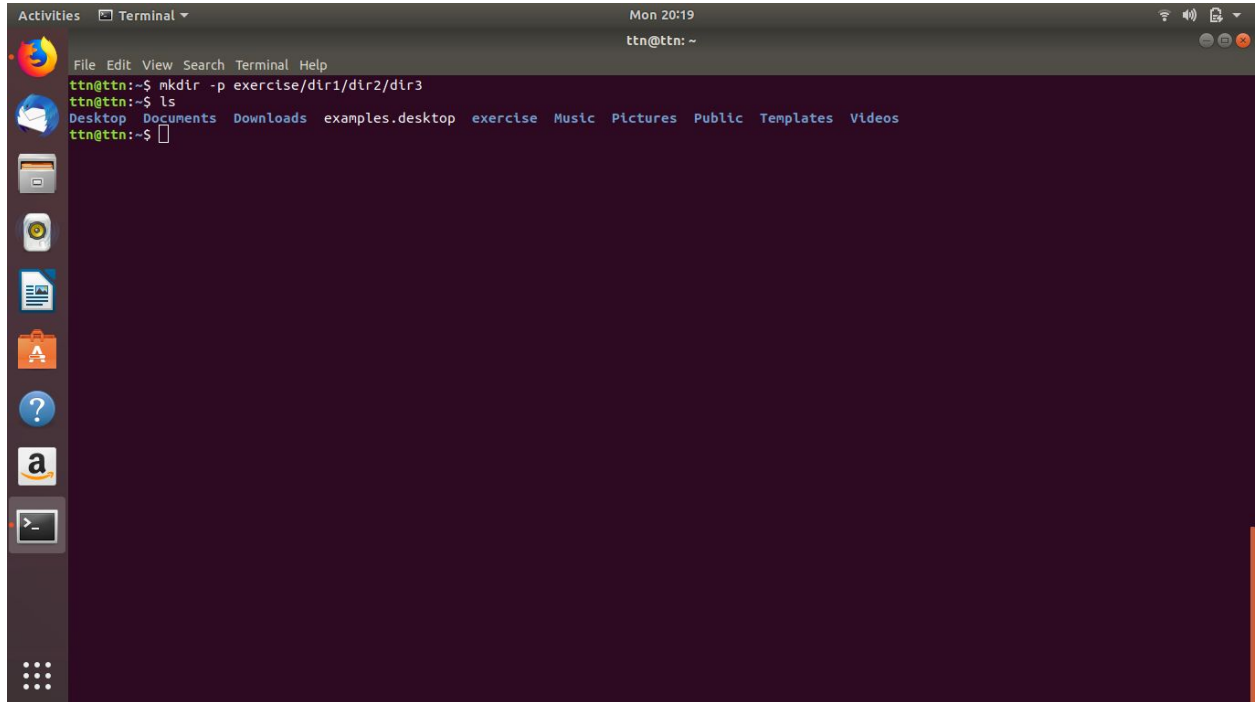


**Name: Adish Jain**

**"Linux Assignment solution"**

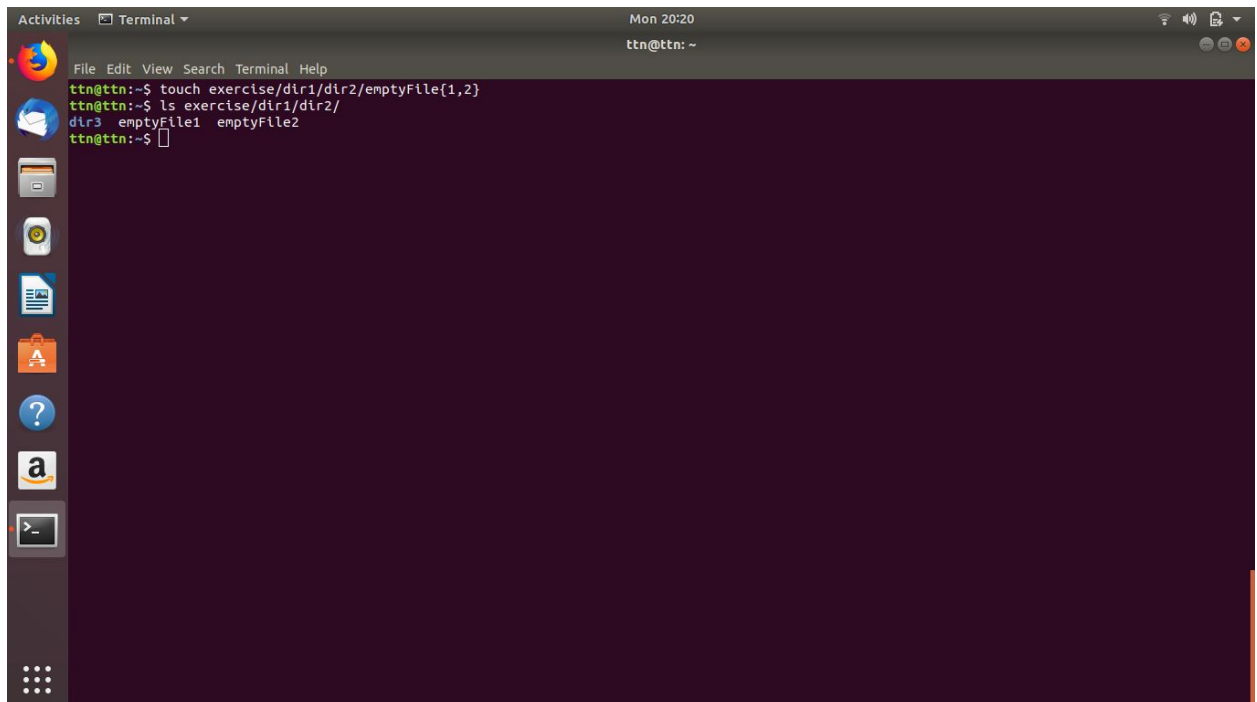
1. Create a directory "exercise" inside your home directory and create nested(dir1/dir2/dir3) directory structure inside "exercise" with single command.



A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:19, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ mkdir -p exercise/dir1/dir2/dir3
ttn@ttn:~$ ls
Desktop  Documents  Downloads  examples.desktop  exercise  Music  Pictures  Public  Templates  Videos
ttn@ttn:~$
```

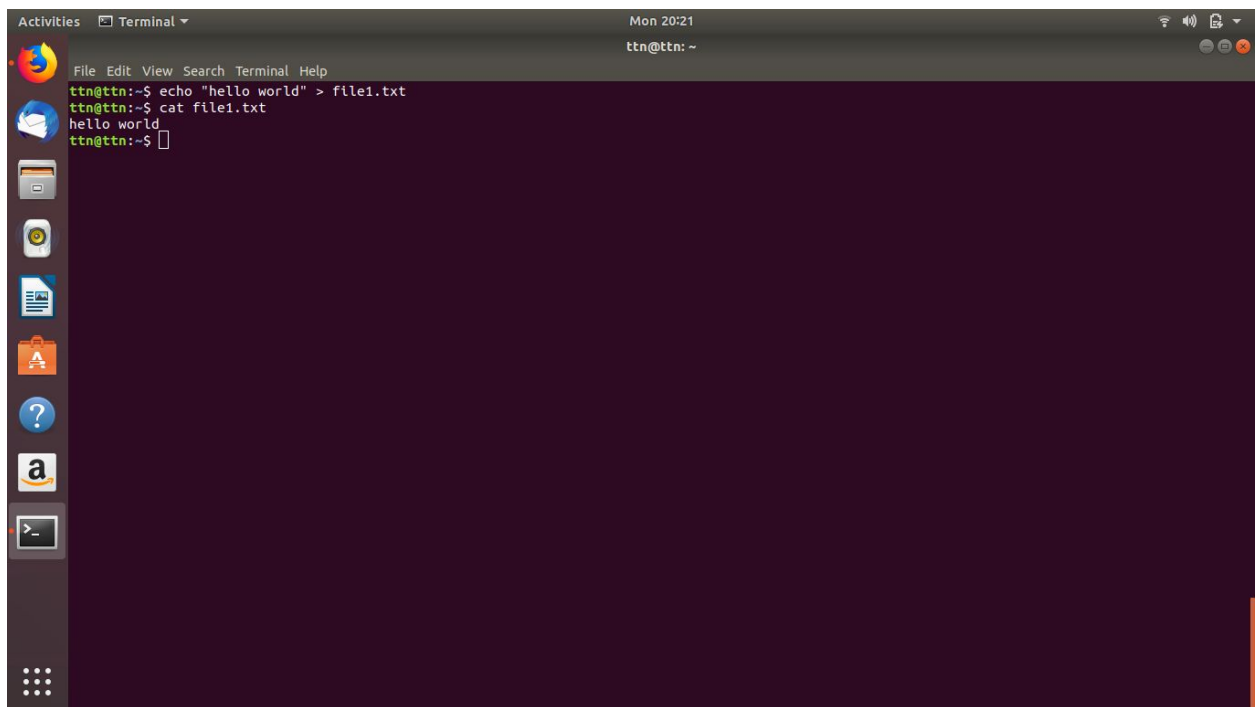
2. Create two empty files inside dir2 directory: emptyFile1, emptyFile2 in single command



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

```
ttn@ttn:~$ touch exercise/dir1/dir2/emptyFile{1,2}
ttn@ttn:~$ ls exercise/dir1/dir2/
dir3  emptyFile1  emptyFile2
ttn@ttn:~$
```

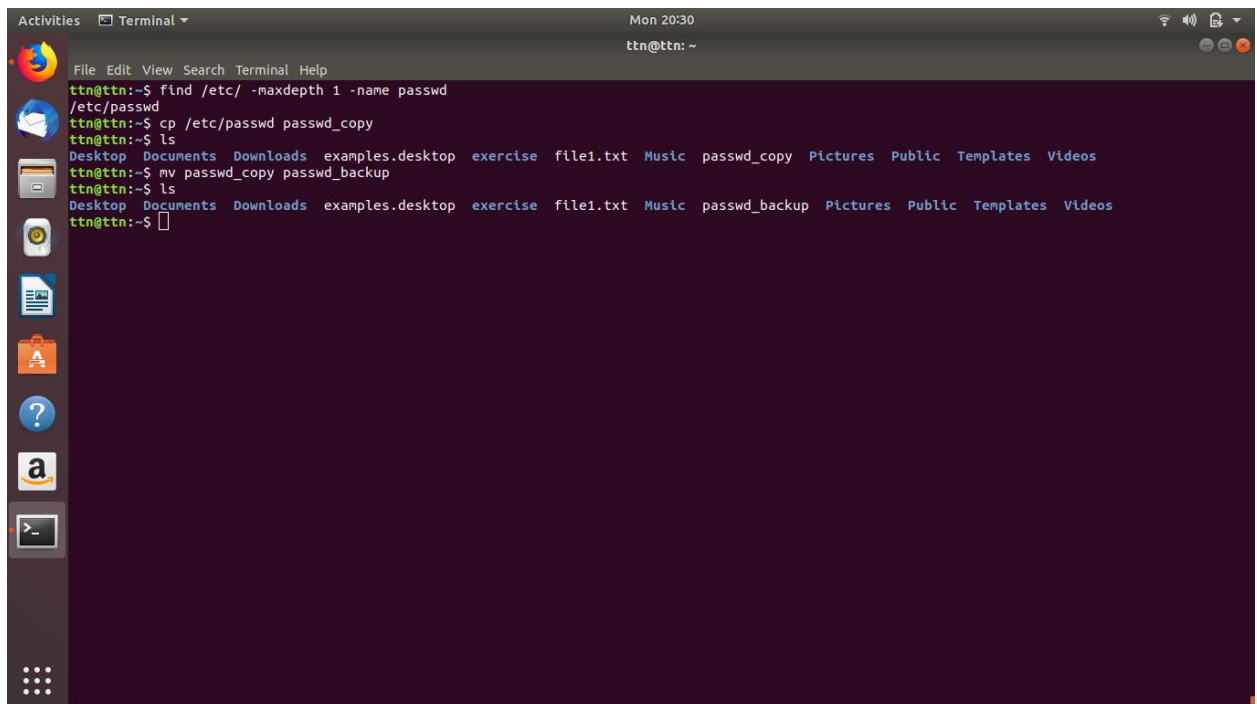
3. Create one file file1.txt containing text "hello world" and save it.



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:21, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ echo "hello world" > file1.txt
ttn@ttn:~$ cat file1.txt
hello world
ttn@ttn:~$
```

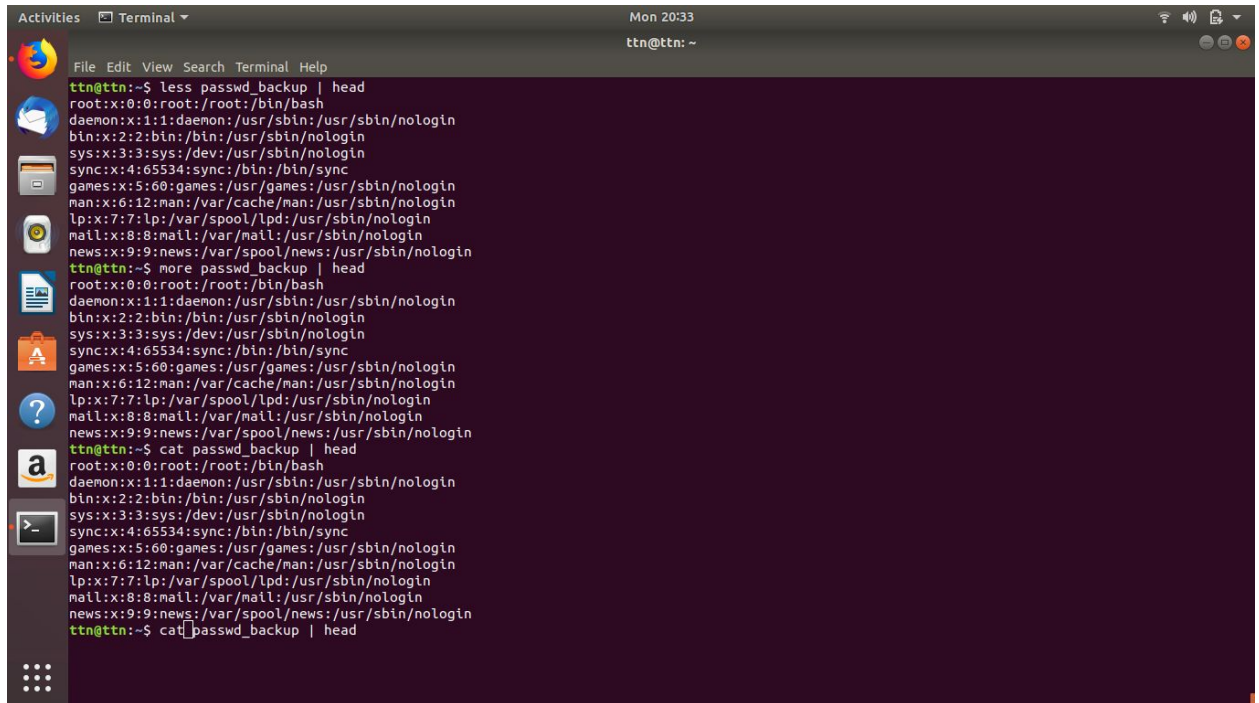
4. Find a "passwd" file using find command inside /etc. copy this files as passwd\_copy and then rename this file as passwd\_backup.



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:30, ttn@ttn: ~). The terminal shows the following commands and output:

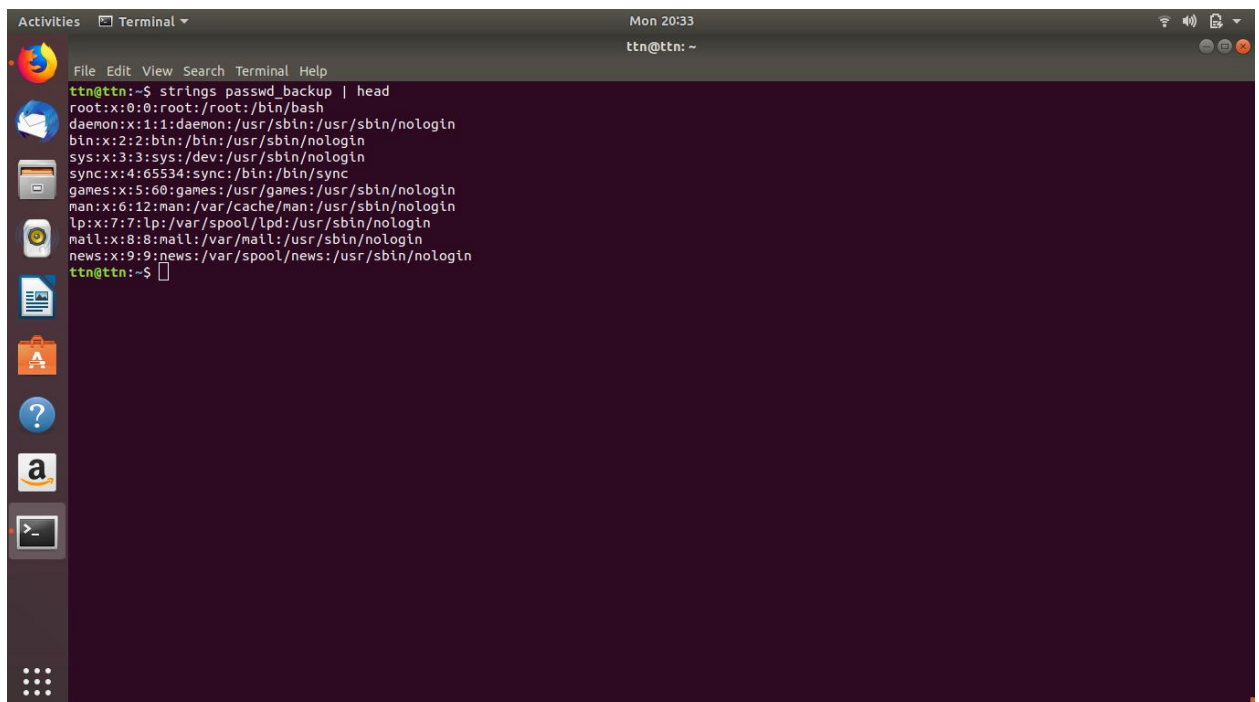
```
ttn@ttn:~$ find /etc/ -maxdepth 1 -name passwd
/etc/passwd
ttn@ttn:~$ cp /etc/passwd passwd_copy
ttn@ttn:~$ ls
Desktop  Documents  Downloads  examples.desktop  exercise  file1.txt  Music  passwd_copy  Pictures  Public  Templates  Videos
ttn@ttn:~$ mv passwd_copy passwd_backup
ttn@ttn:~$ ls
Desktop  Documents  Downloads  examples.desktop  exercise  file1.txt  Music  passwd_backup  Pictures  Public  Templates  Videos
ttn@ttn:~$
```

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



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:33, ttn@ttn: ~). The terminal shows the following commands and output:

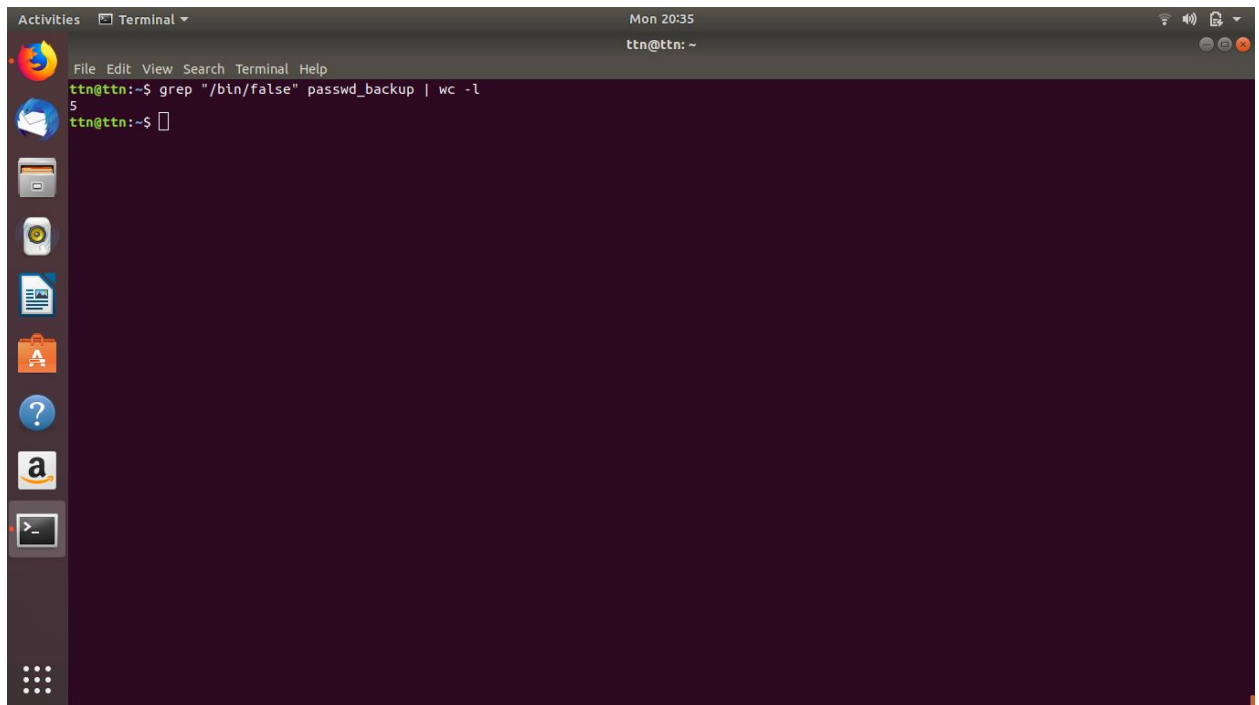
```
ttn@ttn:~$ less passwd_backup | head
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
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
ttn@ttn:~$ more passwd_backup | head
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
ttn@ttn:~$ cat passwd_backup | head
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
ttn@ttn:~$ cat passwd_backup | head
```



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:33, ttn@ttn: ~). The terminal shows the following commands and output:

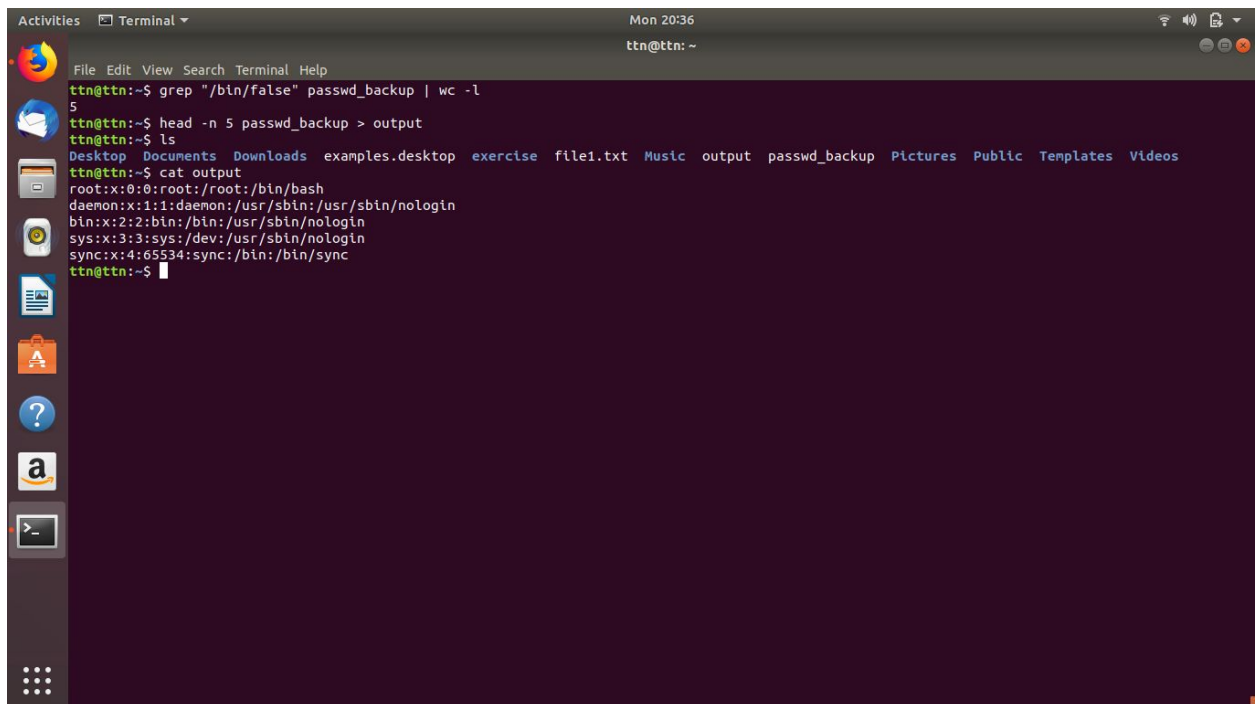
```
ttn@ttn:~$ strings passwd_backup | head
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
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
ttn@ttn:~$
```

6. Find out the number of line in password\_backup containing "/bin/false".



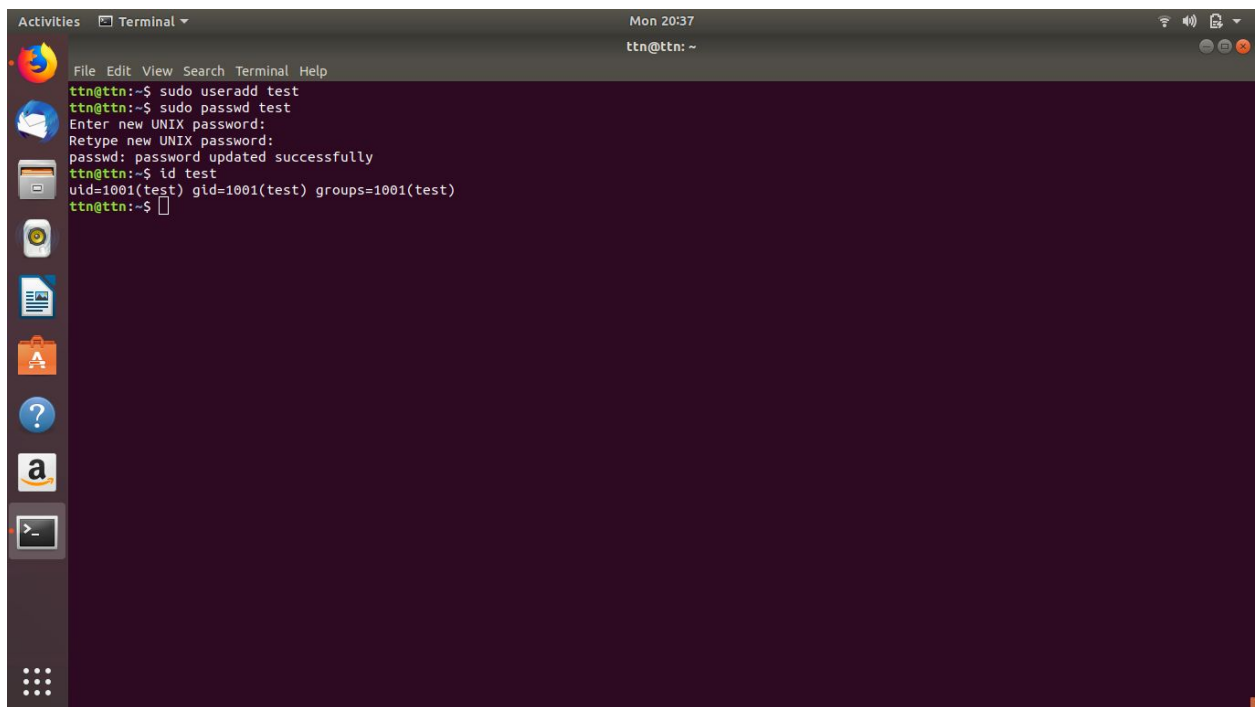
```
Activities Terminal Mon 20:35 ttn@ttn: ~
File Edit View Search Terminal Help
ttn@ttn:~$ grep "/bin/false" passwd_backup | wc -l
5
ttn@ttn:~$
```

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



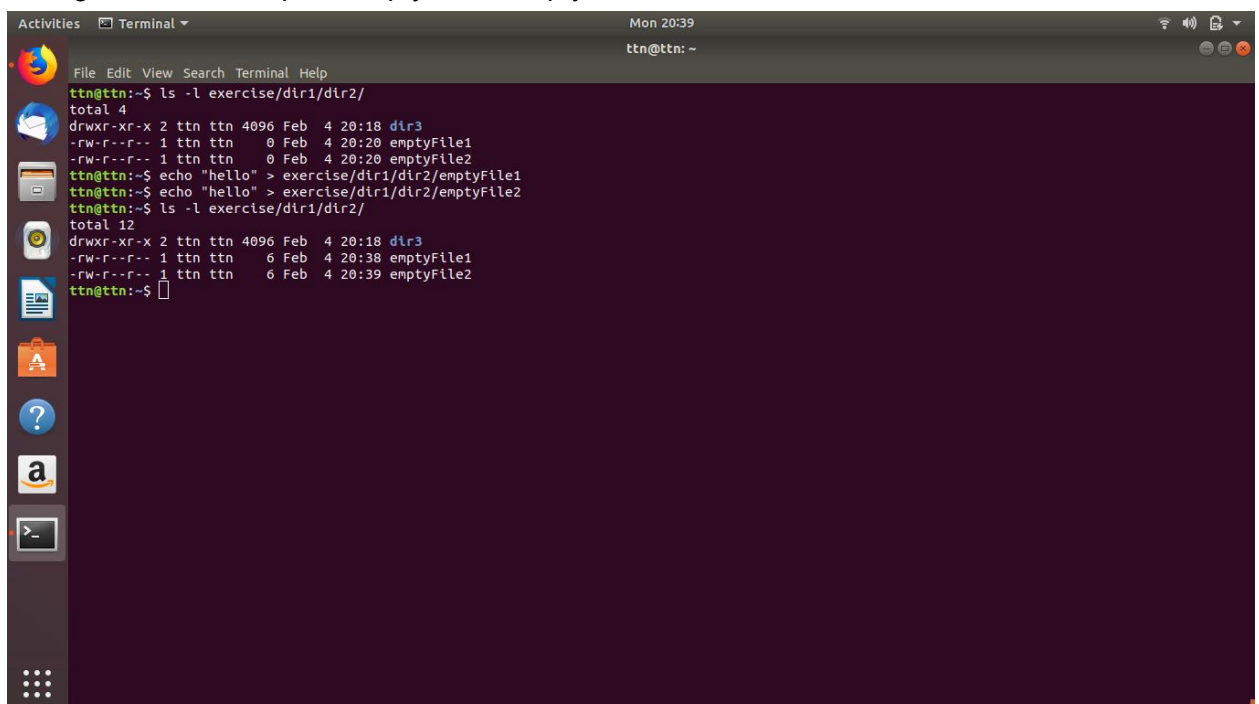
```
Activities Terminal Mon 20:36 ttn@ttn: ~
File Edit View Search Terminal Help
ttn@ttn:~$ grep "/bin/false" passwd_backup | wc -l
5
ttn@ttn:~$ head -n 5 passwd_backup > output
ttn@ttn:~$ ls
Desktop Documents Downloads examples.desktop exercise file1.txt Music output passwd_backup Pictures Public Templates Videos
ttn@ttn:~$ 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:~$
```

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 20:37, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ sudo useradd test
ttn@ttn:~$ sudo passwd test
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
ttn@ttn:~$ id test
uid=1001(test) gid=1001(test) groups=1001(test)
ttn@ttn:~$
```

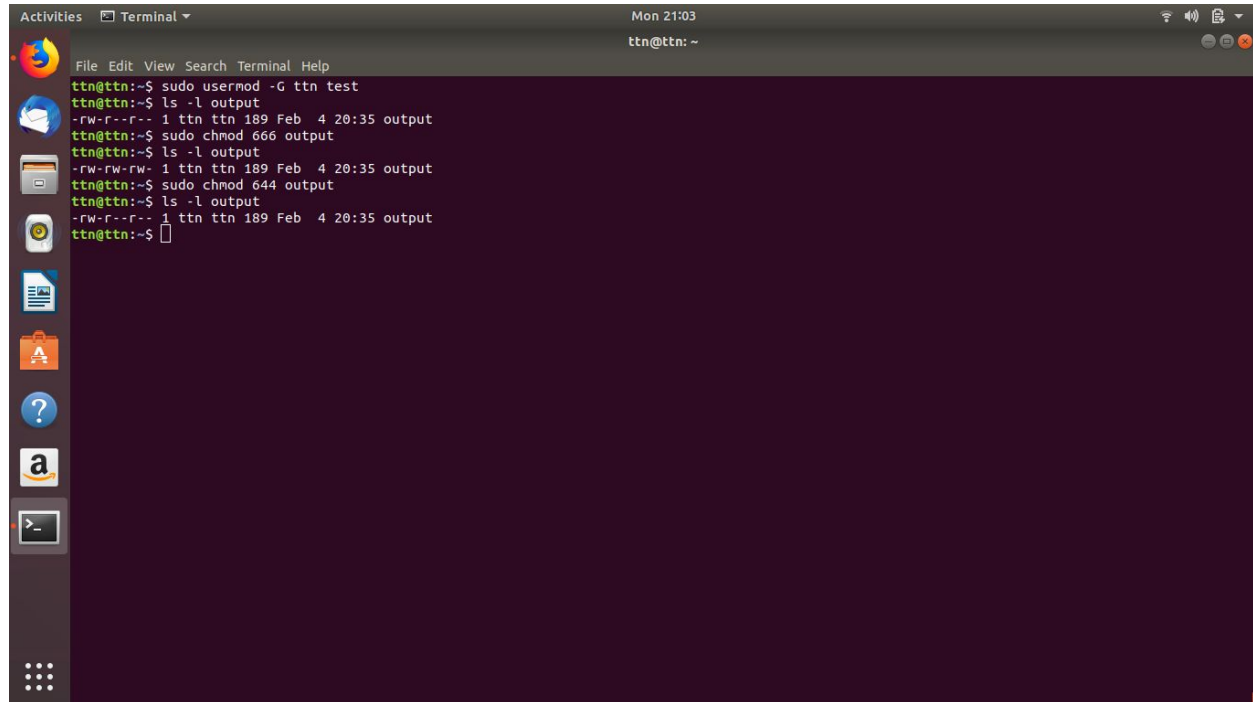
9. Change the timestamp of emptyFile1, emptyFile2 which are exist in dir2

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 20:39, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ ls -l exercise/dir1/dir2/
total 4
drwxr-xr-x 2 ttn ttn 4096 Feb  4 20:18 dir3
-rw-r--r-- 1 ttn ttn  0 Feb  4 20:20 emptyFile1
-rw-r--r-- 1 ttn ttn  0 Feb  4 20:20 emptyFile2
ttn@ttn:~$ echo "hello" > exercise/dir1/dir2/emptyFile1
ttn@ttn:~$ echo "hello" > exercise/dir1/dir2/emptyFile2
ttn@ttn:~$ ls -l exercise/dir1/dir2/
total 12
drwxr-xr-x 2 ttn ttn 4096 Feb  4 20:18 dir3
-rw-r--r-- 1 ttn ttn  6 Feb  4 20:38 emptyFile1
-rw-r--r-- 1 ttn ttn  6 Feb  4 20:39 emptyFile2
ttn@ttn:~$
```

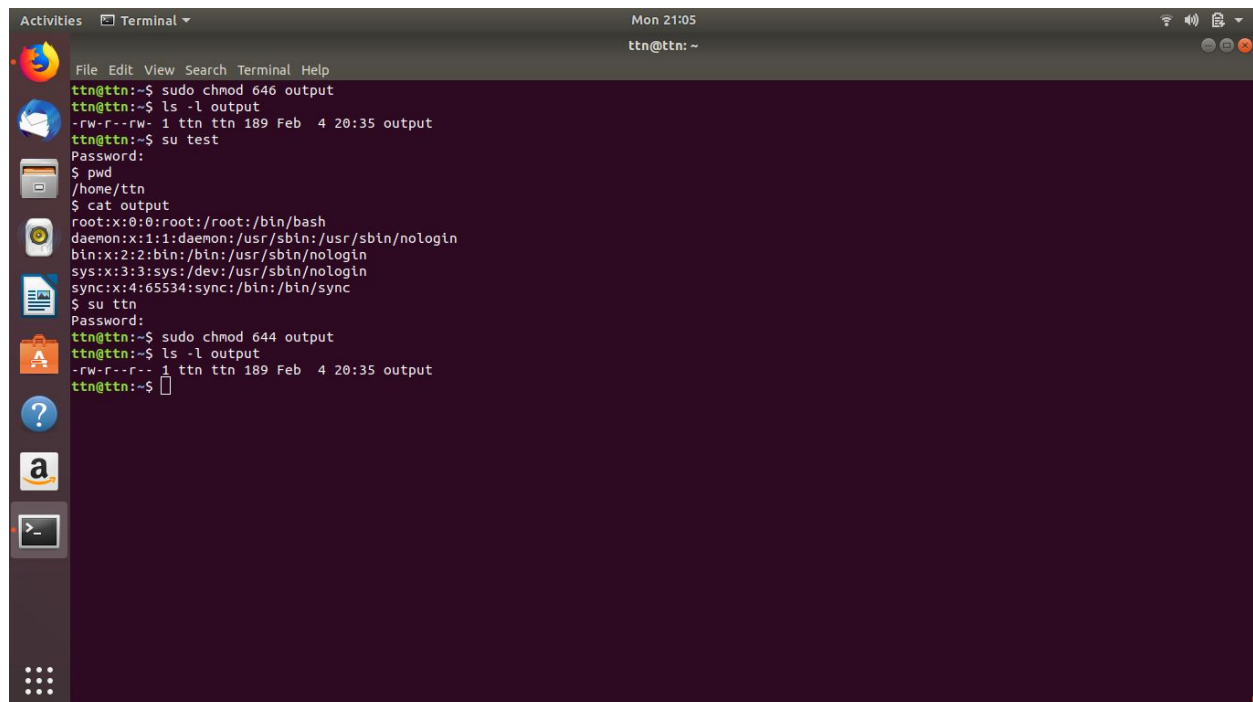
10. Login as test user and edit the "output" file created above. Since the permission won't allow you to save the changes. Configure such that test user can edit it.

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



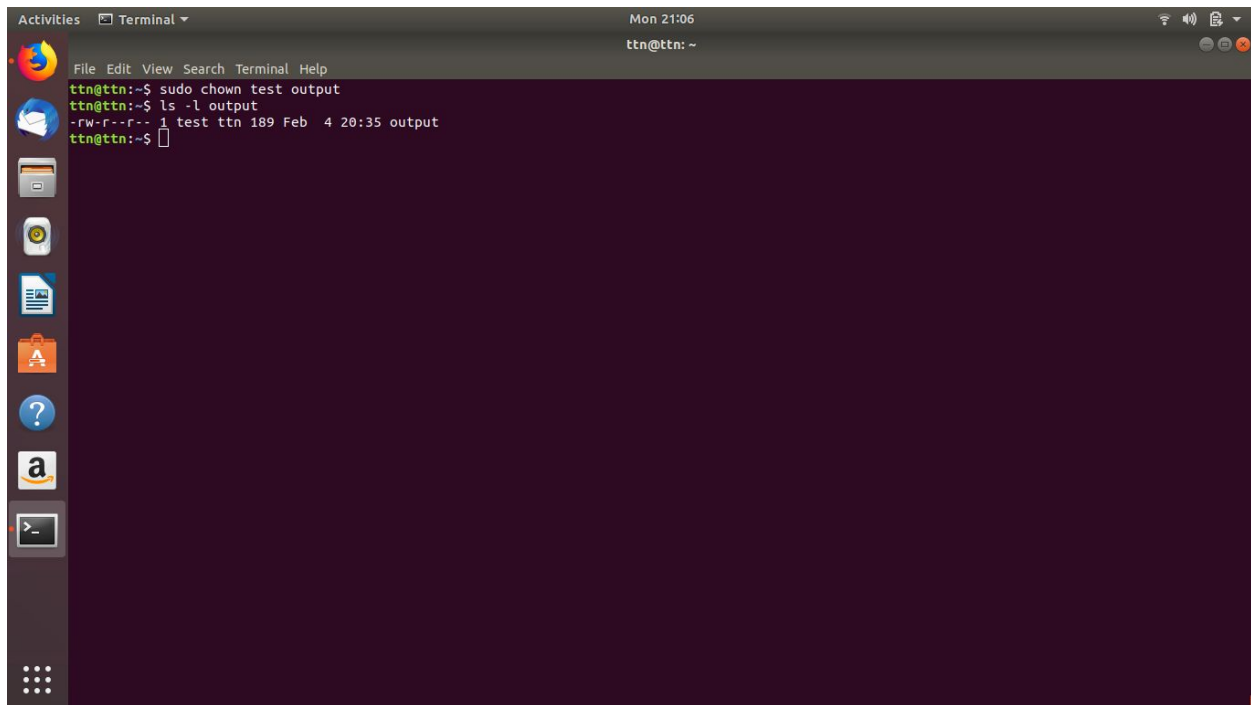
```
Activities Terminal Mon 21:03 ttn@ttn: ~
File Edit View Search Terminal Help
ttn@ttn:~$ sudo usermod -G ttn test
ttn@ttn:~$ ls -l output
-rw-r--r-- 1 ttn ttn 189 Feb  4 20:35 output
ttn@ttn:~$ sudo chmod 666 output
ttn@ttn:~$ ls -l output
-rw-rw-rw- 1 ttn ttn 189 Feb  4 20:35 output
ttn@ttn:~$ sudo chmod 644 output
ttn@ttn:~$ ls -l output
-rw-r--r-- 1 ttn ttn 189 Feb  4 20:35 output
ttn@ttn:~$
```

2. Make the file editable to the world so that test user can access it. Revert the changes after verification



```
Activities Terminal Mon 21:05 ttn@ttn: ~
File Edit View Search Terminal Help
ttn@ttn:~$ sudo chmod 646 output
ttn@ttn:~$ ls -l output
-rw-r--rw- 1 ttn ttn 189 Feb  4 20:35 output
ttn@ttn:~$ su test
Password:
$ pwd
/home/ttn
$ 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
$ su ttn
Password:
ttn@ttn:~$ sudo chmod 644 output
ttn@ttn:~$ ls -l output
-rw-r--r-- 1 ttn ttn 189 Feb  4 20:35 output
ttn@ttn:~$
```

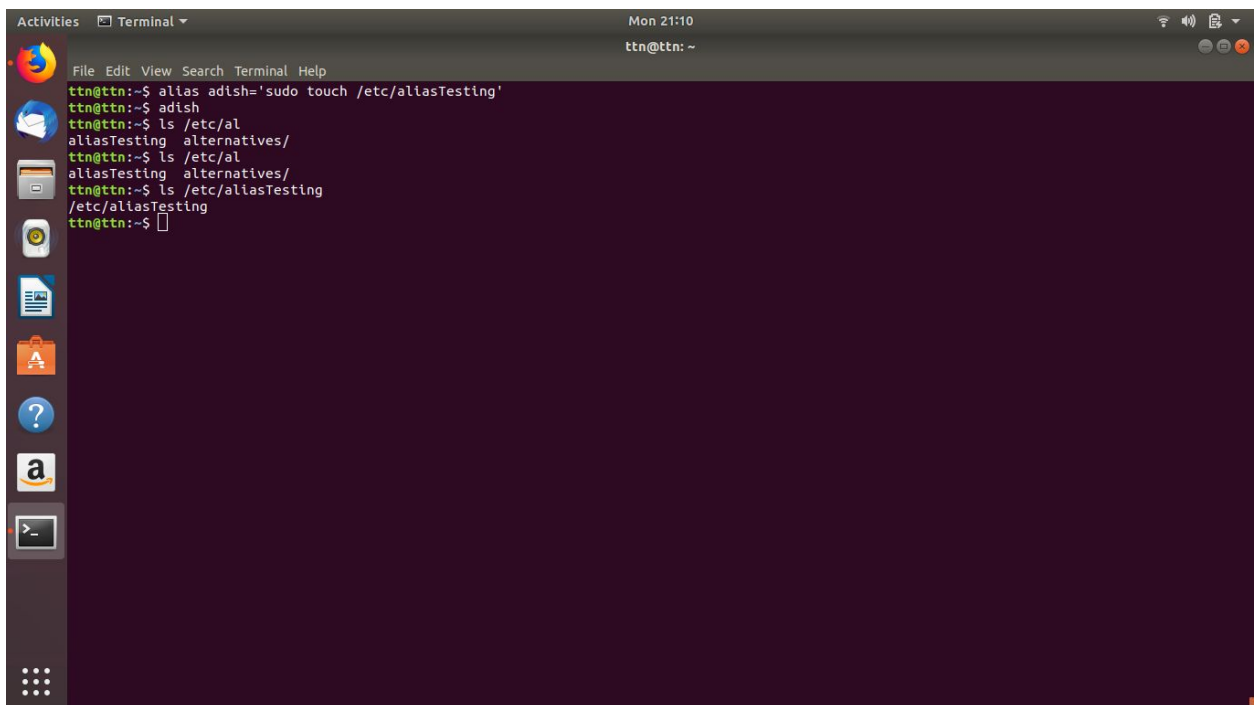
3. Change the ownership to edit the file.



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 21:06, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ sudo chown test output
ttn@ttn:~$ ls -l output
-rw-r--r-- 1 test ttn 189 Feb  4 20:35 output
ttn@ttn:~$
```

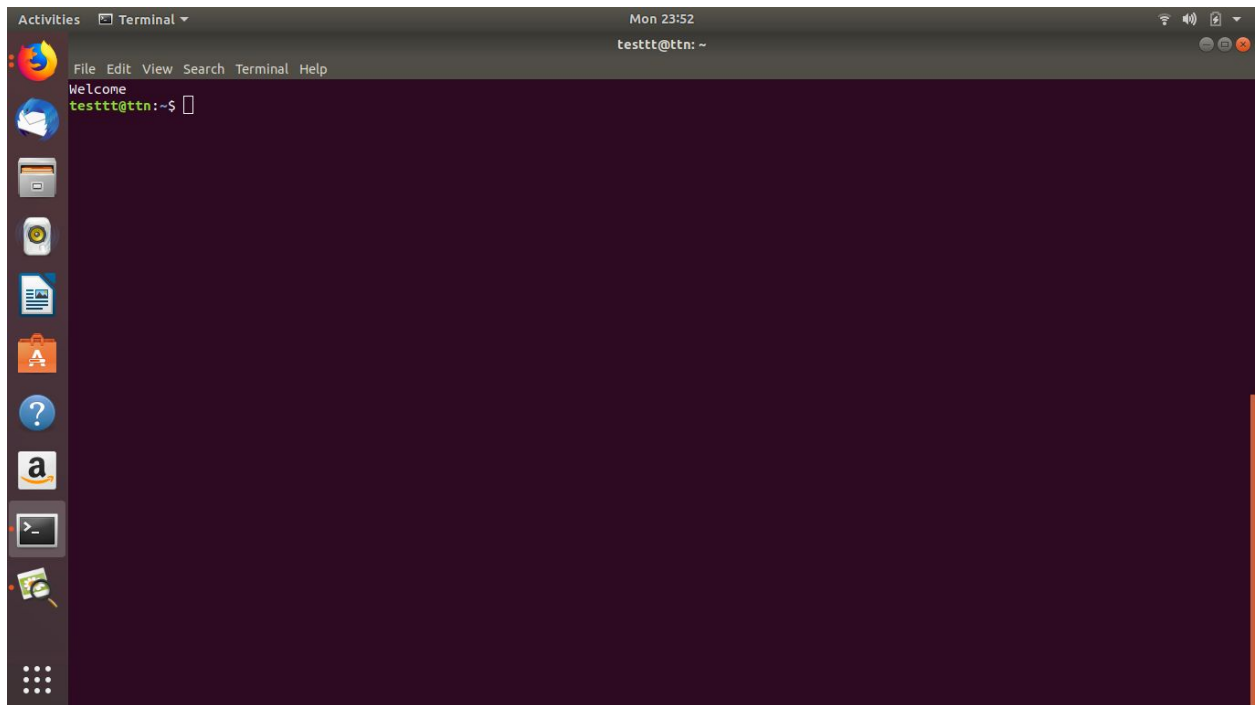
11. Create alias with your name so that it creates a file as "/tmp/aliasTesting".



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 21:10, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ alias adish='sudo touch /etc/aliasTesting'
ttn@ttn:~$ adish
ttn@ttn:~$ ls /etc/al
aliasTesting alternatives/
ttn@ttn:~$ ls /etc/al
aliasTesting alternatives/
ttn@ttn:~$ ls /etc/aliasTesting
/etc/aliasTesting
ttn@ttn:~$
```

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



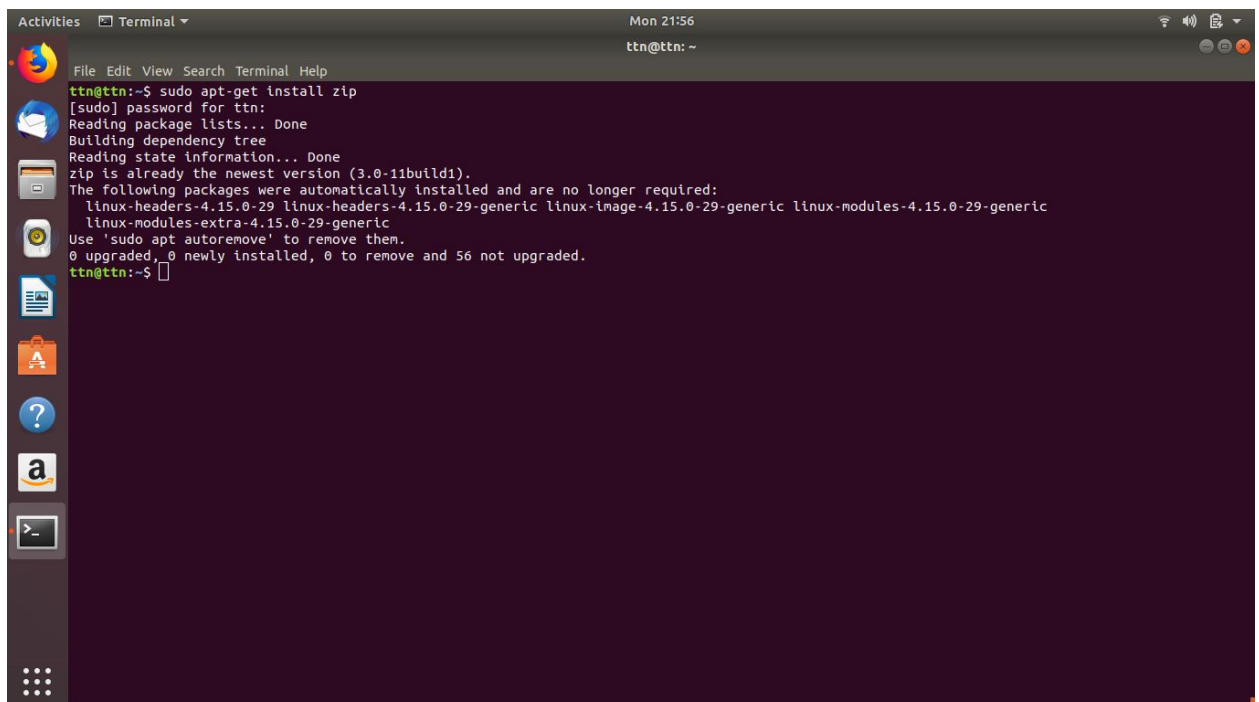
A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 23:52, testtt@ttn: ~). The terminal shows the output of the `testtt@ttn:~$` command, which is "Welcome". The terminal background is dark purple, and the text is white. The left sidebar shows various application icons.

```
testtt@ttn:~$
```

```
Welcome
```

```
testtt@ttn:~$
```

13. Install "zip" package.



A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 21:56, ttn@ttn: ~). The terminal shows the output of the `ttn@ttn:~$ sudo apt-get install zip` command. The output includes the password prompt, package lists, dependency tree, and state information. It also lists packages that were automatically installed and are no longer required, and the final status of the installation.

```
ttn@ttn:~$ sudo apt-get install zip
```

```
[sudo] password for ttn:
```

```
Reading package lists... Done
```

```
Building dependency tree
```

```
Reading state information... Done
```

```
zip is already the newest version (3.0-11build1).
```

```
The following packages were automatically installed and are no longer required:
```

```
linux-headers-4.15.0-29 linux-headers-4.15.0-29-generic linux-image-4.15.0-29-generic linux-modules-4.15.0-29-generic
```

```
linux-modules-extra-4.15.0-29-generic
```

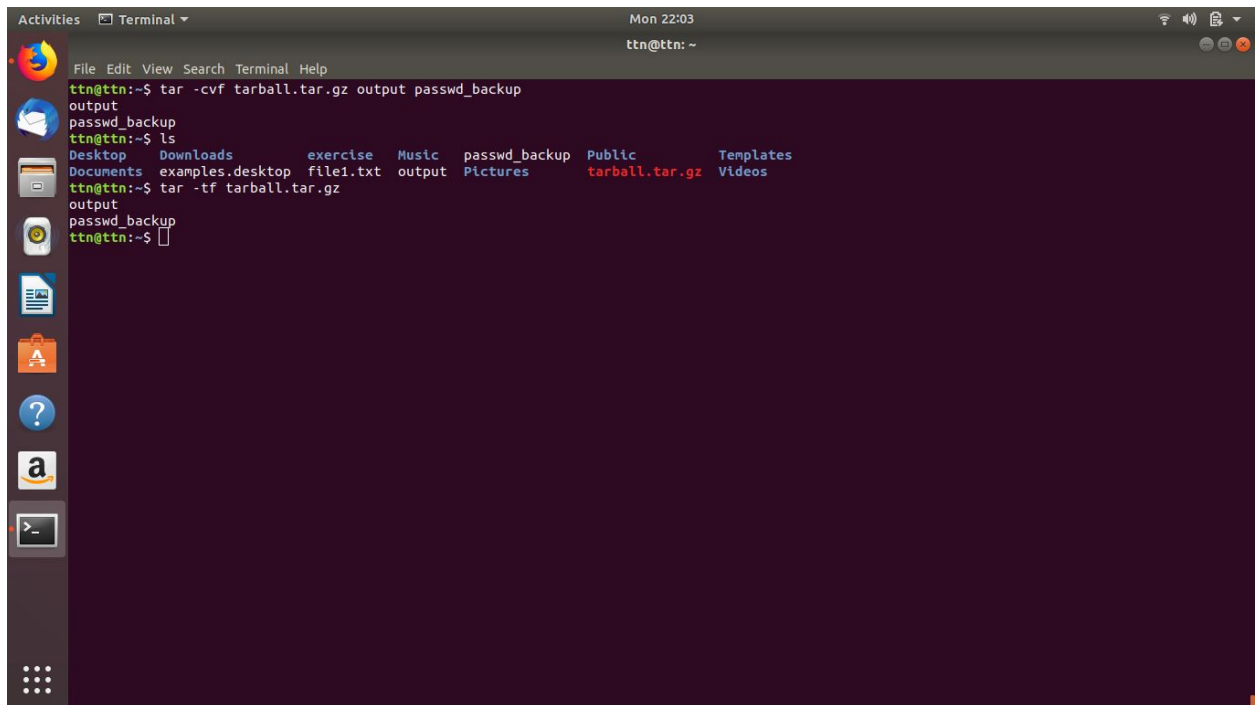
```
Use 'sudo apt autoremove' to remove them.
```

```
0 upgraded, 0 newly installed, 0 to remove and 56 not upgraded.
```

```
ttn@ttn:~$
```



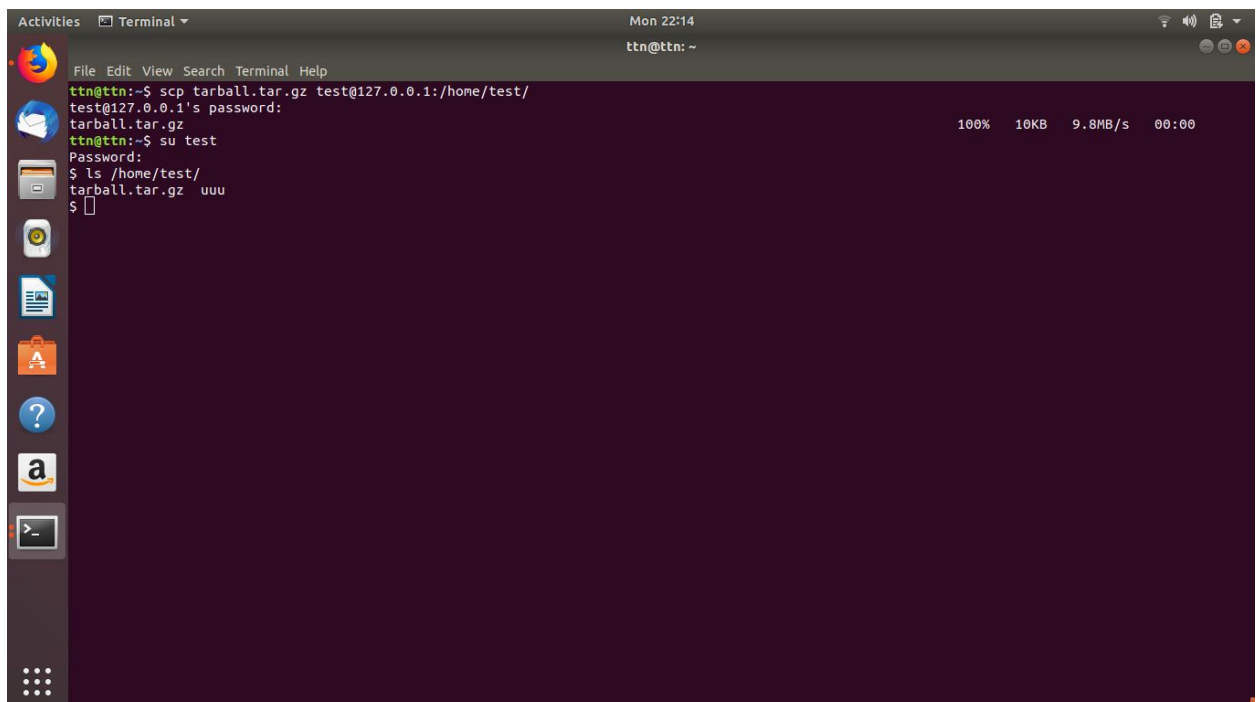
14. Compress "output" and "password\_backup" files into a tar ball. List the files present inside the tar created.



A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 22:03, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ tar -cvf tarball.tar.gz output passwd_backup
output
passwd_backup
ttn@ttn:~$ ls
Desktop  Downloads  exercise  Music  passwd_backup  Public  Templates
Documents  examples.desktop  file1.txt  output  Pictures  tarball.tar.gz  Videos
ttn@ttn:~$ tar -tf tarball.tar.gz
output
passwd_backup
ttn@ttn:~$
```

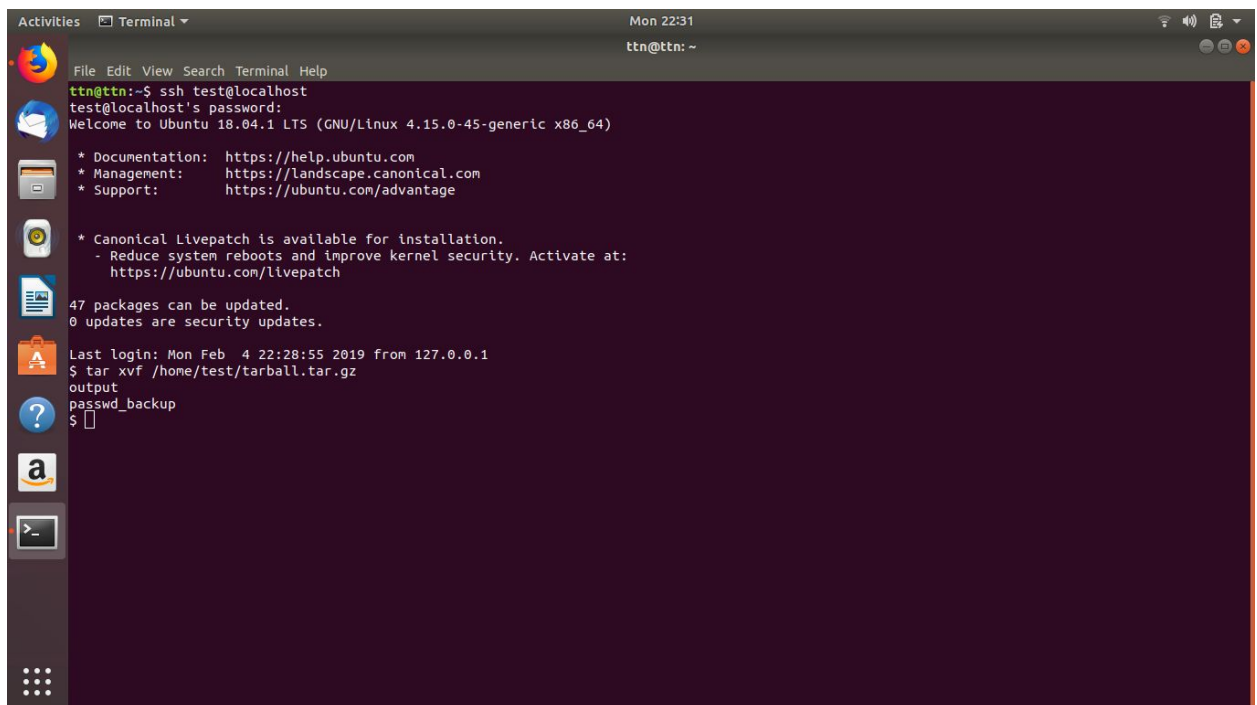
15. scp this file to test user



A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 22:14, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ scp tarball.tar.gz test@127.0.0.1:/home/test/
test@127.0.0.1's password:
tarball.tar.gz                                100% 10KB 9.8MB/s 00:00
ttn@ttn:~$ su test
Password:
$ ls /home/test/
tarball.tar.gz uu
$
```

## 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) and a status bar (Mon 22:31, ttn@ttn: ~). The terminal shows a user logging into a remote server 'test@localhost' via SSH. The password is entered, and the user is greeted with 'Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-45-generic x86\_64)'. System messages provide links for documentation, management, and support, and mention Canonical Livepatch. It also states that 47 packages can be updated, with 0 security updates. The last login is recorded as 'Mon Feb 4 22:28:55 2019 from 127.0.0.1'. The user then runs the command '\$ tar xvf /home/test/tarball.tar.gz', which outputs 'output' and 'passwd\_backup'.

```
File Edit View Search Terminal Help
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)

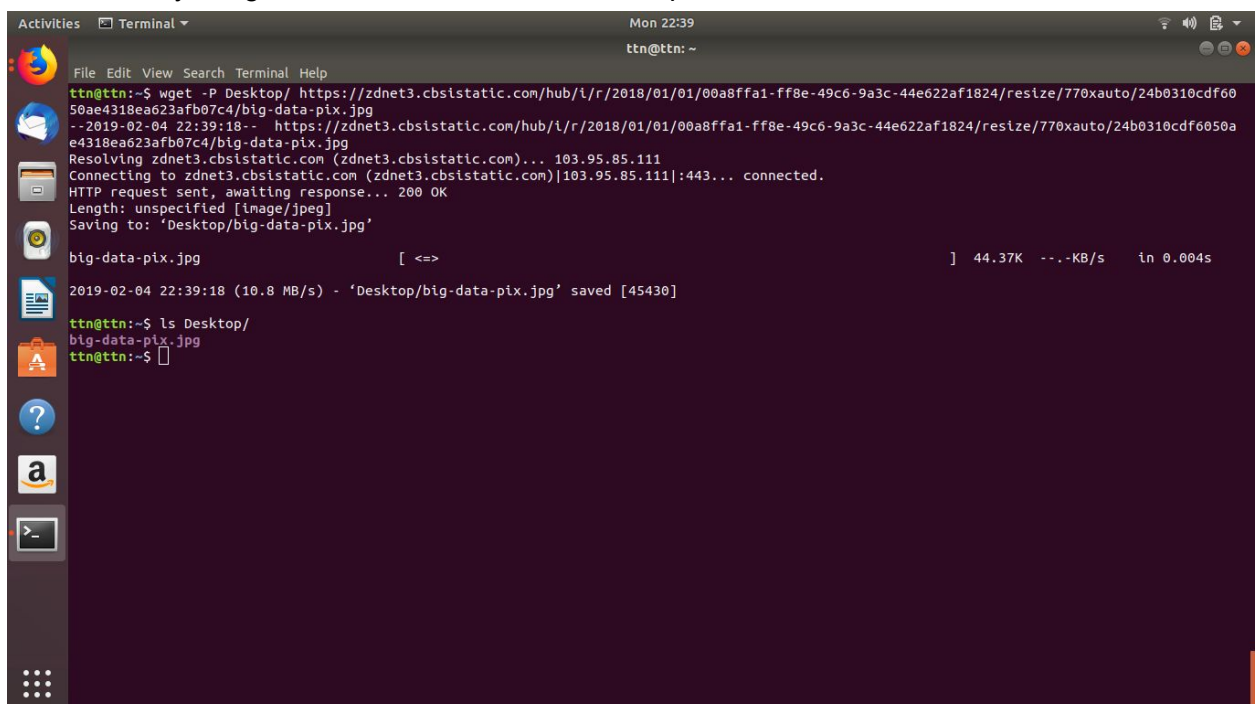
 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

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

47 packages can be updated.
0 updates are security updates.

Last login: Mon Feb 4 22:28:55 2019 from 127.0.0.1
$ tar xvf /home/test/tarball.tar.gz
output
passwd_backup
$
```

## 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) and a status bar (Mon 22:39, ttn@ttn: ~). The user runs the command '\$ wget -P Desktop/ https://zdnet3.cbsistatic.com/hub/l/r/2018/01/01/00a8ffa1-ff8e-49c6-9a3c-44e622af1824/resize/770xauto/24b0310cdf6050ae4318ea623afb07c4/big-data-pix.jpg'. The terminal shows the progress of the download, including the URL, the file size (44.37K), and the time taken (0.004s). The file is saved to 'Desktop/big-data-pix.jpg'. The user then runs '\$ ls Desktop/' and the output shows 'big-data-pix.jpg'.

```
File Edit View Search Terminal Help
ttn@ttn:~$ wget -P Desktop/ https://zdnet3.cbsistatic.com/hub/l/r/2018/01/01/00a8ffa1-ff8e-49c6-9a3c-44e622af1824/resize/770xauto/24b0310cdf6050ae4318ea623afb07c4/big-data-pix.jpg
--2019-02-04 22:39:18-- https://zdnet3.cbsistatic.com/hub/l/r/2018/01/01/00a8ffa1-ff8e-49c6-9a3c-44e622af1824/resize/770xauto/24b0310cdf6050ae4318ea623afb07c4/big-data-pix.jpg
Resolving zdnet3.cbsistatic.com (zdnet3.cbsistatic.com)... 103.95.85.111
Connecting to zdnet3.cbsistatic.com (zdnet3.cbsistatic.com)|103.95.85.111|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [image/jpeg]
Saving to: 'Desktop/big-data-pix.jpg'

big-data-pix.jpg [ <=> ] 44.37K --.-KB/s in 0.004s

2019-02-04 22:39:18 (10.8 MB/s) - 'Desktop/big-data-pix.jpg' saved [45430]

ttn@ttn:~$ ls Desktop/
big-data-pix.jpg
ttn@ttn:~$
```

## 18. How to get help of commands usages.

```
Activities Terminal Mon 22:40 ttn@ttn: ~
File Edit View Search Terminal Help
ttn@ttn:~$ ls --help
Usage: ls [OPTION]... [FILE]...
List information about the FILES (the current directory by default).
Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

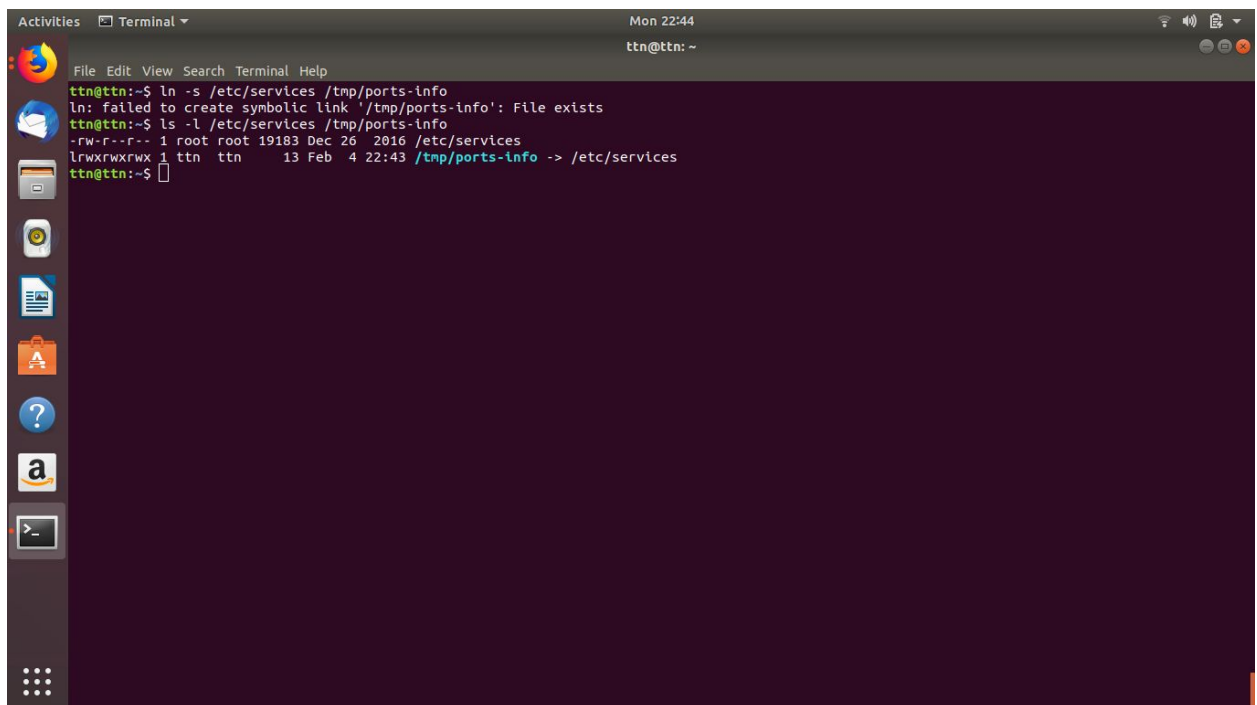
Mandatory arguments to long options are mandatory for short options too.
-a, --all do not ignore entries starting with .
-A, --almost-all do not list implied . and ..
--author with -l, print the author of each file
-b, --escape print C-style escapes for nongraphic characters
--block-size=SIZE scale sizes 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
--color[=WHEN] colorize the output; WHEN can be 'always' (default if omitted), 'auto', or 'never'; more info below
-d, --directory list directories themselves, not their contents
-D, --dired generate output designed for Emacs' dired mode
-f do not sort, enable -au, disable -ls --color
-F, --classify append indicator (one of */=>@|) to entries
--file-type likewise, except do not append '*'
--format=WORD across -x, commas -m, horizontal -x, long -l, single-column -i, verbose -l, vertical -C
--full-time like -l --time-style=full-iso
-g like -l, but do not list owner
--group-directories-first group directories before files; can be augmented with a --sort option, but any use of --sort=none (-U) disables grouping
-G, --no-group in a long listing, don't print group names
-h, --human-readable with -l and/or -s, print human readable sizes (e.g., 1K 234M 2G)
--si likewise, but use powers of 1000 not 1024
```

```
Activities Terminal Mon 22:40 ttn@ttn: ~
File Edit View Search Terminal Help
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.

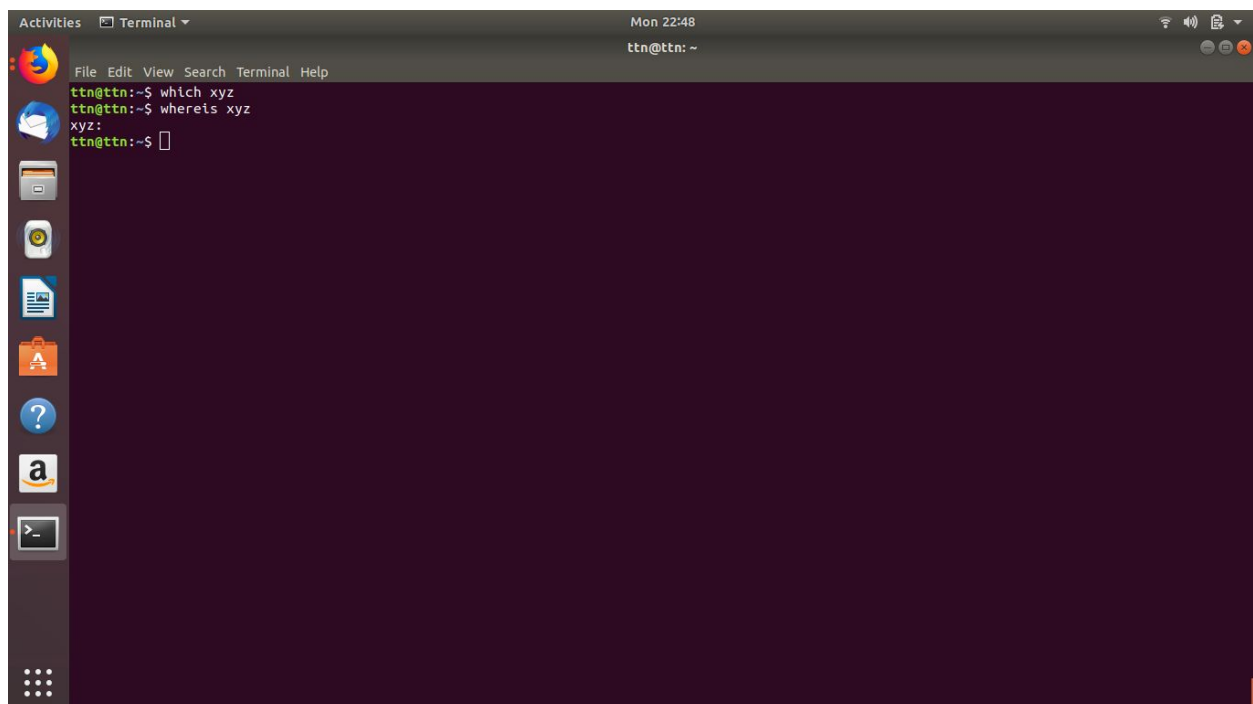
-a, --all do not ignore entries starting with .
-A, --almost-all do not list implied . and ..
--author with -l, print the author of each file
-b, --escape print C-style escapes for nongraphic characters
--block-size=SIZE scale sizes by SIZE before printing them; e.g., '--block-size=M' prints sizes in 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

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 22:44, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ ln -s /etc/services /tmp/ports-info
ln: failed to create symbolic link '/tmp/ports-info': File exists
ttn@ttn:~$ ls -l /etc/services /tmp/ports-info
-rw-r--r-- 1 root root 19183 Dec 26 2016 /etc/services
lrwxrwxrwx 1 ttn ttn 13 Feb 4 22:43 /tmp/ports-info -> /etc/services
ttn@ttn:~$
```

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?

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 22:48, ttn@ttn: ~). The terminal shows the following commands and output:

```
ttn@ttn:~$ which xyz
ttn@ttn:~$ whereis xyz
xyz:
ttn@ttn:~$
```