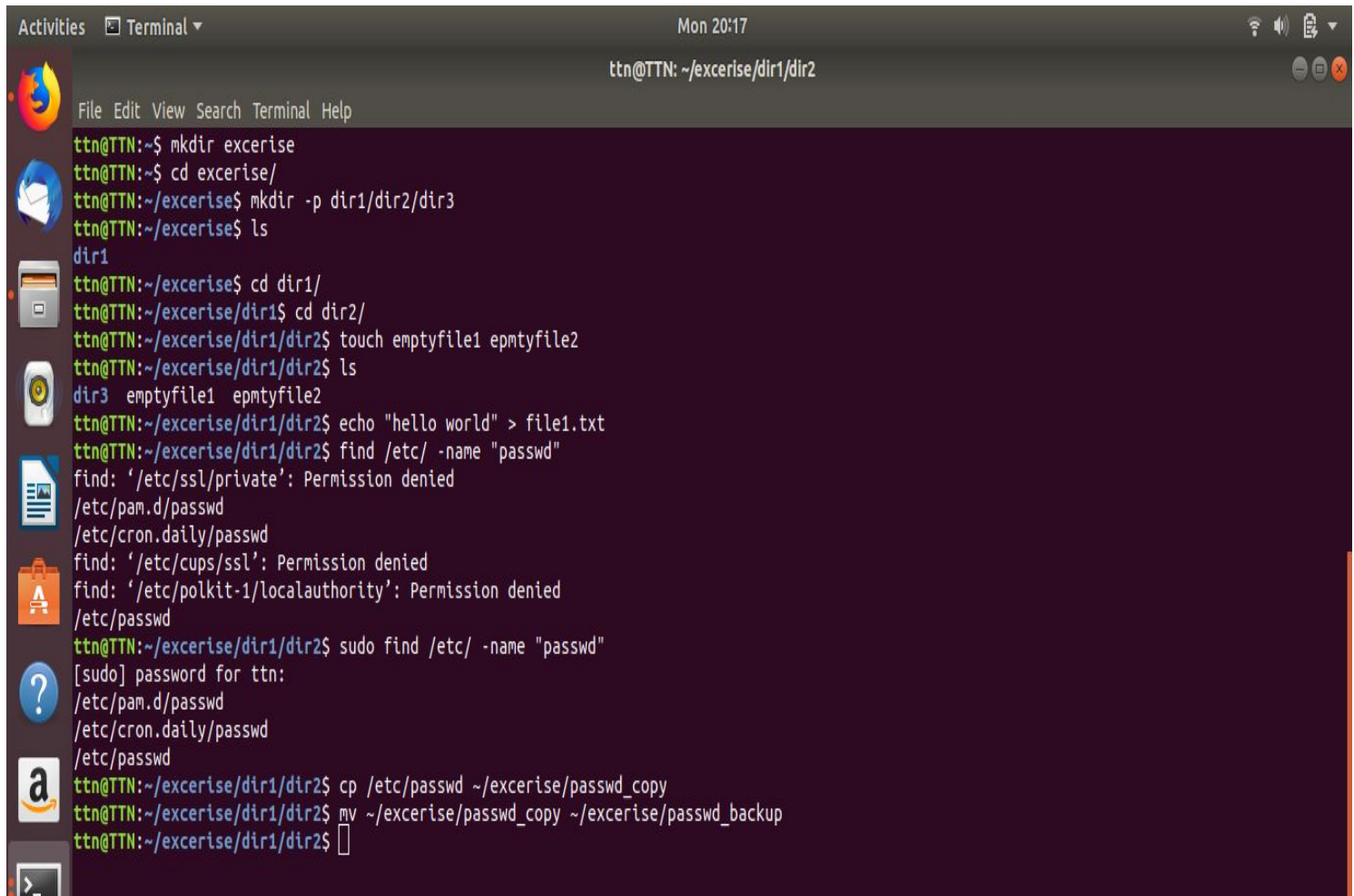


Assessment -1

1. Create a directory "exercise" inside your home directory and create nested(dir1/dir2/dir3) directory structure inside "exercise" with single command.
2. Create two empty files inside dir2 directory: emptyFile1,emptyFile2 in single command
3. Create one file file1.txt containing text "hello world" and save it.
4. Find a "passwd" file using find command inside /etc. copy this files as passwd_copy and then rename this file as passwd_backup.



```
Activities  Terminal  Mon 20:17
ttn@TTN: ~/exercise/dir1/dir2

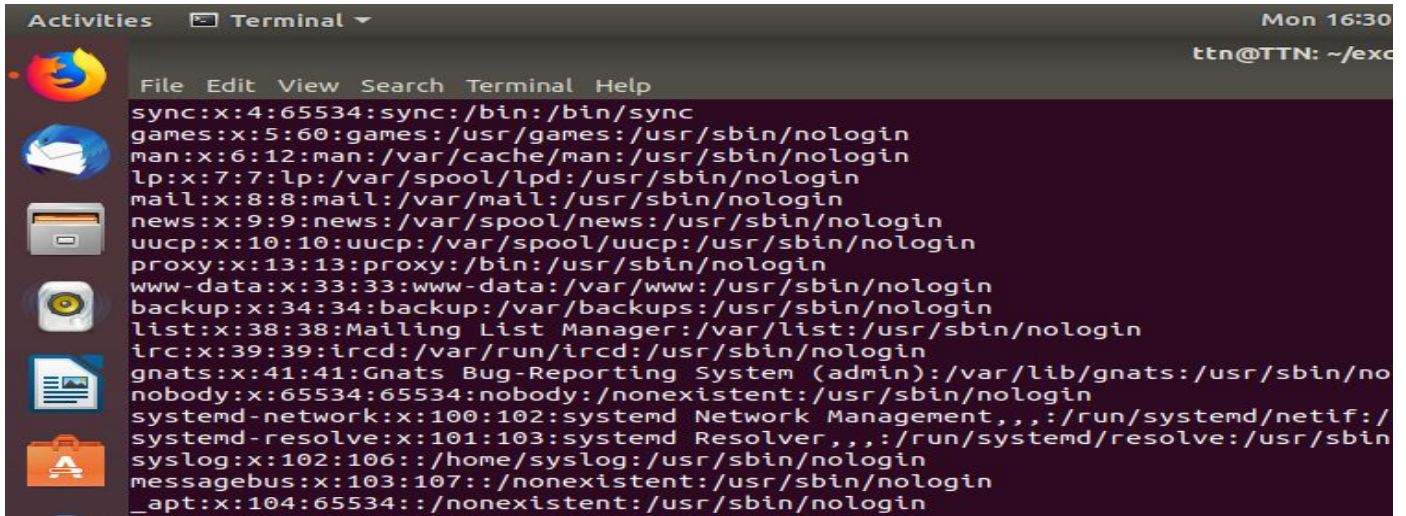
ttn@TTN:~$ mkdir exercise
ttn@TTN:~$ cd exercise/
ttn@TTN:~/exercise$ mkdir -p dir1/dir2/dir3
ttn@TTN:~/exercise$ ls
dir1
ttn@TTN:~/exercise$ cd dir1/
ttn@TTN:~/exercise/dir1$ cd dir2/
ttn@TTN:~/exercise/dir1/dir2$ touch emptyfile1 emptyfile2
ttn@TTN:~/exercise/dir1/dir2$ ls
dir3 emptyfile1 emptyfile2
ttn@TTN:~/exercise/dir1/dir2$ echo "hello world" > file1.txt
ttn@TTN:~/exercise/dir1/dir2$ find /etc/ -name "passwd"
find: '/etc/ssl/private': Permission denied
/etc/pam.d/passwd
/etc/cron.daily/passwd
find: '/etc/cups/ssl': Permission denied
find: '/etc/polkit-1/localauthority': Permission denied
/etc/passwd
ttn@TTN:~/exercise/dir1/dir2$ sudo find /etc/ -name "passwd"
[sudo] password for ttn:
/etc/pam.d/passwd
/etc/cron.daily/passwd
/etc/passwd
ttn@TTN:~/exercise/dir1/dir2$ cp /etc/passwd ~/exercise/passwd_copy
ttn@TTN:~/exercise/dir1/dir2$ mv ~/exercise/passwd_copy ~/exercise/passwd_backup
ttn@TTN:~/exercise/dir1/dir2$
```

5. Try reading passwd_backup file in multiple tools: less,more,cat,strings etc and find the difference in their usage.

```
Activities Terminal
File Edit View Search Terminal Help
ttn@TTN:~/excerise$ strings passwd_backup
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
```

```
Activities Terminal
File Edit View Search Terminal Help
ttn@TTN:~/excerise$ cat passwd_backup
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
```

```
Activities Terminal
File Edit View Search Terminal Help
ttn@TTN:~/excerise/dir1/dir2$ cd
ttn@TTN:~$ cd excercise/
ttn@TTN:~/excerise$ less passwd_backup
ttn@TTN:~/excerise$ more passwd_backup
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
```


A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 16:30, ttn@TTN: ~/exc). The terminal displays a list of system users and their home directories, including sync, games, man, lp, mail, news, uucp, proxy, www-data, backup, list, irc, gnats, nobody, systemd-network, systemd-resolve, syslog, messagebus, and _apt.

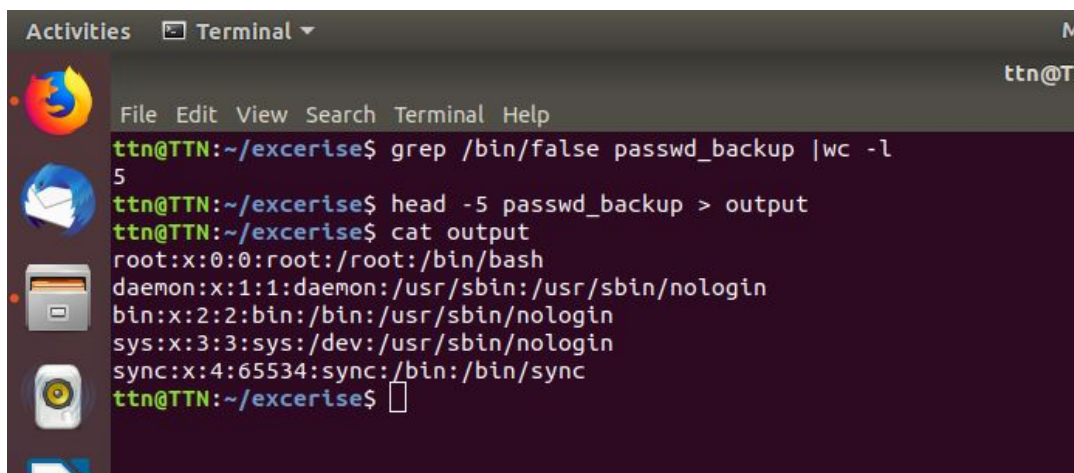
```
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
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
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/no
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin
syslog:x:102:106::/home/syslog:/usr/sbin/nologin
messagebus:x:103:107::/nonexistent:/usr/sbin/nologin
_apt:x:104:65534::/nonexistent:/usr/sbin/nologin
```

The difference btw cat,less,more,strings :

- Cat - cat copies each file ('-' means standard input), or standard input if none are given, to standard output
- Less and more -Less is a program similar to more , but it has many more features.Less does not have to read the entire input file before starting, so with large input files it starts up faster than text editors like vi . Less uses termcap (or terminfo on some systems), so it can run on a variety of terminals. There is even limited support for hardcopy terminals. (On a hardcopy terminal, lines which should be printed at the top of the screen are prefixed with a caret.)
- Strings - Depending upon how the strings program was configured it will default to either displaying all the printable sequences that it can find in each file, or only those sequences that are in loadable, initialized data sections. If the file type in unrecognizable, or if strings is reading from stdin then it will always display all of the printable sequences that it can find.

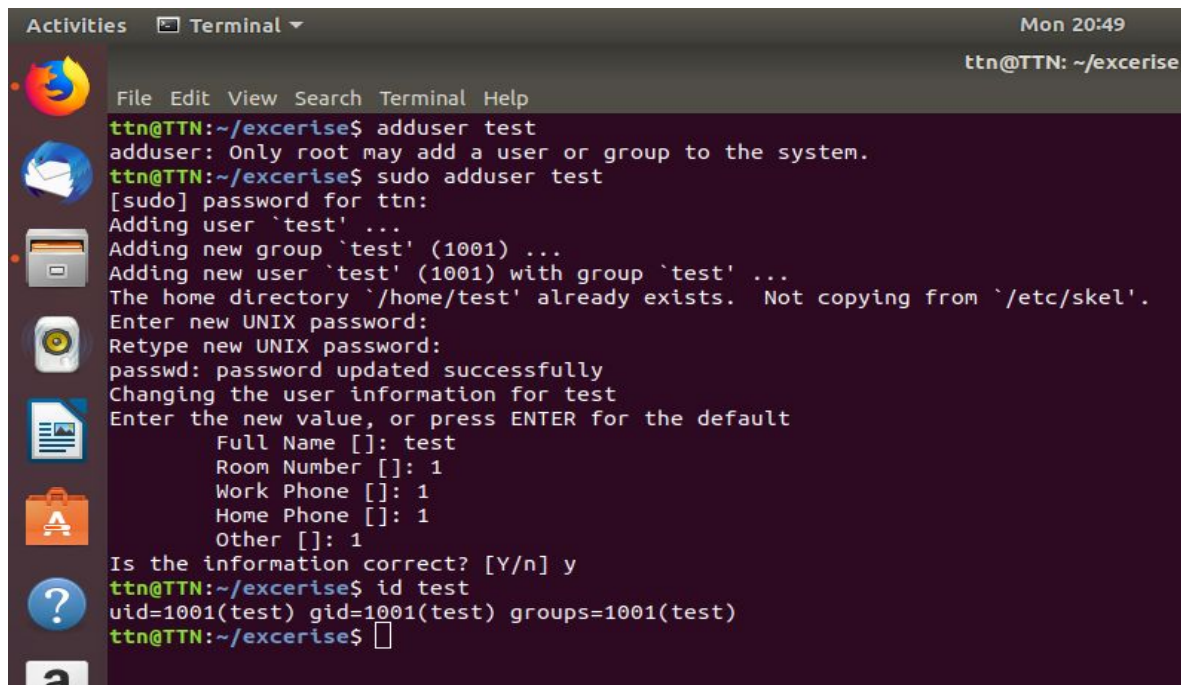
6. Find out the number of line in password_backup containing "/bin/false".

7. Get the first 5 lines of a file "password_backup" and Redirect the output of the above commands into file "output".

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (M, ttn@TTN). The terminal shows the execution of three commands: 'grep /bin/false passwd_backup |wc -l' which outputs '5', 'head -5 passwd_backup > output', and 'cat output' which displays the first five lines of the password_backup file.

```
ttn@TTN:~/exercise$ grep /bin/false passwd_backup |wc -l
5
ttn@TTN:~/exercise$ head -5 passwd_backup > output
ttn@TTN:~/exercise$ cat output
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
ttn@TTN:~/exercise$
```

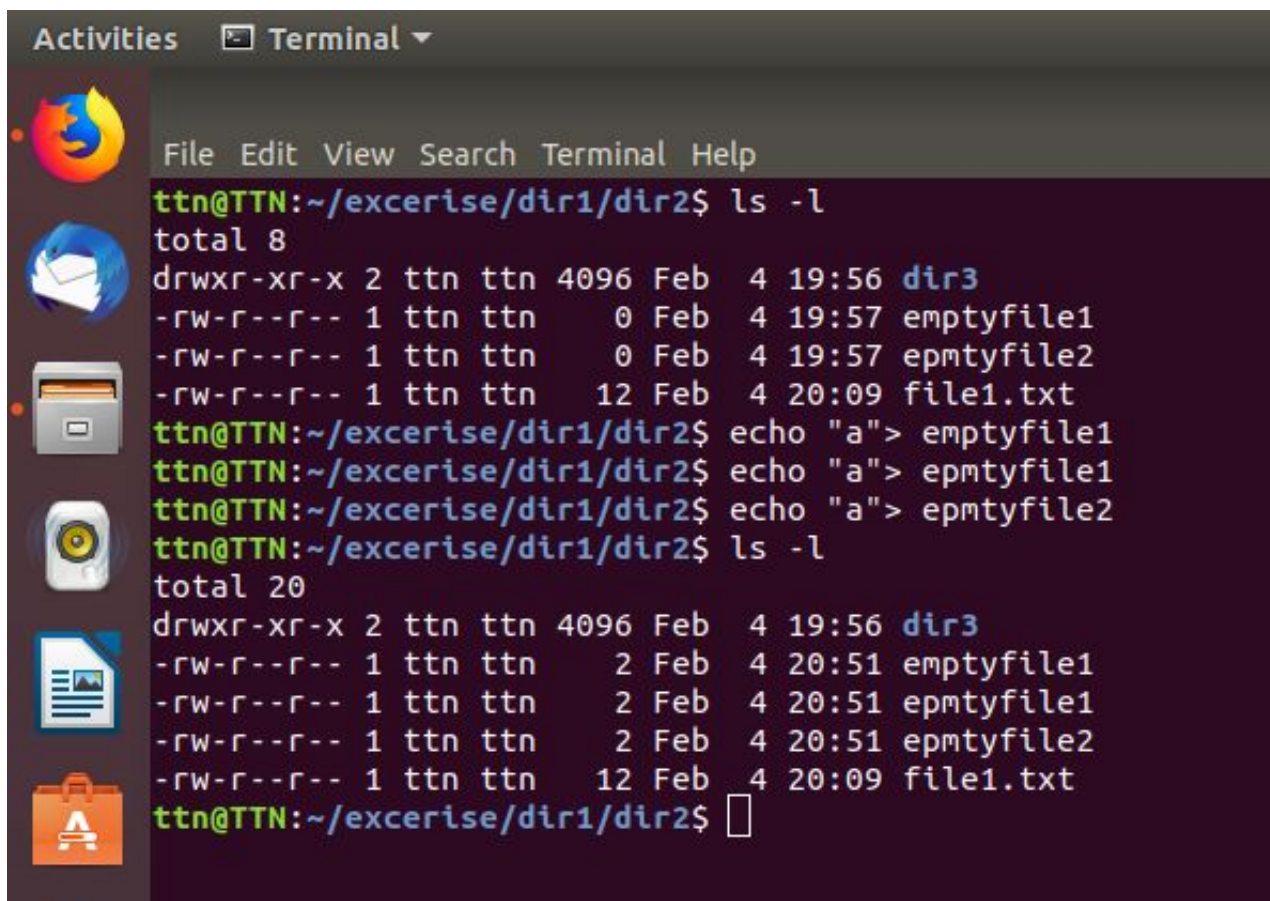
8. Create a "test" user, create its password and find out its uid and gid.

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:49, ttn@TTN: ~/excerise). The terminal shows the following commands and output:

```
ttn@TTN:~/excerise$ adduser test
adduser: Only root may add a user or group to the system.
ttn@TTN:~/excerise$ sudo adduser test
[sudo] password for ttn:
Adding user `test' ...
Adding new group `test' (1001) ...
Adding new user `test' (1001) with group `test' ...
The home directory `/home/test' already exists. Not copying from `/etc/skel'.
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for test
Enter the new value, or press ENTER for the default
Full Name []: test
Room Number []: 1
Work Phone []: 1
Home Phone []: 1
Other []: 1
Is the information correct? [Y/n] y
ttn@TTN:~/excerise$ id test
uid=1001(test) gid=1001(test) groups=1001(test)
ttn@TTN:~/excerise$
```

9.

Change the timestamp of emptyFile1, emptyFile2 which are exist in dir2

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:49, ttn@TTN: ~/excerise). The terminal shows the following commands and output:

```
ttn@TTN:~/excerise/dir1/dir2$ ls -l
total 8
drwxr-xr-x 2 ttn ttn 4096 Feb  4 19:56 dir3
-rw-r--r-- 1 ttn ttn  0 Feb  4 19:57 emptyfile1
-rw-r--r-- 1 ttn ttn  0 Feb  4 19:57 emptyfile2
-rw-r--r-- 1 ttn ttn 12 Feb  4 20:09 file1.txt
ttn@TTN:~/excerise/dir1/dir2$ echo "a"> emptyfile1
ttn@TTN:~/excerise/dir1/dir2$ echo "a"> emptyfile1
ttn@TTN:~/excerise/dir1/dir2$ echo "a"> emptyfile2
ttn@TTN:~/excerise/dir1/dir2$ ls -l
total 20
drwxr-xr-x 2 ttn ttn 4096 Feb  4 19:56 dir3
-rw-r--r-- 1 ttn ttn  2 Feb  4 20:51 emptyfile1
-rw-r--r-- 1 ttn ttn  2 Feb  4 20:51 emptyfile1
-rw-r--r-- 1 ttn ttn  2 Feb  4 20:51 emptyfile2
-rw-r--r-- 1 ttn ttn 12 Feb  4 20:09 file1.txt
ttn@TTN:~/excerise/dir1/dir2$
```


10. Login as test user and edit the "output" file created above. Since the permission wont allow you to save the changes. Configure such that test user can edit it.

1. Add group owner of the "output" file as the secondary group of testuser and check/change the "output" file permission if it is editable by group. Once done revert the changes
2. Make the file editable to the world so that test user can access it. Revert the changes after verification
3. Change the ownership to edit the file.

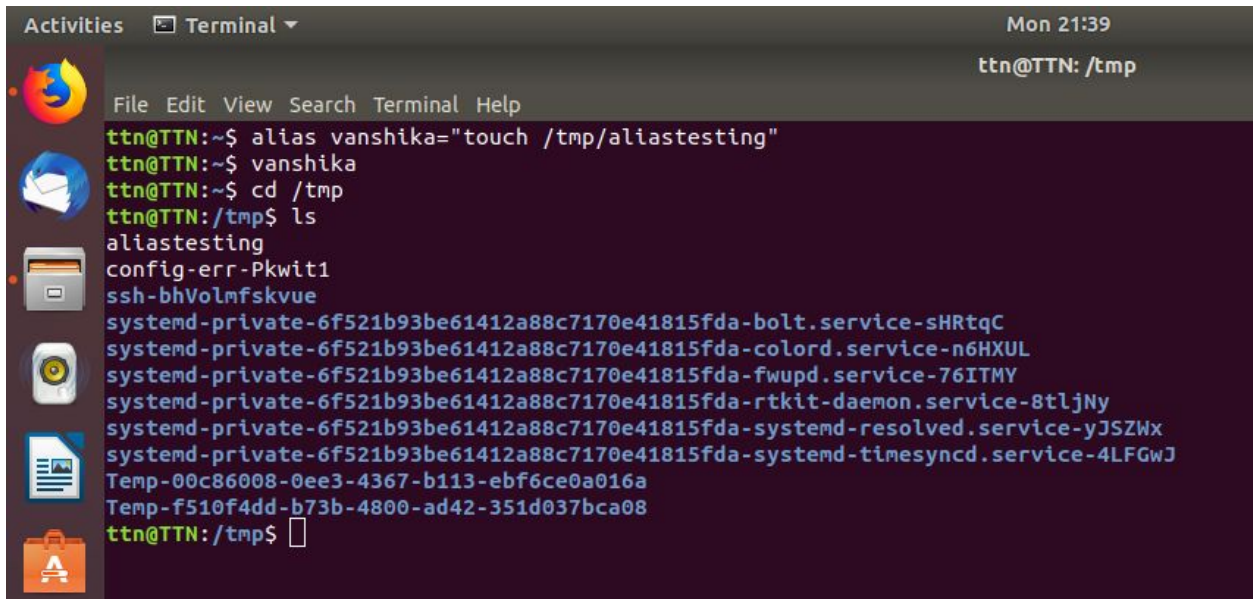
```
Activities Terminal
File Edit View Search Terminal Help
test@TTN:/home/ttn/exercise$ cat output
hello
test@TTN:/home/ttn/exercise$ exit
exit
ttn@TTN:~/exercise$ sudo chmod 644 output
ttn@TTN:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  4 19:56 dir1
-rw-r--r-- 1 ttn ttn  6 Feb  4 21:15 output
-rw-r--r-- 1 ttn ttn 2398 Feb  4 20:16 passwd_backup
ttn@TTN:~/exercise$ sudo chmod 647 output
ttn@TTN:~/exercise$ su test
Password:
test@TTN:/home/ttn/exercise$ echo "hello1">output
bash: output: Permission denied
test@TTN:/home/ttn/exercise$ exit
exit
ttn@TTN:~/exercise$ echo "hi">output
hi
ttn@TTN:~/exercise$ cat output
hi
ttn@TTN:~/exercise$ sudo chmod 644 output
ttn@TTN:~/exercise$ sudo chown test output
ttn@TTN:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  4 19:56 dir1
-rw-r--r-- 1 test ttn  3 Feb  4 21:17 output
-rw-r--r-- 1 ttn ttn 2398 Feb  4 20:16 passwd_backup
ttn@TTN:~/exercise$ su test
Password:
test@TTN:/home/ttn/exercise$ echo "hello1">output
test@TTN:/home/ttn/exercise$ cat
output
output
^Z
[1]+  Stopped                  cat
test@TTN:/home/ttn/exercise$ cat output
hello1
test@TTN:/home/ttn/exercise$
```

1. Sudo usermod -G ttn -a test (to make group of output a secondary group of test user)
2. Sudo chmod 674 output (check/change the "output" file permission if it is editable by group)
3. Su test (enter test user to verify)
4. Echo "hello" > output -success
5. Exit test user
6. Sudo chmod 644 output (revert changes back)

```
Activities Terminal
File Edit View Search Terminal Help
ttn@TTN:~/exercise$ id test
uid=1001(test) gid=1001(test) groups=1001(test)
ttn@TTN:~/exercise$ sudo usermod -G ttn -a test
ttn@TTN:~/exercise$ id test
uid=1001(test) gid=1001(test) groups=1001(test),1000(ttn)
ttn@TTN:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  4 19:56 dir1
-rw-r--r-- 1 ttn ttn  189 Feb  4 21:12 output
-rw-r--r-- 1 ttn ttn 2398 Feb  4 20:16 passwd_backup
ttn@TTN:~/exercise$ sudo chmod 674 output
ttn@TTN:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  4 19:56 dir1
-rw-rwxr-- 1 ttn ttn  189 Feb  4 21:12 output
-rw-r--r-- 1 ttn ttn 2398 Feb  4 20:16 passwd_backup
ttn@TTN:~/exercise$ su test
Password:
test@TTN:/home/ttn/exercise$ echo "hello">output
test@TTN:/home/ttn/exercise$ cat output
hello
test@TTN:/home/ttn/exercise$ exit
exit
ttn@TTN:~/exercise$ sudo chmod 644 output
ttn@TTN:~/exercise$ ls -l
total 12
drwxr-xr-x 3 ttn ttn 4096 Feb  4 19:56 dir1
-rw-r--r-- 1 ttn ttn  189 Feb  4 21:15 output
-rw-r--r-- 1 ttn ttn 2398 Feb  4 20:16 passwd_backup
ttn@TTN:~/exercise$ sudo chmod 647 output
ttn@TTN:~/exercise$ su test
Password:
test@TTN:/home/ttn/exercise$ echo "hello1">output
bash: output: Permission denied
test@TTN:/home/ttn/exercise$ exit
exit
ttn@TTN:~/exercise$ echo "hi">output
ttn@TTN:~/exercise$ cat output
```

1. Sudo chmod 647 output
2. Su test
3. Echo "hi">output - denied
4. Exit
5. Sudo chmod 644 output
6. Sudo chown test output
7. Su test
8. Echo "abc" >output - success
9. Exit

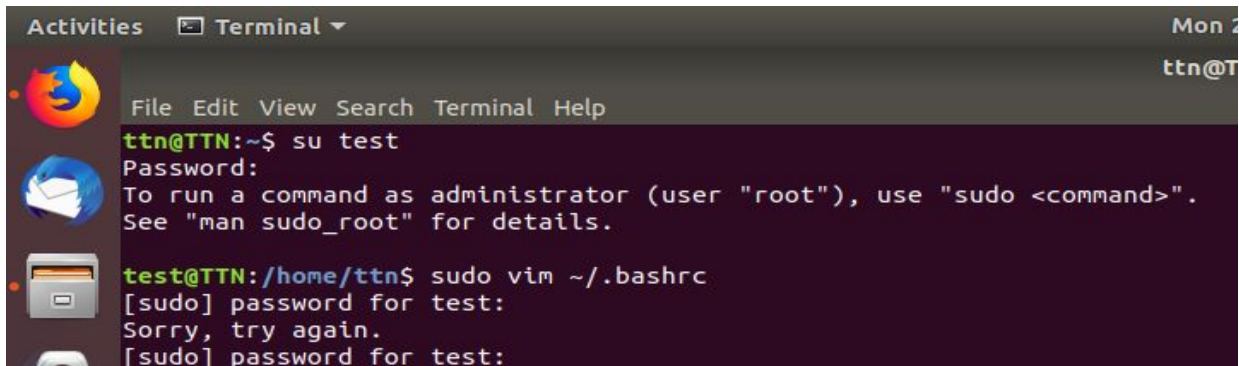
11. Create alias with your name so that it creates a file as "/tmp/aliastesting".



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 21:39, ttn@TTN: /tmp). The user 'ttn@TTN' enters the command 'alias vanshika="touch /tmp/aliastesting"', followed by 'vanshika', 'cd /tmp', and 'ls'. The 'ls' command lists the contents of the /tmp directory, including 'aliastesting', 'config-err-Pkwit1', 'ssh-bhVolmfskvue', and several systemd-private directories. The prompt returns to 'ttn@TTN: /tmp\$'.

```
Activities Terminal Mon 21:39 ttn@TTN: /tmp
File Edit View Search Terminal Help
ttn@TTN:~$ alias vanshika="touch /tmp/aliastesting"
ttn@TTN:~$ vanshika
ttn@TTN:~$ cd /tmp
ttn@TTN:/tmp$ ls
aliastesting
config-err-Pkwit1
ssh-bhVolmfskvue
systemd-private-6f521b93be61412a88c7170e41815fda-bolt.service-sHRTqC
systemd-private-6f521b93be61412a88c7170e41815fda-colord.service-n6HXUL
systemd-private-6f521b93be61412a88c7170e41815fda-fwupd.service-76ITMY
systemd-private-6f521b93be61412a88c7170e41815fda-rtkit-daemon.service-8tljNy
systemd-private-6f521b93be61412a88c7170e41815fda-systemd-resolved.service-yJSZWx
systemd-private-6f521b93be61412a88c7170e41815fda-systemd-timesyncd.service-4LFGwJ
Temp-00c86008-0ee3-4367-b113-ebf6ce0a016a
Temp-f510f4dd-b73b-4800-ad42-351d037bca08
ttn@TTN:/tmp$
```

12. Edit ~/.bashrc file such that when you change to "test" user it should clear the screen and print "Welcome".



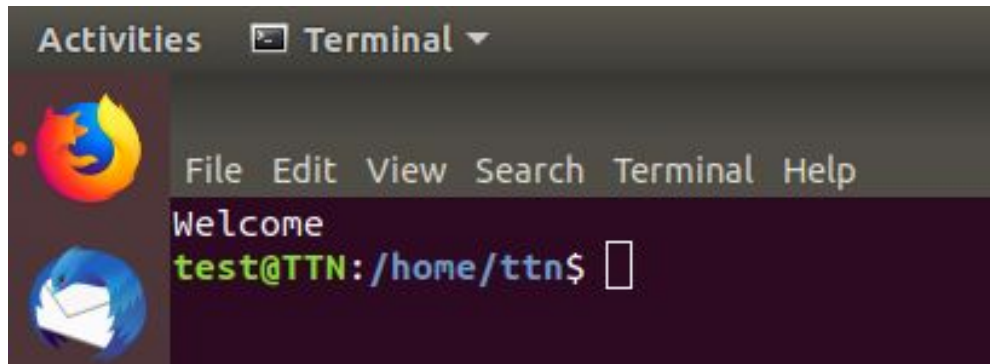
A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 2, ttn@T). The user 'ttn@TTN' enters 'su test'. A password prompt is shown, followed by a message: 'To run a command as administrator (user "root"), use "sudo <command>". See "man sudo_root" for details.' The prompt changes to 'test@TTN: /home/ttn\$'. The user enters 'sudo vim ~/.bashrc'. A password prompt is shown, followed by 'Sorry, try again.' and another password prompt.

```
Activities Terminal Mon 2 ttn@T
File Edit View Search Terminal Help
ttn@TTN:~$ su test
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
test@TTN: /home/ttn$ sudo vim ~/.bashrc
[sudo] password for test:
Sorry, try again.
[sudo] password for test:
```

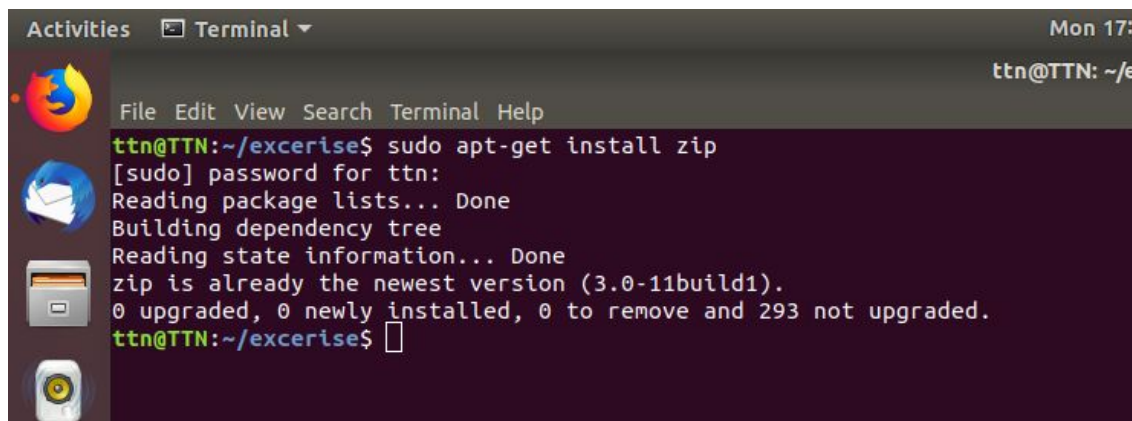


A terminal window showing the contents of the .bashrc file being edited in vim. The text includes a comment '#to clear screen and print welcome', the command 'clear', the command 'echo "Welcome"', and the vim status line '-- INSERT --'.

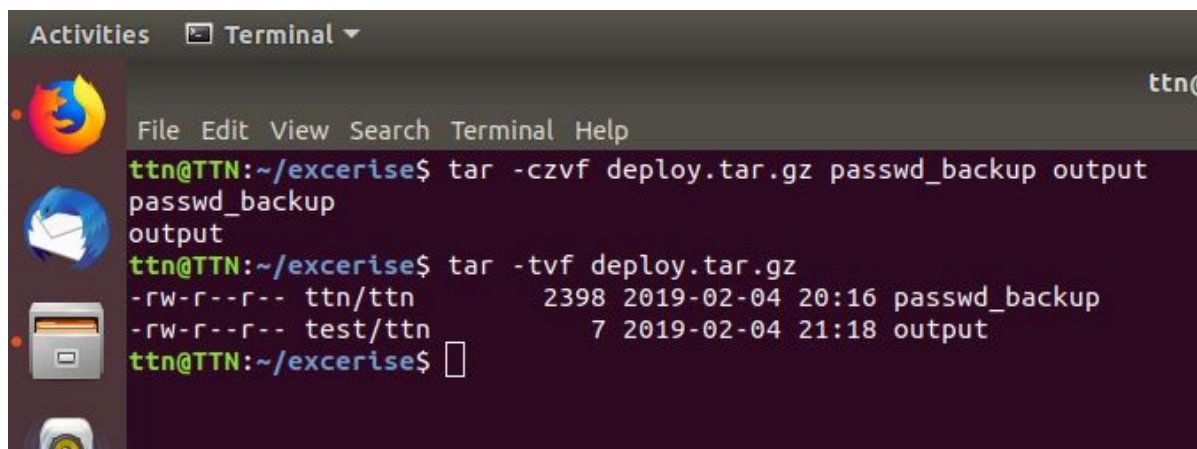
```
..
..
..
#to clear screen and print welcome
clear
echo "Welcome"
-- INSERT --
```



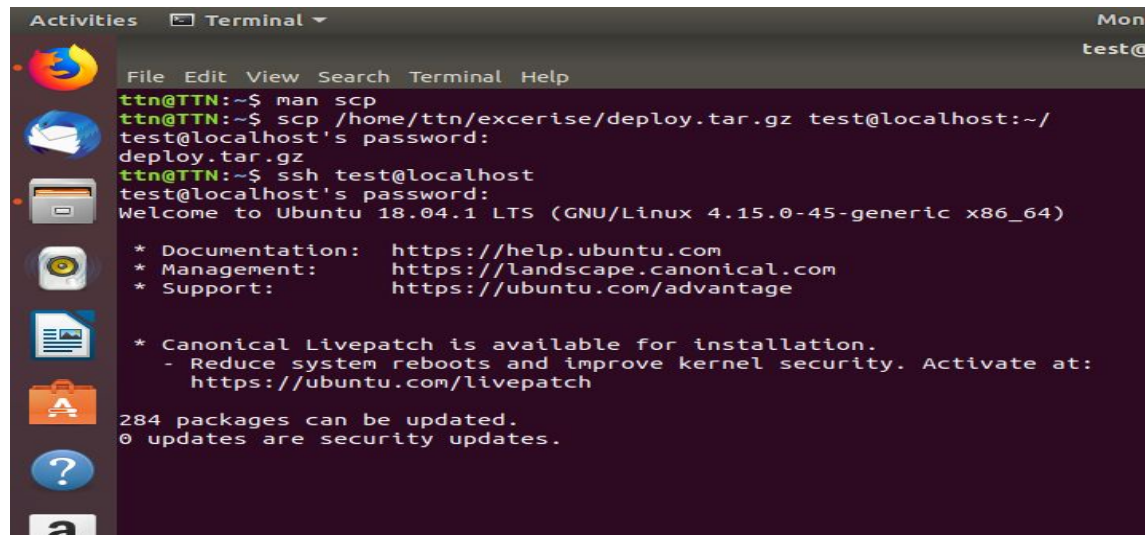
13. Install "zip" package.



14. Compress "output" and "passwd_backup" files into a tar ball. List the files present inside the tar created.



15. scp this file to test user

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help). The user 'ttn' is at host 'TTN'. They run 'man scp' and then 'scp /home/ttn/exercise/deploy.tar.gz test@localhost:~/'. They enter the password for 'test@localhost'. Then they run 'ssh test@localhost' and enter the password. The terminal shows the Ubuntu 18.04.1 LTS login banner with links for documentation, management, and support, and a notification about Canonical Livepatch. At the bottom, it says '284 packages can be updated. 0 updates are security updates.'

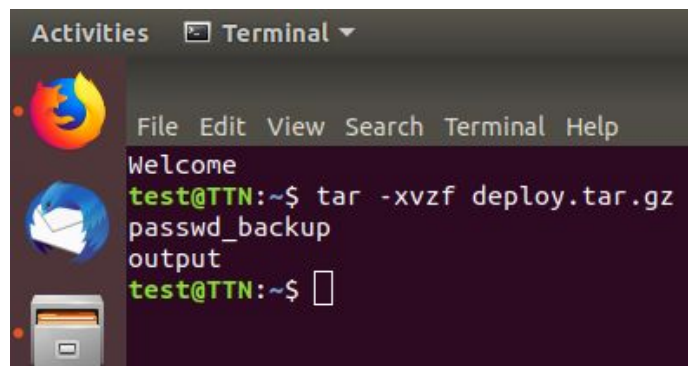
```
ttn@TTN:~$ man scp
ttn@TTN:~$ scp /home/ttn/exercise/deploy.tar.gz test@localhost:~/
test@localhost's password:
deploy.tar.gz
ttn@TTN:~$ ssh test@localhost
test@localhost's password:
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-45-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch


284 packages can be updated.
0 updates are security updates.
```

16. Unzip this tar bar by logging into the remote server

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help). The user 'test' is at host 'TTN'. They run 'tar -xvzf deploy.tar.gz'. The terminal shows the output: 'Welcome', 'passwd_backup', 'output', and then the prompt 'test@TTN:~\$' with a cursor.

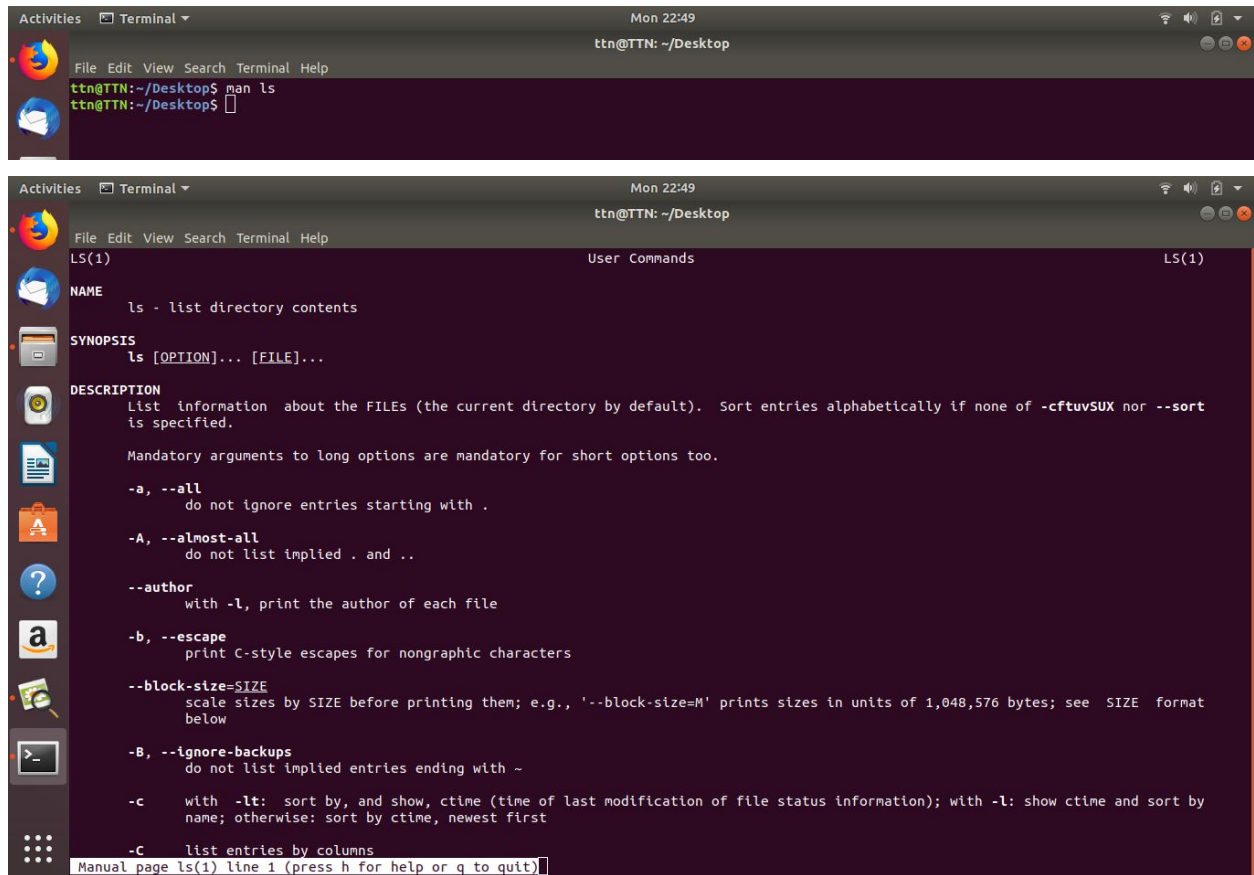
```
test@TTN:~$ tar -xvzf deploy.tar.gz
Welcome
passwd_backup
output
test@TTN:~$
```

17. Download any image from web and move to desktop

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help). The user 'ttn' is at host 'TTN'. They run 'cd Desktop/' and 'ls'. Then they run 'wget https://images.pexels.com/photos/248797/pexels-photo-248797.jpeg?cs=srgb&dl=beach-exotic-holiday-248797.jpg&fm=jpg'. The terminal shows progress bars for two files. Then they run 'ls' and see the files. Finally, they run 'ls' again and see the files. The terminal shows the output of the wget command and the files listed.

```
ttn@TTN:~$ cd Desktop/
ttn@TTN:~/Desktop$ ls
ttn@TTN:~/Desktop$ wget https://images.pexels.com/photos/248797/pexels-photo-248797.jpeg?cs=srgb&dl=beach-exotic-holiday-248797.jpg&fm=jpg
[1] 8776
[2] 8777
ttn@TTN:~/Desktop$
Redirecting output to 'wget-log'.
^C
[1]- Done                  wget https://images.pexels.com/photos/248797/pexels-photo-248797.jpeg?cs=srgb
[2]+ Done                  dl=beach-exotic-holiday-248797.jpg
ttn@TTN:~/Desktop$ ls
'pexels-photo-248797.jpeg?cs=srgb'  wget-log
ttn@TTN:~/Desktop$
```


18. How to get help of commands usages.

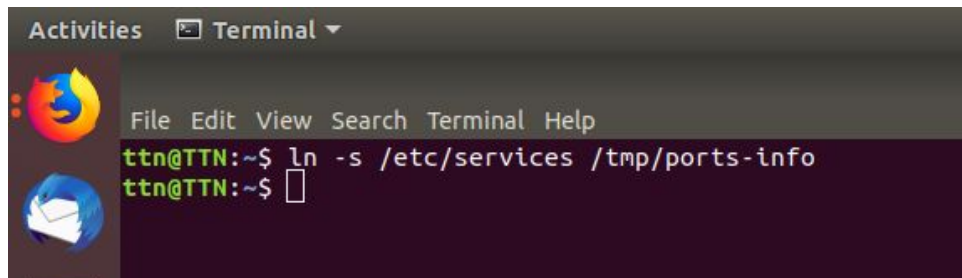


The first screenshot shows a terminal window with the command `man ls` entered. The second screenshot shows the output of the `man ls` command, displaying the manual page for `ls(1)`. The output includes the command name, synopsis, description, and various options.

```
Activities Terminal Mon 22:49
ttn@TTN: ~/Desktop
ttn@TTN:~/Desktop$ man ls
ttn@TTN:~/Desktop$

Activities Terminal Mon 22:49
ttn@TTN: ~/Desktop
LS(1) User Commands LS(1)
NAME
ls - list directory contents
SYNOPSIS
ls [OPTION]... [FILE]...
DESCRIPTION
List information about the FILES (the current directory by default). Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.
Mandatory arguments to long options are mandatory for short options too.
-a, --all
do not ignore entries starting with .
-A, --almost-all
do not list implied . and ..
--author
with -l, print the author of each file
-b, --escape
print C-style escapes for nongraphic characters
--block-size=SIZE
scale sizes by SIZE before printing them; e.g., '--block-size=M' prints sizes in units of 1,048,576 bytes; see SIZE format below
-B, --ignore-backups
do not list implied entries ending with ~
-c
with -lt: sort by, and show, ctime (time of last modification of file status information); with -l: show ctime and sort by name; otherwise: sort by ctime, newest first
-C
list entries by columns
Manual page ls(1) line 1 (press h for help or q to quit)
```

19. Create a symlink of /etc/services into /tmp/ports-info



The screenshot shows a terminal window with the command `ln -s /etc/services /tmp/ports-info` entered and executed.

```
Activities Terminal
File Edit View Search Terminal Help
ttn@TTN:~$ ln -s /etc/services /tmp/ports-info
ttn@TTN:~$
```

```
Activities Terminal Fri 14:15 ● ttn@TTN: /tmp
File Edit View Search Terminal Help
ttn@TTN:/tmp$ ls -l
total 1928
-rw-r----- 1 ttn ttn      0 Feb 15 09:48 config-err-gdivdN
drwx----- 2 ttn ttn    4096 Feb 15 12:17 firefox_ttn
drwxr-xr-x  2 ttn ttn    4096 Feb 15 14:15 hsperrdata_ttn
-rw-r----- 1 ttn ttn 257712 Feb 15 14:15 +-JF1129013925874271145.tmp
-rw-r----- 1 ttn ttn 225992 Feb 15 14:15 +-JF1884893494694066043.tmp
-rw-r----- 1 ttn ttn 223652 Feb 15 14:15 +-JF2264378831806862624.tmp
-rw-r----- 1 ttn ttn 162976 Feb 15 14:15 +-JF335091052189869559.tmp
-rw-r----- 1 ttn ttn 197004 Feb 15 14:15 +-JF4037221224625876563.tmp
-rw-r----- 1 ttn ttn 226328 Feb 15 14:15 +-JF4660756233651608985.tmp
-rw-r----- 1 ttn ttn 225332 Feb 15 14:15 +-JF6078484825382866652.tmp
-rw-r----- 1 ttn ttn  22416 Feb 15 14:15 +-JF6159700106116264089.tmp
-rw-r----- 1 ttn ttn 163624 Feb 15 14:15 +-JF6278850145296069192.tmp
-rw-r----- 1 ttn ttn 197644 Feb 15 14:15 +-JF6579820826734408160.tmp
drwx----- 2 ttn ttn    4096 Feb 15 10:16 mozilla_ttn0
lrwxrwxrwx  1 ttn ttn      13 Feb 15 14:15 ports-info -> /etc/services
drwx----- 2 ttn ttn    4096 Feb 15 09:48 ssh-PbJwLXdKvTY
drwx----- 3 root root    4096 Feb 15 09:48 systemd-private-d9eb5fddf18a47a68addd7ea2c3128e9-bolt.service-35asZx
drwx----- 3 root root    4096 Feb 15 09:48 systemd-private-d9eb5fddf18a47a68addd7ea2c3128e9-color.service-qpezd7
drwx----- 3 root root    4096 Feb 15 09:48 systemd-private-d9eb5fddf18a47a68addd7ea2c3128e9-fwupd.service-uGW1Sf
drwx----- 3 root root    4096 Feb 15 09:48 systemd-private-d9eb5fddf18a47a68addd7ea2c3128e9-rtkit-daemon.service-vntFgG
drwx----- 3 root root    4096 Feb 15 09:47 systemd-private-d9eb5fddf18a47a68addd7ea2c3128e9-systemd-resolved.service-RLbZAT
drwx----- 3 root root    4096 Feb 15 09:47 systemd-private-d9eb5fddf18a47a68addd7ea2c3128e9-systemd-timesyncd.service-EQ13IV
drwx----- 2 ttn ttn    4096 Feb 15 09:50 Temp-00c86008-0ee3-4367-b113-ebf6ce0a016a
drwx----- 2 ttn ttn    4096 Feb 15 09:50 Temp-f510f4dd-b73b-4800-ad42-351d037bca08
ttn@TTN:/tmp$
```

20. You are appointed as a Software/DevOps Engineer in ABC media services. On your first day you need to troubleshoot a problem. There is a command “xyz” somewhere installed in that linux system. But as a new joinee you do not have any idea about where is that Installed. How can you check that

Ans. we can use command - **where is xyz** to find where the command is installed