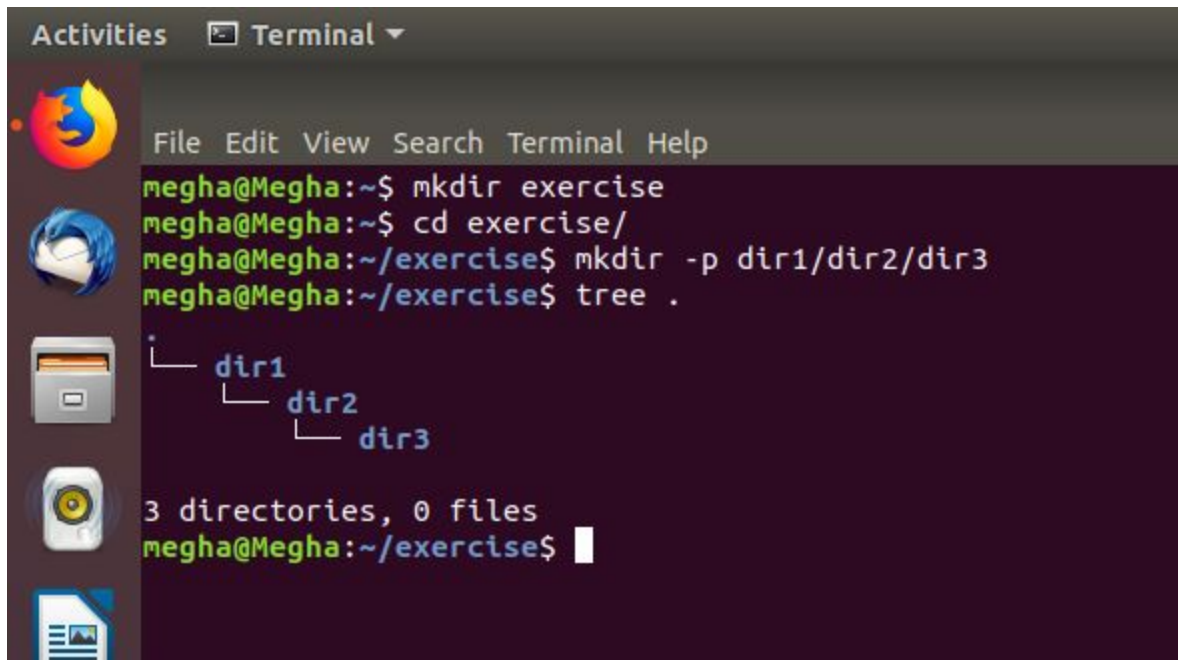
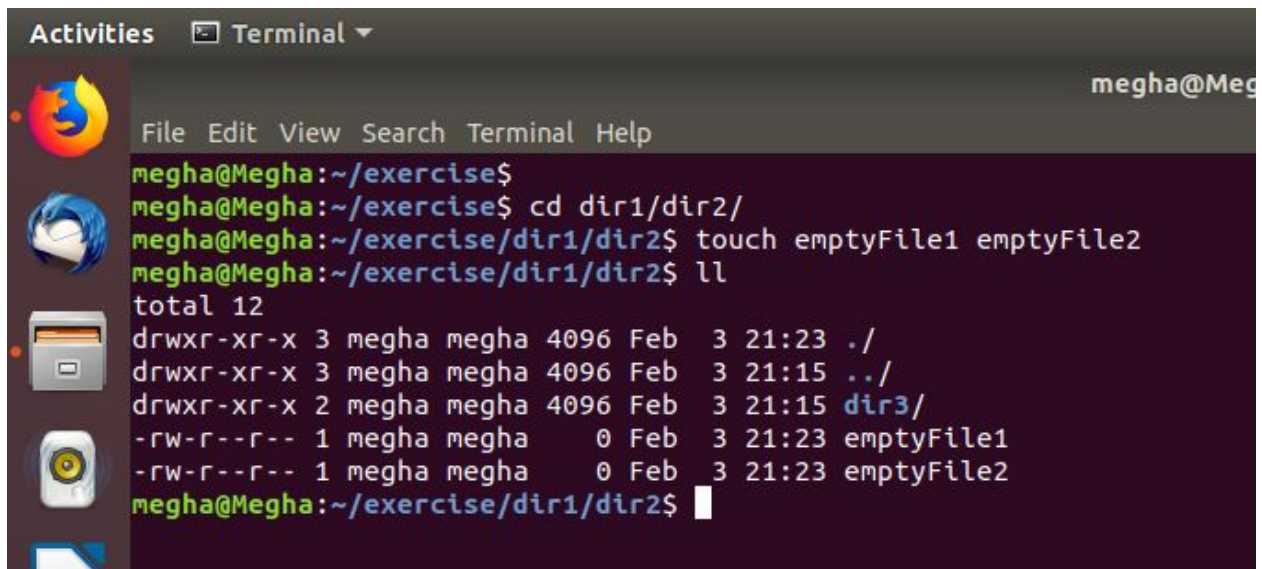


Question 1: Create a directory "exercise" inside your home directory and create nested(dir1/dir2/dir3) directory structure inside "exercise" with single command.

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help). The user 'megha' is at the prompt 'megha@Megha:~\$'. They execute 'mkdir exercise', then 'cd exercise/'. At the prompt 'megha@Megha:~/exercise\$', they execute 'mkdir -p dir1/dir2/dir3'. Then they execute 'tree .' which shows a tree structure: 'dir1' containing 'dir2', which contains 'dir3'. Below the tree, it says '3 directories, 0 files'. The prompt is now 'megha@Megha:~/exercise\$' with a cursor.

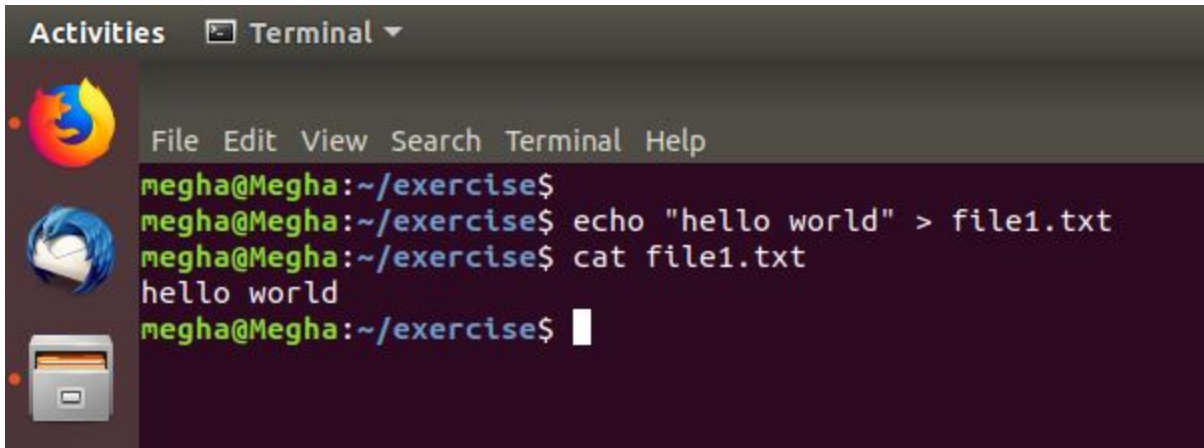
```
megha@Megha:~$ mkdir exercise
megha@Megha:~$ cd exercise/
megha@Megha:~/exercise$ mkdir -p dir1/dir2/dir3
megha@Megha:~/exercise$ tree .
.
├── dir1
│   └── dir2
│       └── dir3
└── 3 directories, 0 files
megha@Megha:~/exercise$
```

Question 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). The user 'megha' is at the prompt 'megha@Megha:~/exercise\$'. They execute 'cd dir1/dir2/'. At the prompt 'megha@Megha:~/exercise/dir1/dir2\$', they execute 'touch emptyFile1 emptyFile2'. Then they execute 'll' which shows the directory listing: 'total 12', 'drwxr-xr-x 3 megha megha 4096 Feb 3 21:23 ./', 'drwxr-xr-x 3 megha megha 4096 Feb 3 21:15 ../', 'drwxr-xr-x 2 megha megha 4096 Feb 3 21:15 dir3/', '-rw-r--r-- 1 megha megha 0 Feb 3 21:23 emptyFile1', and '-rw-r--r-- 1 megha megha 0 Feb 3 21:23 emptyFile2'. The prompt is now 'megha@Megha:~/exercise/dir1/dir2\$' with a cursor.

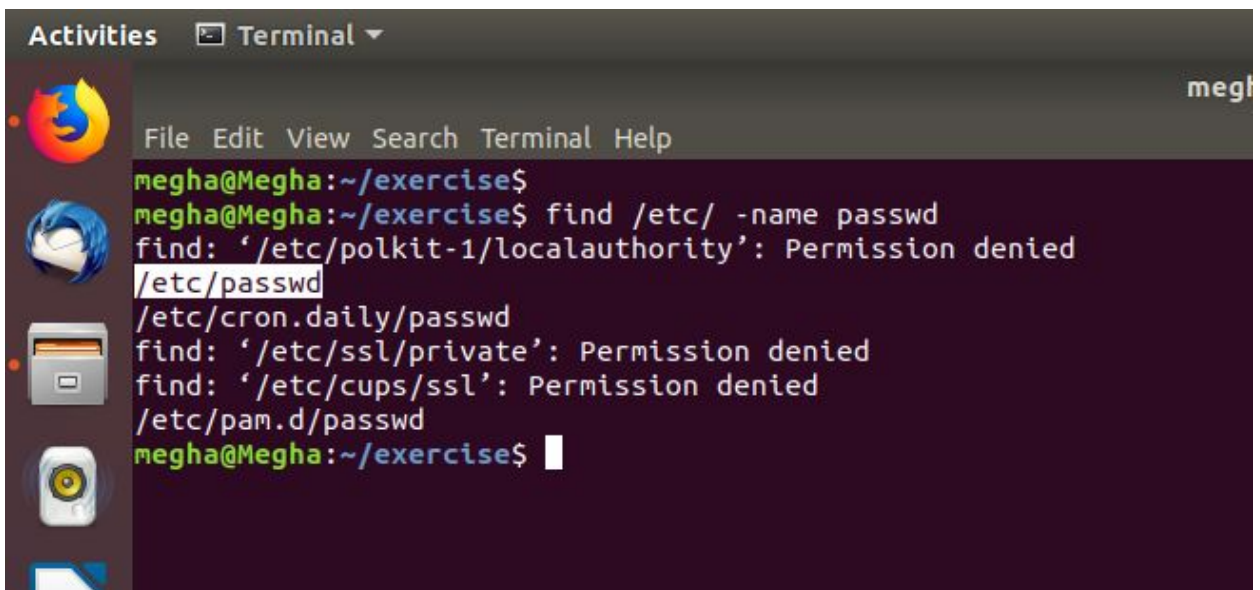
```
megha@Megha:~/exercise$
megha@Megha:~/exercise$ cd dir1/dir2/
megha@Megha:~/exercise/dir1/dir2$ touch emptyFile1 emptyFile2
megha@Megha:~/exercise/dir1/dir2$ ll
total 12
drwxr-xr-x 3 megha megha 4096 Feb 3 21:23 ./
drwxr-xr-x 3 megha megha 4096 Feb 3 21:15 ../
drwxr-xr-x 2 megha megha 4096 Feb 3 21:15 dir3/
-rw-r--r-- 1 megha megha 0 Feb 3 21:23 emptyFile1
-rw-r--r-- 1 megha megha 0 Feb 3 21:23 emptyFile2
megha@Megha:~/exercise/dir1/dir2$
```

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

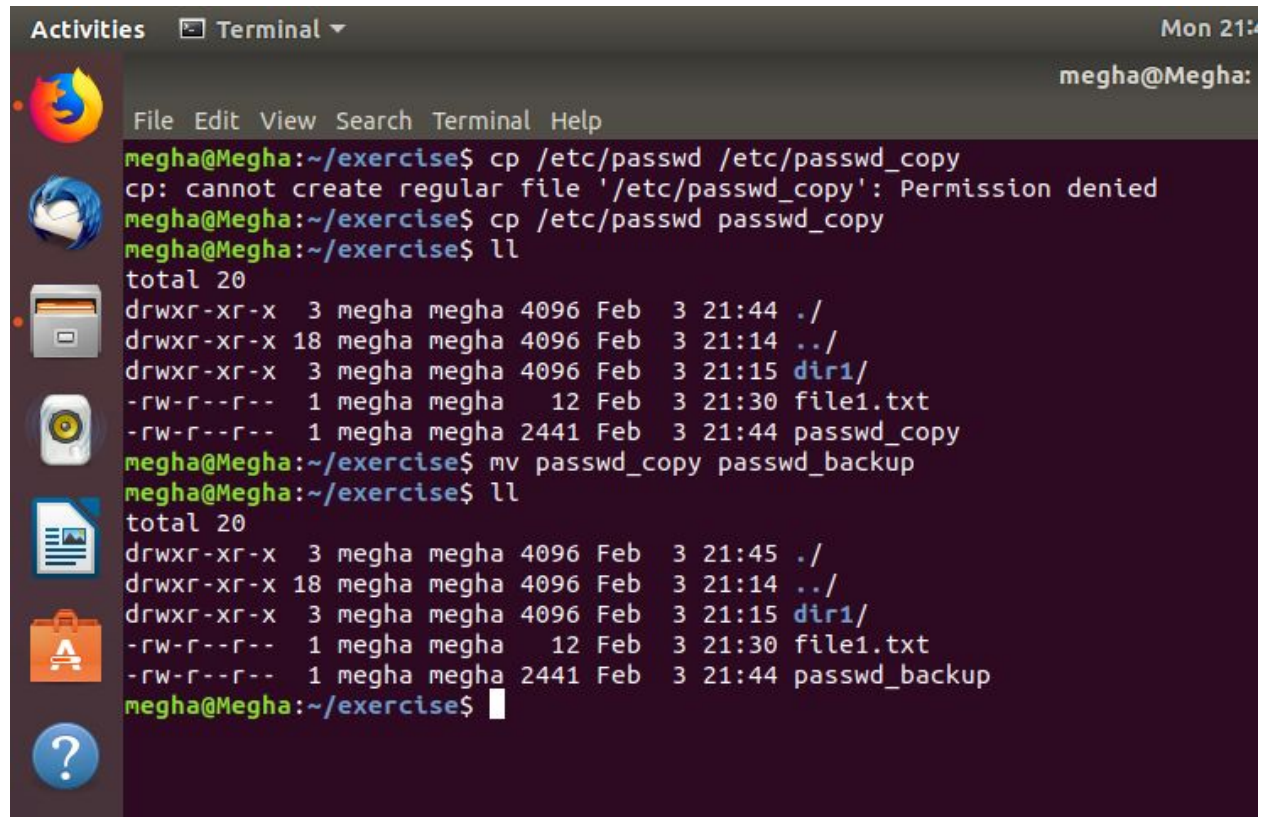
A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help). The user 'megha' is at the prompt 'megha@Megha:~/exercise\$'. They enter 'echo "hello world" > file1.txt', then 'cat file1.txt', which outputs 'hello world'. The prompt returns to 'megha@Megha:~/exercise\$'.

```
megha@Megha:~/exercise$  
megha@Megha:~/exercise$ echo "hello world" > file1.txt  
megha@Megha:~/exercise$ cat file1.txt  
hello world  
megha@Megha:~/exercise$
```

Question 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). The user 'megha' is at the prompt 'megha@Megha:~/exercise\$'. They enter 'find /etc/ -name passwd'. The output shows several paths with permission denied errors: '/etc/polkit-1/localauthority', '/etc/cron.daily/passwd', '/etc/ssl/private', and '/etc/cups/ssl'. The final path shown is '/etc/pam.d/passwd'. The prompt returns to 'megha@Megha:~/exercise\$'.

```
megha@Megha:~/exercise$  
megha@Megha:~/exercise$ find /etc/ -name passwd  
find: '/etc/polkit-1/localauthority': Permission denied  
/etc/passwd  
/etc/cron.daily/passwd  
find: '/etc/ssl/private': Permission denied  
find: '/etc/cups/ssl': Permission denied  
/etc/pam.d/passwd  
megha@Megha:~/exercise$
```



A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (Mon 21:4, megha@Megha:). The user is in the directory ~/exercise. The terminal shows the following commands and output:

```
megha@Megha:~/exercise$ cp /etc/passwd /etc/passwd_copy
cp: cannot create regular file '/etc/passwd_copy': Permission denied
megha@Megha:~/exercise$ cp /etc/passwd passwd_copy
megha@Megha:~/exercise$ ll
total 20
drwxr-xr-x  3 megha megha 4096 Feb  3 21:44 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 21:14 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha  12 Feb  3 21:30 file1.txt
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_copy
megha@Megha:~/exercise$ mv passwd_copy passwd_backup
megha@Megha:~/exercise$ ll
total 20
drwxr-xr-x  3 megha megha 4096 Feb  3 21:45 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 21:14 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha  12 Feb  3 21:30 file1.txt
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup
megha@Megha:~/exercise$
```

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

Commands -

\$ cat passwd_backup

Output: That display the text in a single line given with a period in a paragraph text


```
Activities Terminal Mon 21:49
megha@Megha: ~/exercise

File Edit View Search Terminal Help

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:Mail 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/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
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
uidd:x:105:111:./run/uidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
whoopsie:x:112:117:./nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:114:119:./var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
geoclue:x:119:124:./var/lib/geoclue:/usr/sbin/nologin
gnome-initial-setup:x:120:65534:./run/gnome-initial-setup:/bin/false
gdm:x:121:125:Gnome Display Manager:/var/lib/gdm3:/bin/false
megha:x:1000:1000:Megha,,,:/home/megha:/bin/bash
test:x:1001:1001:./home/test:/bin/sh
megha@Megha:~/exercise$
```

\$ less passwd_backup

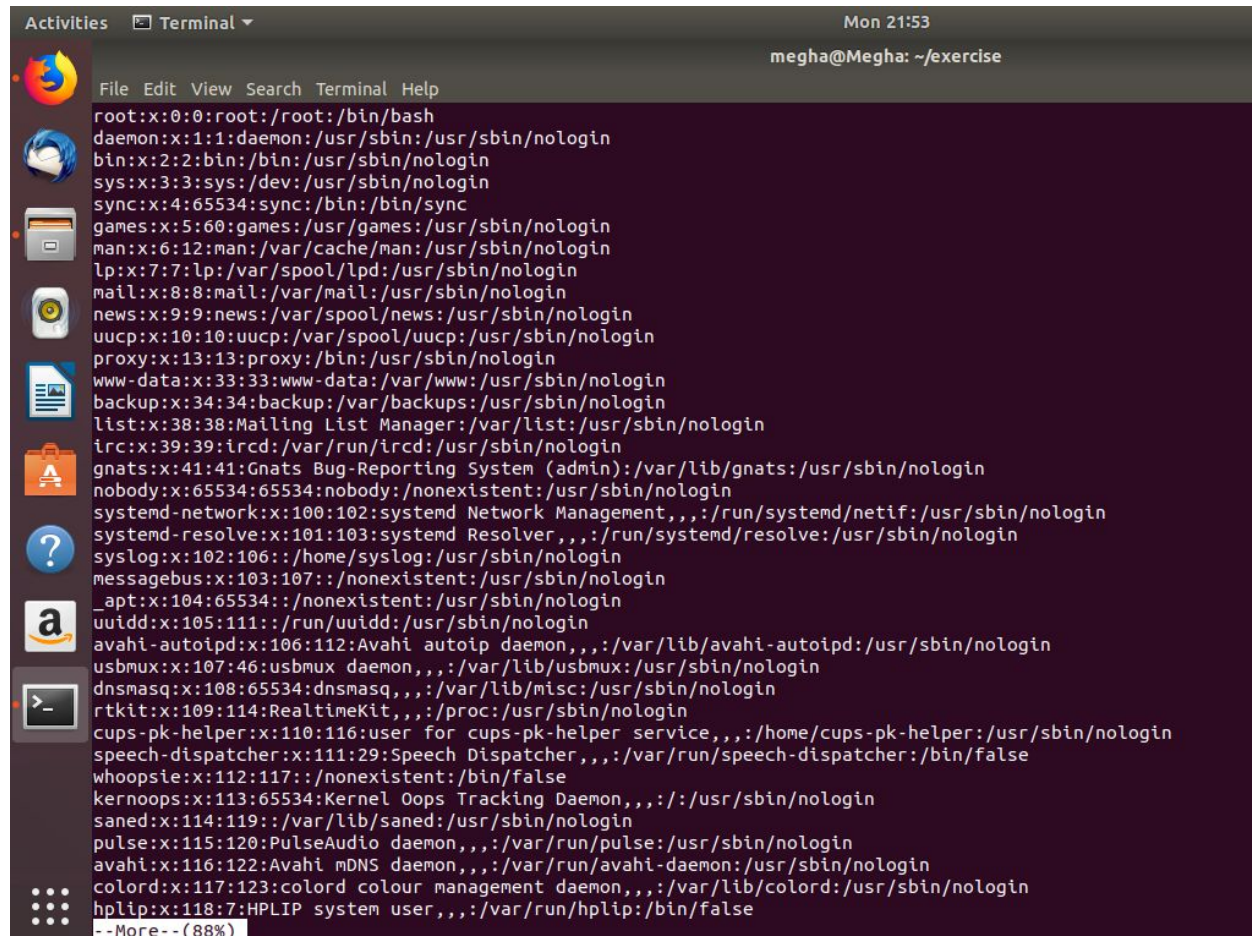
```
Activities Terminal Mon 21:50
megha@Megha: ~/exercise

File Edit View Search Terminal Help

root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/usr/sbin:/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:Mail 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/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
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
uidd:x:105:111:./run/uidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
whoopsie:x:112:117:./nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:114:119:./var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
passwd_backup
```

We have to press q to exit from less
We can go up and down in the file with arrow keys.

\$ more passwd_backup



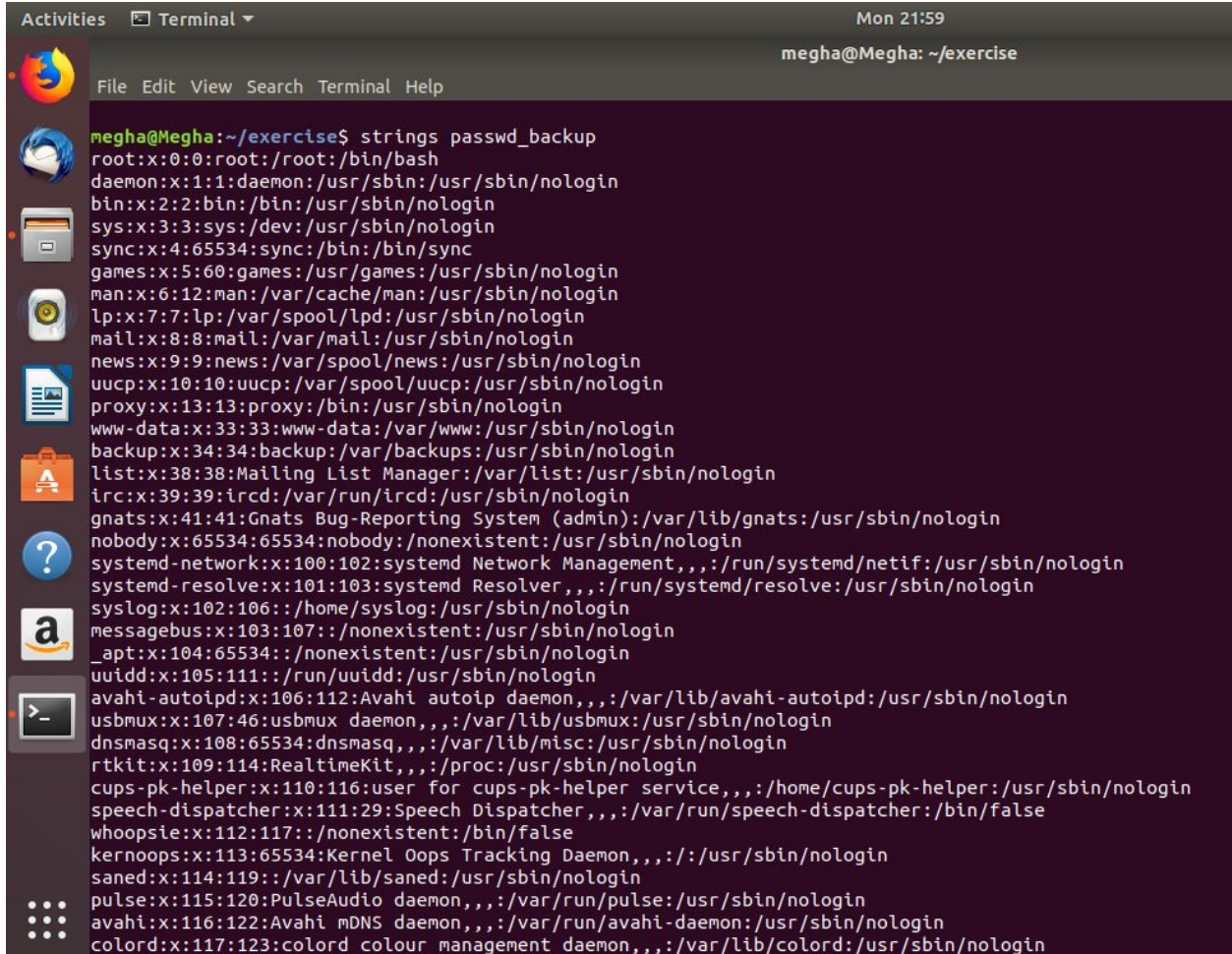
```
Activities  Terminal  Mon 21:53
megha@Megha: ~/exercise

File Edit View Search Terminal Help
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:Mail 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/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
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
uuidd:x:105:111:/:/run/uuidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
whoopsie:x:112:117:/:/nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:114:119:/:/var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
--More-- (88%)
```

It shows the file and we can go downwards by using enter till the end of the file.
We need to press q to exit if we want to exit in between or in end of the file it will automatically exit.


```
$ strings passwd_backup
```

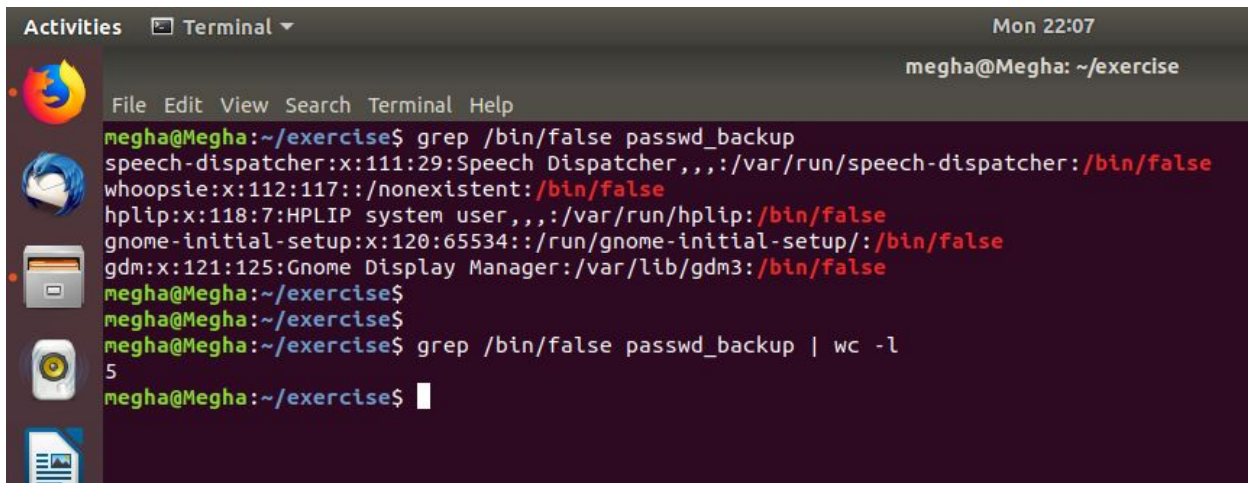
That display the text line by line after a period.



```
megha@Megha: ~/exercise
File Edit View Search Terminal Help

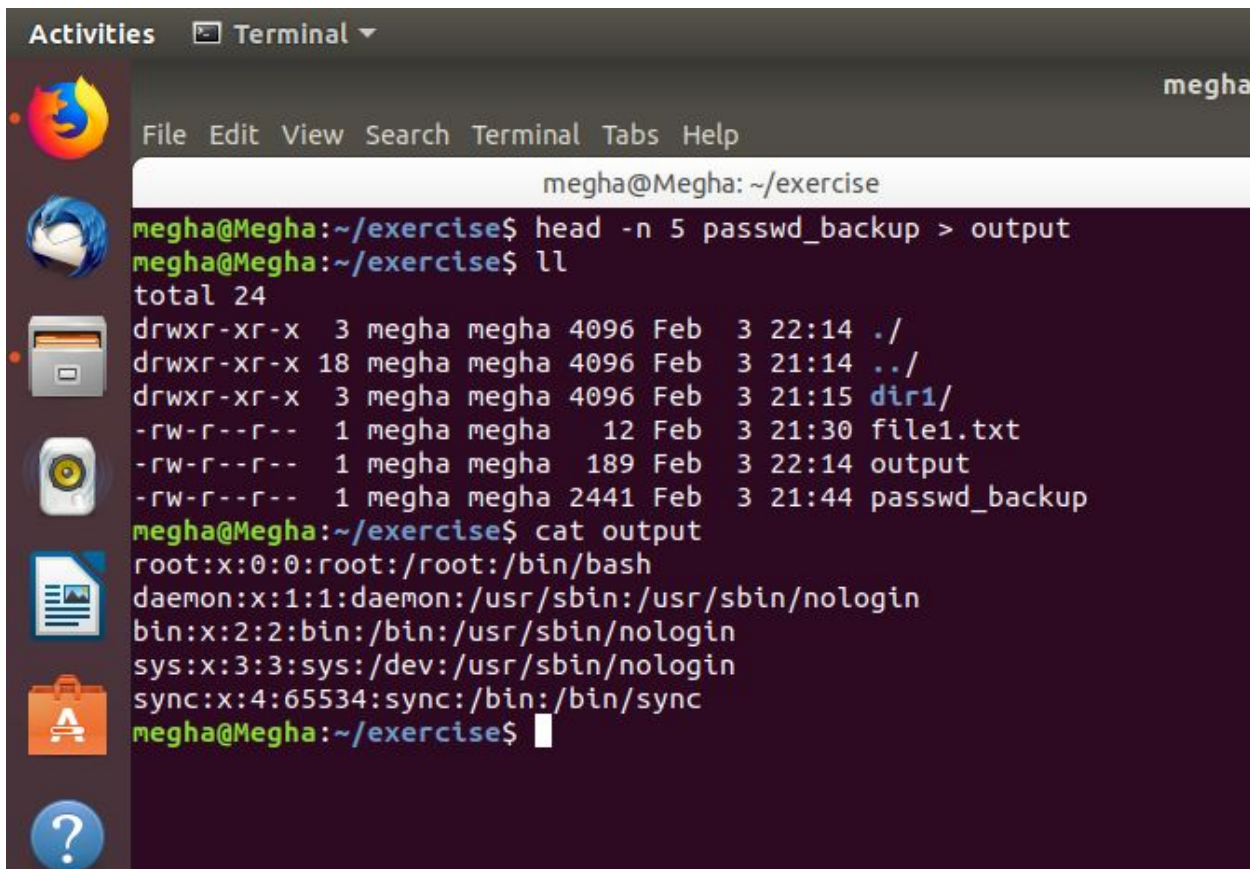
megha@Megha:~/exercise$ strings passwd_backup
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
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/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
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
uidd:x:105:111:/:/run/uidd:/usr/sbin/nologin
avahi-autoipd:x:106:112:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:107:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:108:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
rtkit:x:109:114:RealtimeKit,,,:/proc:/usr/sbin/nologin
cups-pk-helper:x:110:116:user for cups-pk-helper service,,,:/home/cups-pk-helper:/usr/sbin/nologin
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
whoopsie:x:112:117:/:/nonexistent:/bin/false
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:114:119:/:/var/lib/saned:/usr/sbin/nologin
pulse:x:115:120:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
avahi:x:116:122:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
colord:x:117:123:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
```

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

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar (megha@Megha: ~/exercise). The terminal shows the command 'grep /bin/false passwd_backup' being executed, which outputs five lines of system user information, each ending with '/bin/false'. The second command 'grep /bin/false passwd_backup | wc -l' is then executed, outputting the number '5'.

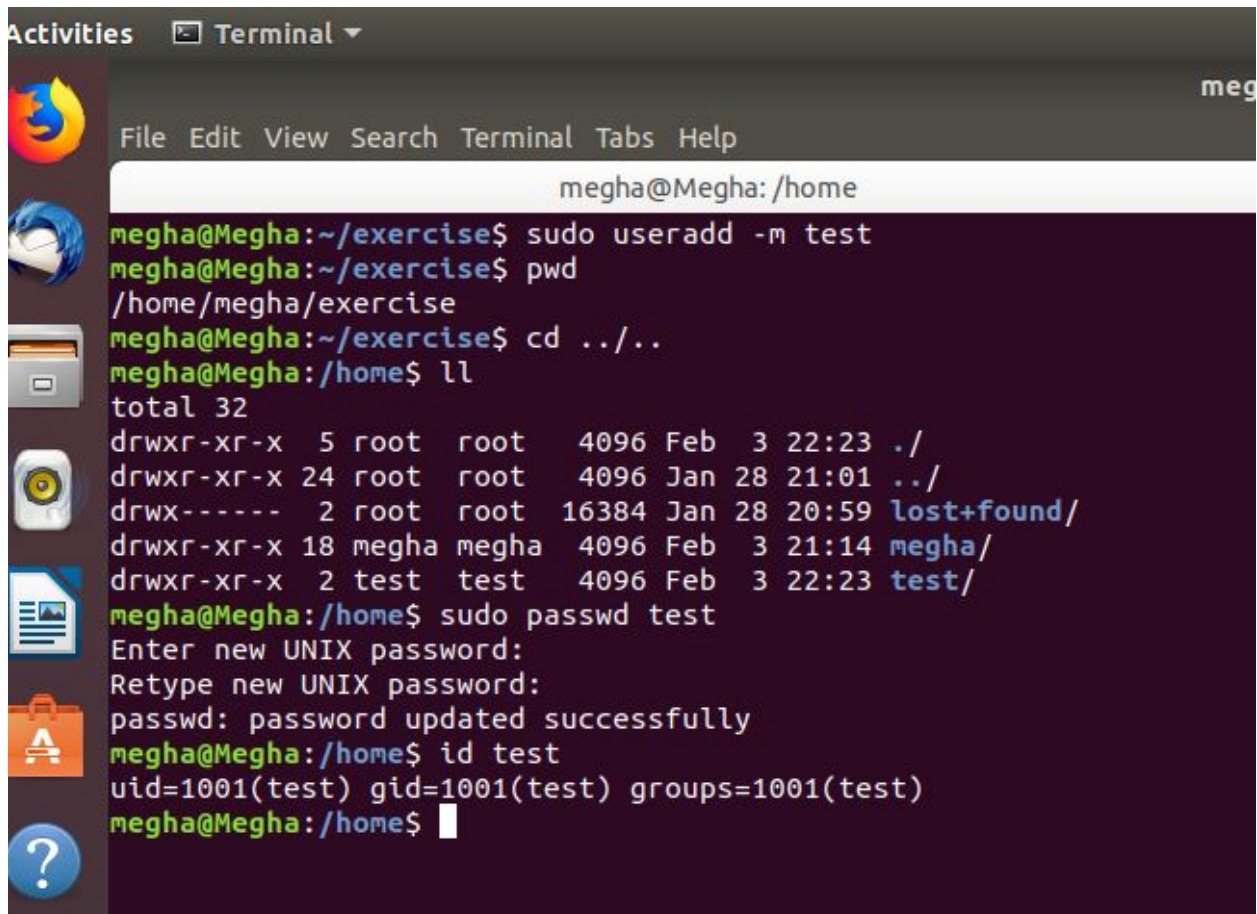
```
megha@Megha:~/exercise$ grep /bin/false passwd_backup
speech-dispatcher:x:111:29:Speech Dispatcher,,,:/var/run/speech-dispatcher:/bin/false
whoopsie:x:112:117::/nonexistent:/bin/false
hplip:x:118:7:HPLIP system user,,,:/var/run/hplip:/bin/false
gnome-initial-setup:x:120:65534::/run/gnome-initial-setup:/bin/false
gdm:x:121:125:Gnome Display Manager:/var/lib/gdm3:/bin/false
megha@Megha:~/exercise$
megha@Megha:~/exercise$ grep /bin/false passwd_backup | wc -l
5
megha@Megha:~/exercise$
```

Question 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, Tabs, Help) and a status bar (megha@Megha: ~/exercise). The terminal shows the command 'head -n 5 passwd_backup > output' being executed. The second command 'll' is then executed, showing the directory listing of the current directory, which includes the 'output' file. The third command 'cat output' is then executed, displaying the first five lines of the 'passwd_backup' file.

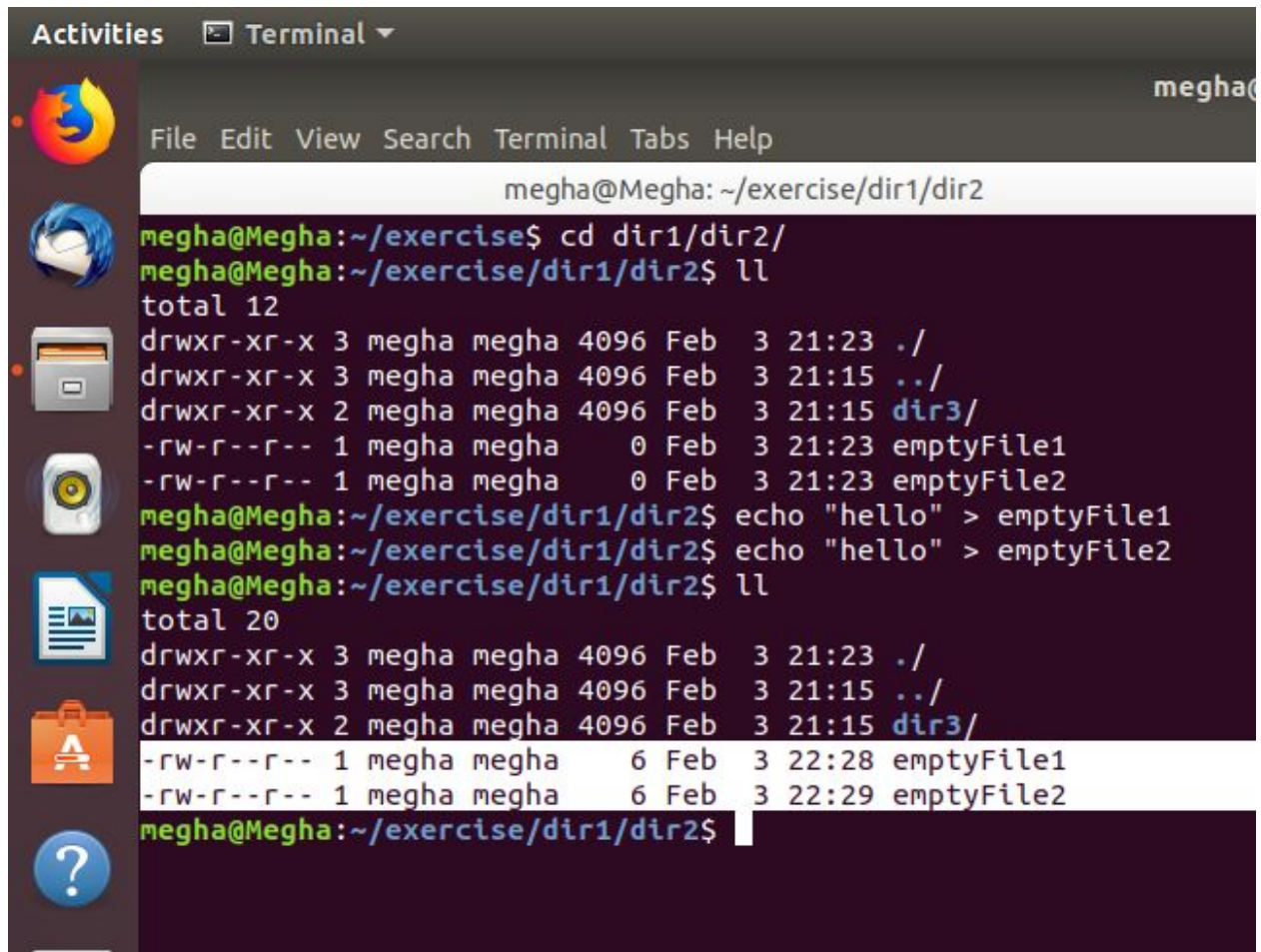
```
megha@Megha:~/exercise$ head -n 5 passwd_backup > output
megha@Megha:~/exercise$ ll
total 24
drwxr-xr-x  3 megha megha 4096 Feb  3 22:14 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 21:14 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha   12 Feb  3 21:30 file1.txt
-rw-r--r--  1 megha megha  189 Feb  3 22:14 output
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup
megha@Megha:~/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
megha@Megha:~/exercise$
```

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

A terminal window titled 'Terminal' is shown. The user 'megha' is logged in at 'Megha' with the current directory being '/home'. The user navigates to '/home/megha/exercise' and then back to '/home'. They run 'll' to list files, showing a directory 'test' owned by 'test' with UID 1001 and GID 1001. Then, they run 'sudo useradd -m test' to create the user. Next, they run 'sudo passwd test' to set a password, which is successful. Finally, they run 'id test' to verify the user's details, showing 'uid=1001(test) gid=1001(test) groups=1001(test)'.

```
megha@Megha: /home
megha@Megha:~/exercise$ sudo useradd -m test
megha@Megha:~/exercise$ pwd
/home/megha/exercise
megha@Megha:~/exercise$ cd ../../
megha@Megha:/home$ ll
total 32
drwxr-xr-x  5 root  root   4096 Feb  3 22:23 ./
drwxr-xr-x 24 root  root   4096 Jan 28 21:01 ../
drwx-----  2 root  root  16384 Jan 28 20:59 lost+found/
drwxr-xr-x 18 megha megha  4096 Feb  3 21:14 megha/
drwxr-xr-x  2 test  test   4096 Feb  3 22:23 test/
megha@Megha:/home$ sudo passwd test
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
megha@Megha:/home$ id test
uid=1001(test) gid=1001(test) groups=1001(test)
megha@Megha:/home$
```


Question 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, Tabs, Help) and a user 'megha' in the top right. The terminal shows a sequence of commands and their outputs. The user navigates to ~/exercise/dir1/dir2 and lists files. Two empty files, emptyFile1 and emptyFile2, are shown with timestamps of 21:23. The user then uses 'echo "hello" > emptyFile1' and 'echo "hello" > emptyFile2' to create content. Finally, the user lists the files again, showing that the timestamps have been updated to 22:28 and 22:29 respectively.

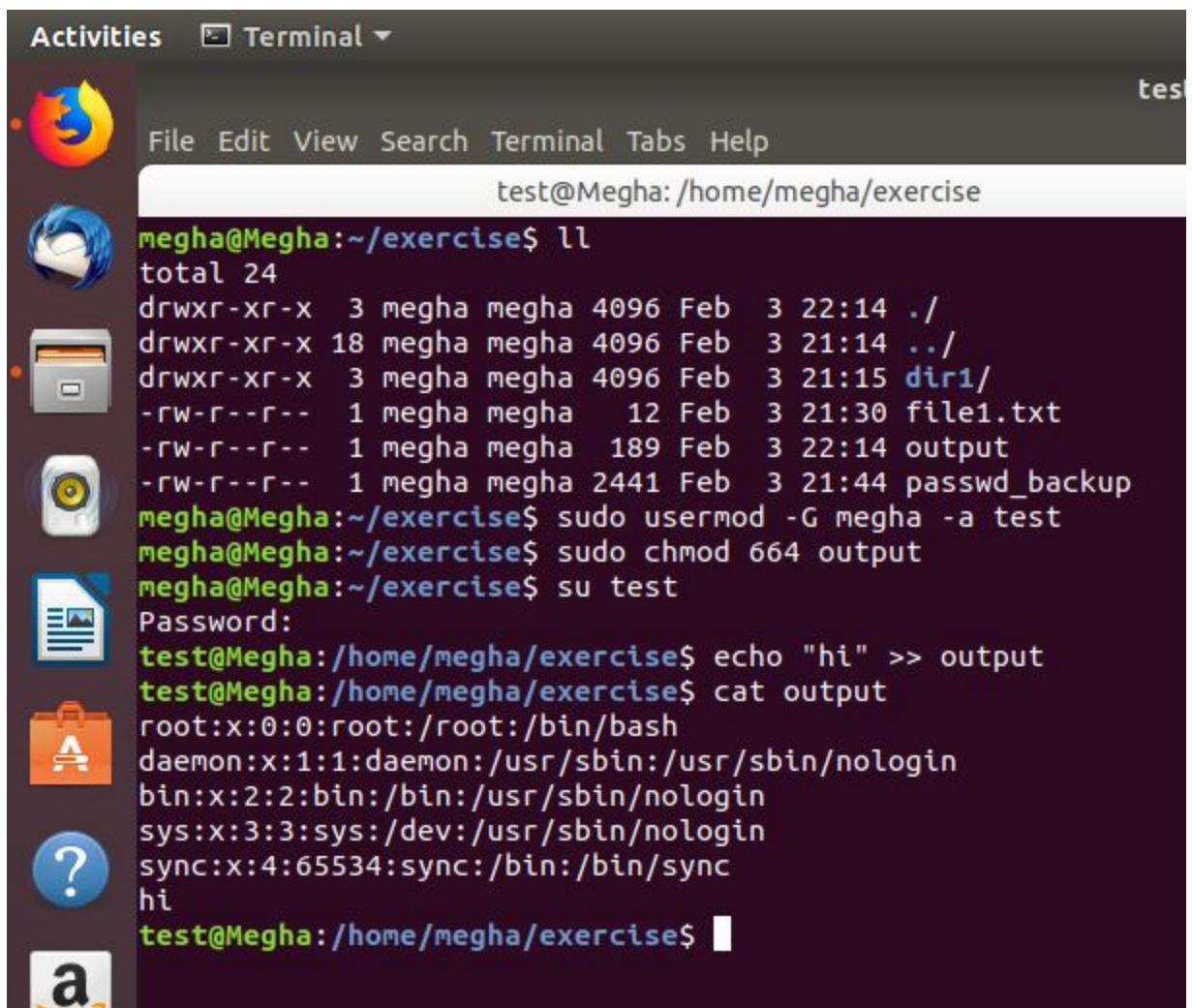
```
megha@Megha: ~/exercise/dir1/dir2
megha@Megha:~/exercise$ cd dir1/dir2/
megha@Megha:~/exercise/dir1/dir2$ ll
total 12
drwxr-xr-x 3 megha megha 4096 Feb  3 21:23 ./
drwxr-xr-x 3 megha megha 4096 Feb  3 21:15 ../
drwxr-xr-x 2 megha megha 4096 Feb  3 21:15 dir3/
-rw-r--r-- 1 megha megha    0 Feb  3 21:23 emptyFile1
-rw-r--r-- 1 megha megha    0 Feb  3 21:23 emptyFile2
megha@Megha:~/exercise/dir1/dir2$ echo "hello" > emptyFile1
megha@Megha:~/exercise/dir1/dir2$ echo "hello" > emptyFile2
megha@Megha:~/exercise/dir1/dir2$ ll
total 20
drwxr-xr-x 3 megha megha 4096 Feb  3 21:23 ./
drwxr-xr-x 3 megha megha 4096 Feb  3 21:15 ../
drwxr-xr-x 2 megha megha 4096 Feb  3 21:15 dir3/
-rw-r--r-- 1 megha megha    6 Feb  3 22:28 emptyFile1
-rw-r--r-- 1 megha megha    6 Feb  3 22:29 emptyFile2
megha@Megha:~/exercise/dir1/dir2$
```

Question 10:

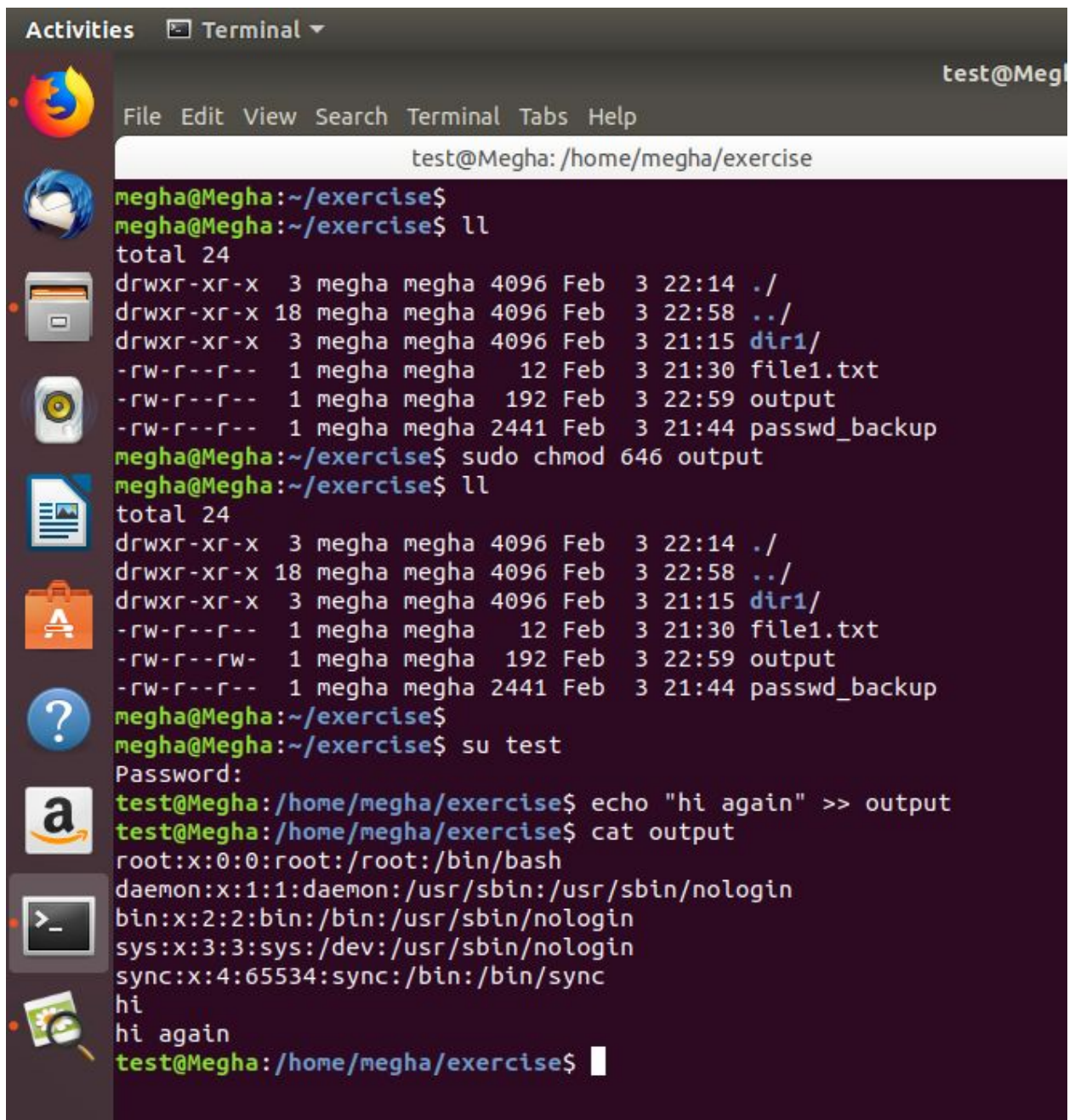
Login as test user and edit the "output" file created above. Since the permission wont allow you to save the changes. Configure such that test user can edit it.

\$ su test

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

A terminal window titled 'Terminal' with a menu bar (File, Edit, View, Search, Terminal, Tabs, Help) and a title bar showing 'test@Megha: /home/megha/exercise'. The terminal shows a user 'megha' at 'Megha' in the directory '~/exercise'. They run 'll' to list files: total 24, drwxr-xr-x 3 megha megha 4096 Feb 3 22:14 ./, drwxr-xr-x 18 megha megha 4096 Feb 3 21:14 ../, drwxr-xr-x 3 megha megha 4096 Feb 3 21:15 dir1/, -rw-r--r-- 1 megha megha 12 Feb 3 21:30 file1.txt, -rw-r--r-- 1 megha megha 189 Feb 3 22:14 output, -rw-r--r-- 1 megha megha 2441 Feb 3 21:44 passwd_backup. Then they run 'sudo usermod -G megha -a test', 'sudo chmod 664 output', and 'su test'. A password prompt is shown. Then they run 'echo "hi" >> output' and 'cat output', which shows the user list (root, daemon, bin, sys, sync) and 'hi'. The prompt returns to 'test@Megha: /home/megha/exercise\$'.

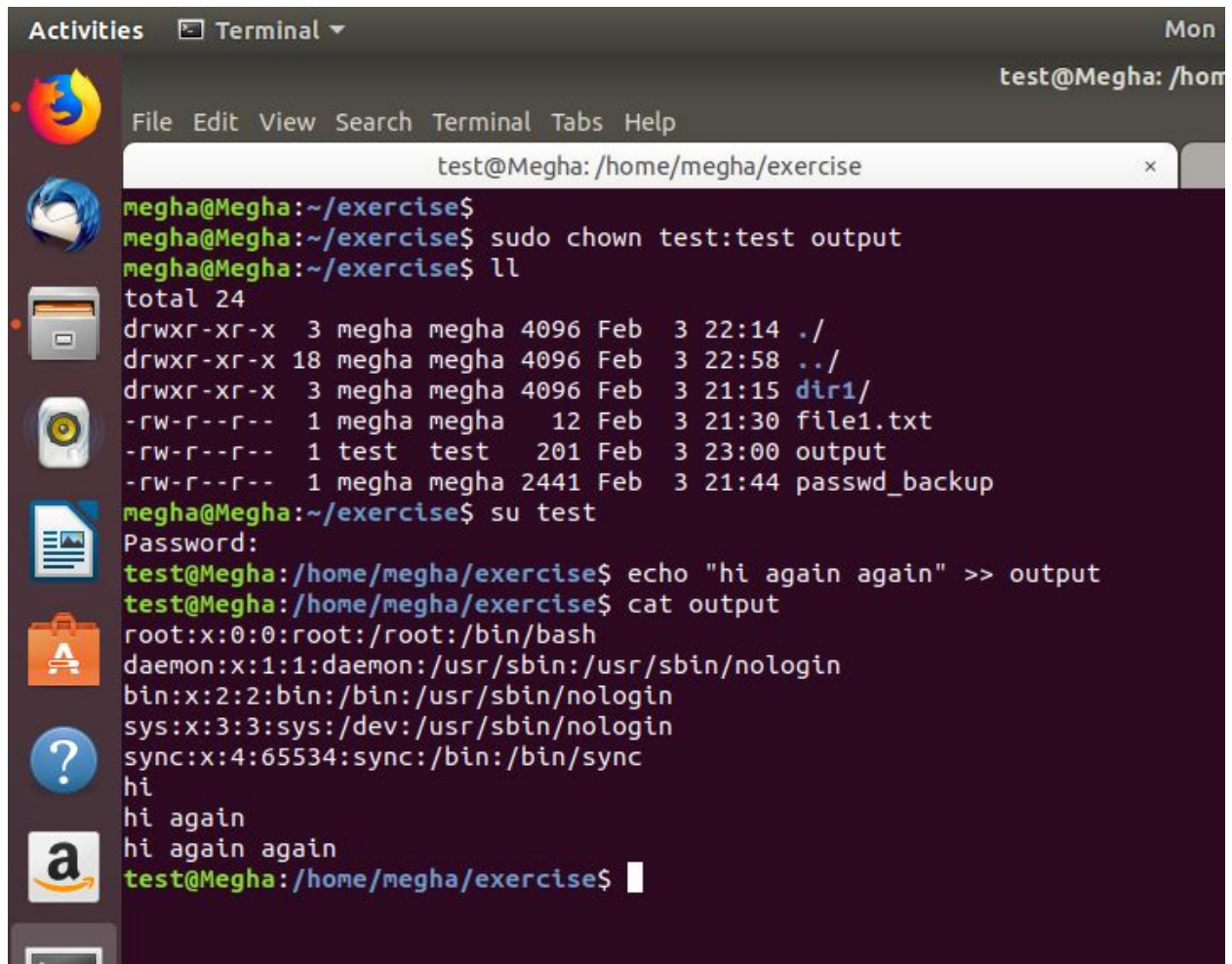
2. Make the file editable to the world so that test user can access it. Revert the changes after verification



The image shows a terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Tabs, Help) and a user indicator "test@Megha". The terminal session is performed by the user "megha" in the directory "/home/megha/exercise".

```
megha@Megha:~/exercise$ ll
total 24
drwxr-xr-x  3 megha megha 4096 Feb  3 22:14 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 22:58 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha   12 Feb  3 21:30 file1.txt
-rw-r--r--  1 megha megha  192 Feb  3 22:59 output
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup
megha@Megha:~/exercise$ sudo chmod 646 output
megha@Megha:~/exercise$ ll
total 24
drwxr-xr-x  3 megha megha 4096 Feb  3 22:14 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 22:58 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha   12 Feb  3 21:30 file1.txt
-rw-r--r--  1 megha megha  192 Feb  3 22:59 output
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup
megha@Megha:~/exercise$ su test
Password:
test@Megha:/home/megha/exercise$ echo "hi again" >> output
test@Megha:/home/megha/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
hi
hi again
test@Megha:/home/megha/exercise$
```


3. Change the ownership to edit the file.



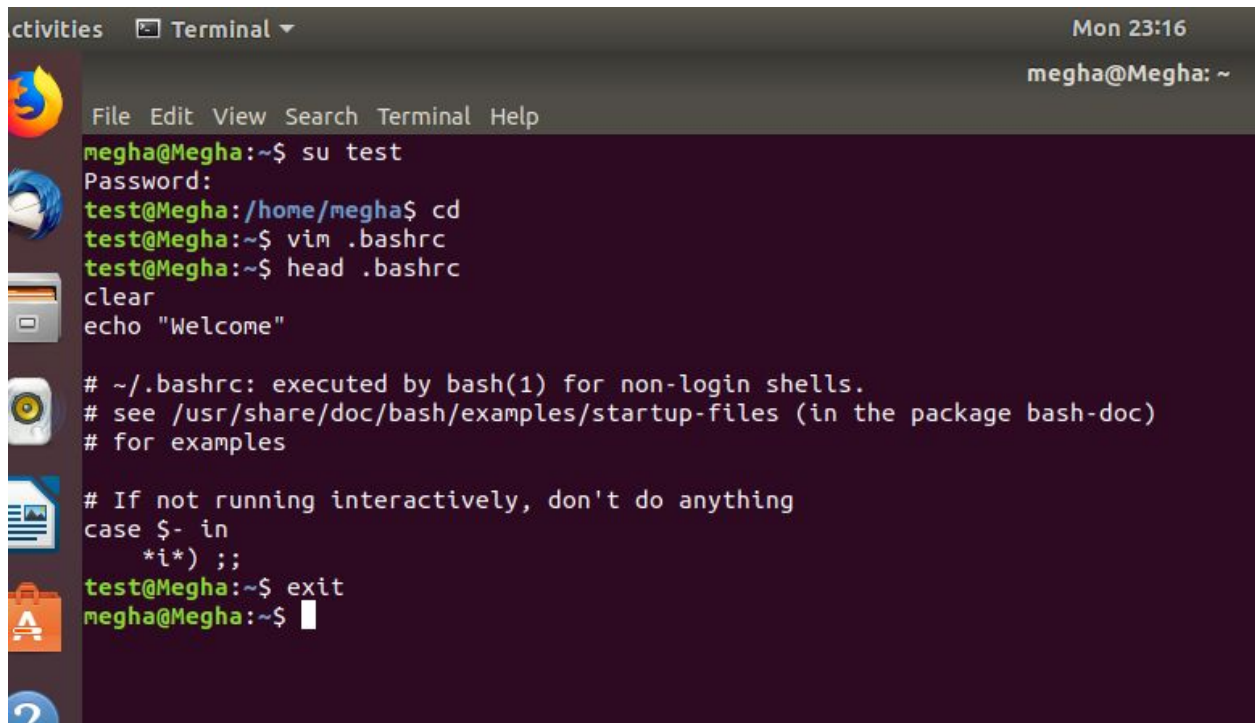
The image shows a Linux terminal window with a dark background. The window title is "Terminal" and the user is "test@Megha". The terminal shows the following commands and output:

```
megha@Megha:~/exercise$  
megha@Megha:~/exercise$ sudo chown test:test output  
megha@Megha:~/exercise$ ll  
total 24  
drwxr-xr-x  3 megha megha 4096 Feb  3 22:14 ./  
drwxr-xr-x 18 megha megha 4096 Feb  3 22:58 ../  
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/  
-rw-r--r--  1 megha megha   12 Feb  3 21:30 file1.txt  
-rw-r--r--  1 test  test   201 Feb  3 23:00 output  
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup  
megha@Megha:~/exercise$ su test  
Password:  
test@Megha:/home/megha/exercise$ echo "hi again again" >> output  
test@Megha:/home/megha/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  
hi  
hi again  
hi again again  
test@Megha:/home/megha/exercise$
```

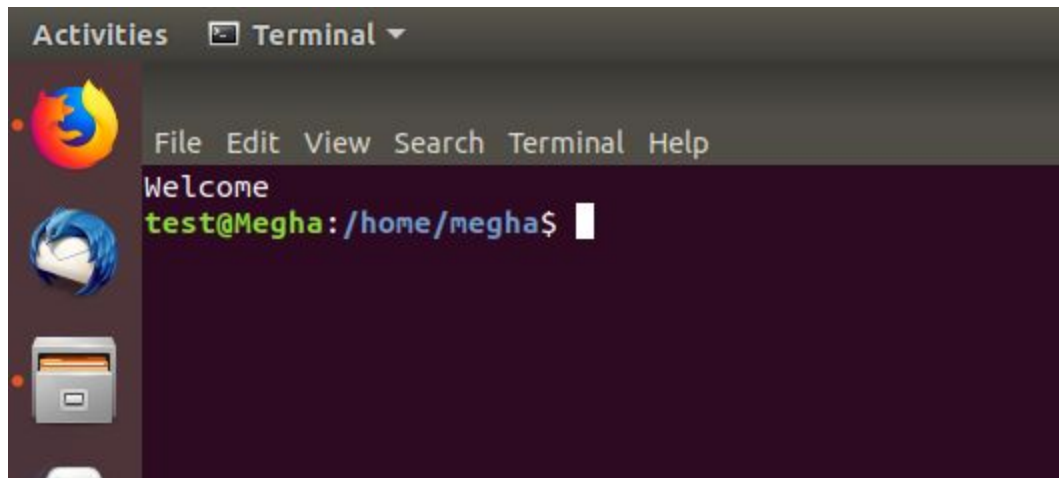
Question 11: Create alias with your name so that it creates a file as "/tmp/aliastesting"

```
megha@Megha: ~/exercise
File Edit View Search Terminal Tabs Help
megha@Megha: ~/exercise
megha@Megha:~/exercise$ alias megha='touch /tmp/aliastesting'
megha@Megha:~/exercise$ megha
megha@Megha:~/exercise$ ls /tmp/
aliastesting
config-err-rdKKE
ssh-QdZjRsCPFLRa
systemd-private-b1d9bdaed9674316a806aba816a11e23-bolt.service-8cXaMg
systemd-private-b1d9bdaed9674316a806aba816a11e23-colord.service-kz0y3P
systemd-private-b1d9bdaed9674316a806aba816a11e23-fwupd.service-iAVdkq
systemd-private-b1d9bdaed9674316a806aba816a11e23-rtkit-daemon.service-2TtYCb
systemd-private-b1d9bdaed9674316a806aba816a11e23-systemd-resolved.service-u9Nhkf
systemd-private-b1d9bdaed9674316a806aba816a11e23-systemd-timesyncd.service-km6uLN
Temp-6fae1c1d-ea23-4577-8587-1811102de09a
megha@Megha:~/exercise$
```

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

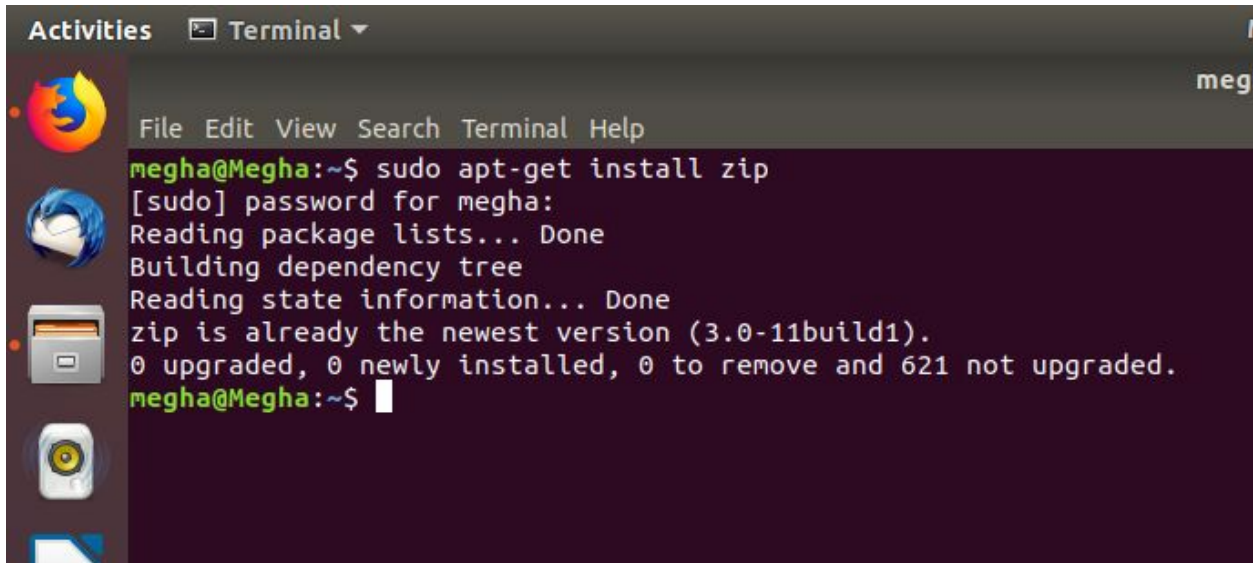


```
activities  Terminal  Mon 23:16  megha@Megha: ~  
File Edit View Search Terminal Help  
megha@Megha:~$ su test  
Password:  
test@Megha:/home/megha$ cd  
test@Megha:~$ vim .bashrc  
test@Megha:~$ head .bashrc  
clear  
echo "Welcome"  
  
# ~/.bashrc: executed by bash(1) for non-login shells.  
# see /usr/share/doc/bash/examples/startup-files (in the package bash-doc)  
# for examples  
  
# If not running interactively, don't do anything  
case $- in  
  *(*) ;;  
test@Megha:~$ exit  
megha@Megha:~$
```



```
Activities  Terminal  
File Edit View Search Terminal Help  
Welcome  
test@Megha:/home/megha$
```

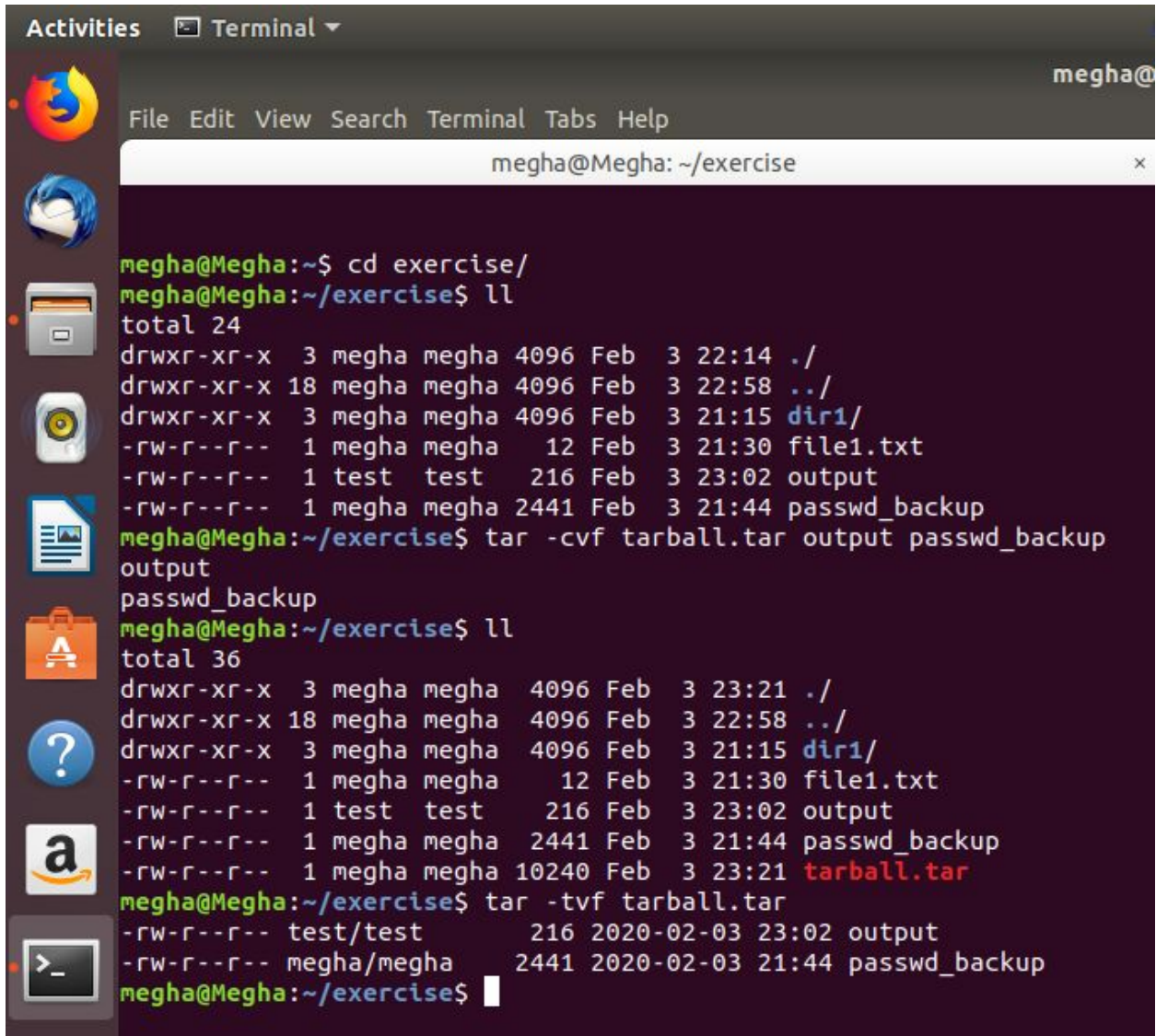

Question 13: Install “zip” package.



A terminal window titled "Terminal" is shown. The user "megha" is at the prompt "megha@Megha:~\$". They enter the command "sudo apt-get install zip". The terminal shows the following output: "[sudo] password for megha:", "Reading package lists... Done", "Building dependency tree", "Reading state information... Done", "zip is already the newest version (3.0-11build1).", and "0 upgraded, 0 newly installed, 0 to remove and 621 not upgraded." The prompt returns to "megha@Megha:~\$".

```
Activities Terminal
megha@Megha:~$ sudo apt-get install zip
[sudo] password for megha:
Reading package lists... Done
Building dependency tree
Reading state information... Done
zip is already the newest version (3.0-11build1).
0 upgraded, 0 newly installed, 0 to remove and 621 not upgraded.
megha@Megha:~$
```

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

A terminal window titled 'megha@Megha: ~/exercise' with a menu bar (File, Edit, View, Search, Terminal, Tabs, Help). The user navigates to the 'exercise' directory and lists files. They then create a tarball named 'tarball.tar' containing 'output' and 'passwd_backup'. Finally, they list the contents of the tarball.

```
megha@Megha:~$ cd exercise/
megha@Megha:~/exercise$ ll
total 24
drwxr-xr-x  3 megha megha 4096 Feb  3 22:14 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 22:58 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha   12 Feb  3 21:30 file1.txt
-rw-r--r--  1 test  test   216 Feb  3 23:02 output
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup
megha@Megha:~/exercise$ tar -cvf tarball.tar output passwd_backup
output
passwd_backup
megha@Megha:~/exercise$ ll
total 36
drwxr-xr-x  3 megha megha 4096 Feb  3 23:21 ./
drwxr-xr-x 18 megha megha 4096 Feb  3 22:58 ../
drwxr-xr-x  3 megha megha 4096 Feb  3 21:15 dir1/
-rw-r--r--  1 megha megha   12 Feb  3 21:30 file1.txt
-rw-r--r--  1 test  test   216 Feb  3 23:02 output
-rw-r--r--  1 megha megha 2441 Feb  3 21:44 passwd_backup
-rw-r--r--  1 megha megha 10240 Feb  3 23:21 tarball.tar
megha@Megha:~/exercise$ tar -tvf tarball.tar
-rw-r--r--  test/test          216 2020-02-03 23:02 output
-rw-r--r--  megha/megha      2441 2020-02-03 21:44 passwd_backup
megha@Megha:~/exercise$
```

Question 15: scp this file to test user.

scp output test@127.0.0.1:~

```
megha@Megha:~ $ scp output test@127.0.0.1:~
test@127.0.0.1's password:
TERM environment variable not set.
Welcome
megha@Megha:~ $
```

But i have a another user neha which is created by adduser command so i transferred the file into neha user

```
megha@Megha:~ $ scp output.txt neha@localhost:~
neha@localhost's password:
output.txt
megha@Megha:~ $ ssh neha@localhost
neha@localhost's password:
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-29-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

491 packages can be updated.
216 updates are security updates.

*** System restart required ***
Last login: Sun Feb  9 12:07:01 2020 from 127.0.0.1
neha@Megha:~$ ls -ls
total 24
12 examples.desktop  4 output.txt  4 scptest  4 scptest2
neha@Megha:~$
```


Question 16: Unzip this tar bar by logging into the remote server

```
Activities Terminal Mon 23:43 test@Megha:~
File Edit View Search Terminal Tabs Help
test@Megha: ~
megha@Megha:~/exercise$ ssh test@localhost
test@localhost's password:
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-29-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

632 packages can be updated.
356 updates are security updates.
```

```
Activities Terminal Mon 23:44 test@Megha: ~
File Edit View Search Terminal Tabs Help
test@Megha: ~ megha@Megha: ~/exercise
welcome
test@Megha:~$ ll
total 48
drwxr-xr-x 4 test test 4096 Feb 3 23:29 ./
drwxr-xr-x 5 root root 4096 Feb 3 22:35 ../
-rw-r--r-- 1 test test 444 Feb 3 23:35 .bash_history
-rw-r--r-- 1 test test 220 Apr 5 2018 .bash_logout
-rw-r--r-- 1 test test 3793 Feb 3 23:15 .bashrc
drwx----- 2 test test 4096 Feb 3 23:29 .cache/
-rw-r--r-- 1 test test 8980 Apr 16 2018 examples.desktop
drwx----- 3 test test 4096 Feb 3 23:29 .gnupg/
-rw-r--r-- 1 test test 807 Apr 5 2018 .profile
-rw-r--r-- 1 test test 1358 Feb 3 23:15 .viminfo
test@Megha:~$ ls
examples.desktop
test@Megha:~$ pwd
/home/test
test@Megha:~$ scp megha@localhost:/home/megha/exercise/tarball.tar .
The authenticity of host 'localhost (127.0.0.1)' can't be established.
ECDSA key fingerprint is SHA256:L5Phgemoft893PVok+OrS52ED9xjLTzkXDlhYrgp/5s.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
megha@localhost's password:
tarball.tar
test@Megha:~$ ll
total 64
drwxr-xr-x 5 test test 4096 Feb 3 23:40 ./
drwxr-xr-x 5 root root 4096 Feb 3 22:35 ../
-rw-r--r-- 1 test test 444 Feb 3 23:35 .bash_history
-rw-r--r-- 1 test test 220 Apr 5 2018 .bash_logout
-rw-r--r-- 1 test test 3793 Feb 3 23:15 .bashrc
drwx----- 2 test test 4096 Feb 3 23:29 .cache/
-rw-r--r-- 1 test test 8980 Apr 16 2018 examples.desktop
drwx----- 3 test test 4096 Feb 3 23:29 .gnupg/
-rw-r--r-- 1 test test 807 Apr 5 2018 .profile
drwx----- 2 test test 4096 Feb 3 23:40 .ssh/
-rw-r--r-- 1 test test 10240 Feb 3 23:40 tarball.tar
```

```
drwxr-xr-x 5 test test 4096 Feb 3 23:29 .gnupg/
-rw-r--r-- 1 test test 807 Apr 5 2018 .profile
drwx----- 2 test test 4096 Feb 3 23:40 .ssh/
-rw-r--r-- 1 test test 10240 Feb 3 23:40 tarball.tar
-rw----- 1 test test 1358 Feb 3 23:15 .viminfo
test@Megha:~$ tar -xvf tarball.tar
output
passwd_backup
test@Megha:~$ ll
total 72
drwxr-xr-x 5 test test 4096 Feb 3 23:41 ./
drwxr-xr-x 5 root root 4096 Feb 3 22:35 ../
-rw----- 1 test test 444 Feb 3 23:35 .bash_history
-rw-r--r-- 1 test test 220 Apr 5 2018 .bash_logout
-rw-r--r-- 1 test test 3793 Feb 3 23:15 .bashrc
drwx----- 2 test test 4096 Feb 3 23:29 .cache/
-rw-r--r-- 1 test test 8980 Apr 16 2018 examples.desktop
drwx----- 3 test test 4096 Feb 3 23:29 .gnupg/
-rw-r--r-- 1 test test 216 Feb 3 23:02 output
-rw-r--r-- 1 test test 2441 Feb 3 21:44 passwd_backup
-rw-r--r-- 1 test test 807 Apr 5 2018 .profile
drwx----- 2 test test 4096 Feb 3 23:40 .ssh/
-rw-r--r-- 1 test test 10240 Feb 3 23:40 tarball.tar
-rw----- 1 test test 1358 Feb 3 23:15 .viminfo
test@Megha:~$
```

Question 17: Download any image from web and move to desktop

```
megha@Megha: ~/exercise
megha@Megha:~/exercise$ wget https://www.electrictoolbox.com/images/icons/linux-bsd.gif
--2020-02-03 23:55:45-- https://www.electrictoolbox.com/images/icons/linux-bsd.gif
Resolving www.electrictoolbox.com (www.electrictoolbox.com)... 104.24.103.21, 104.24.102.21, 2606:4700:3033::6818:6715, ...
Connecting to www.electrictoolbox.com (www.electrictoolbox.com)[104.24.103.21]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 805 [image/gif]
Saving to: 'linux-bsd.gif'

linux-bsd.gif          100%[=====] 805  --.-KB/s  in 0s

2020-02-03 23:55:45 (5.99 MB/s) - 'linux-bsd.gif' saved [805/805]

megha@Megha:~/exercise$ ll
total 48
drwxr-xr-x 3 megha megha 4096 Feb 3 23:55 ./
drwxr-xr-x 18 megha megha 4096 Feb 3 22:58 ../
drwxr-xr-x 3 megha megha 4096 Feb 3 21:15 dir1/
-rw-r--r-- 1 megha megha 12 Feb 3 21:30 file1.txt
-rw-r--r-- 1 megha megha 805 Feb 1 07:41 linux-bsd.gif
-rw-r--r-- 1 test test 216 Feb 3 23:02 output
-rw-r--r-- 1 megha megha 2441 Feb 3 21:44 passwd_backup
-rw-r--r-- 1 megha megha 10240 Feb 3 23:21 tarball.tar
-rw-r--r-- 1 megha megha 418 Feb 3 23:49 wget-log
megha@Megha:~/exercise$ mv linux-bsd.gif ~/Desktop/
megha@Megha:~/exercise$ ls ~/Desktop/
linux-bsd.gif 'Onboarding Guide for Trainees.pdf'
megha@Megha:~/exercise$
```

Question 18: How to get help of commands usages.

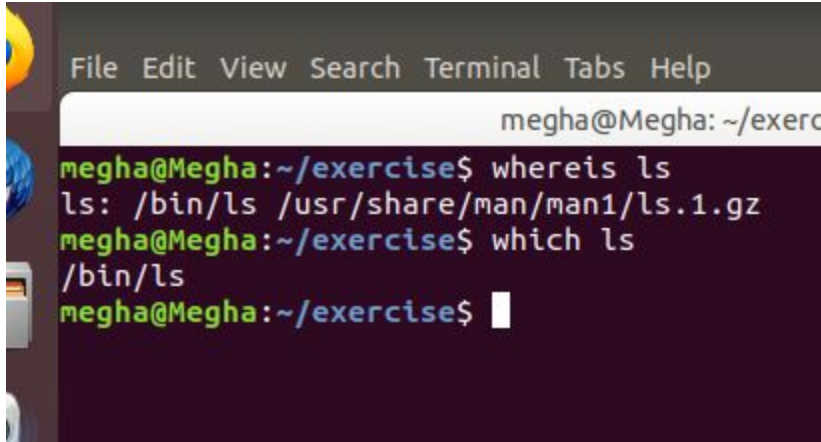
1. `Man <command>`
2. `<command> --help` or `-h`

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

```
File Edit View Search Terminal Tabs Help
megha@Megha: ~/exercise

megha@Megha:~/exercise$ ln -s /etc/services /tmp/ports-info
megha@Megha:~/exercise$ ll /tmp
total 64
drwxrwxrwt 15 root root 4096 Feb  4 00:01 ./
drwxr-xr-x 24 root root 4096 Jan 28 21:01 ../
-rw-r--r--  1 megha megha    0 Feb  3 23:07 aliastesting
-rw-----  1 megha megha    0 Feb  3 20:00 config-err-rdKKE
drwxrwxrwt  2 root root 4096 Feb  3 19:59 .font-unix/
drwxrwxrwt  2 root root 4096 Feb  3 20:00 .ICE-unix/
lrwxrwxrwx  1 megha megha   13 Feb  4 00:01 ports-info -> /etc/services
drwx-----  2 megha megha 4096 Feb  3 20:00 ssh-QdZjRsCPFLRa/
drwx-----  3 root root 4096 Feb  3 19:59 systemd-private-b1d9bdaed9674316a8
drwx-----  3 root root 4096 Feb  3 19:59 systemd-private-b1d9bdaed9674316a8
drwx-----  3 root root 4096 Feb  3 20:00 systemd-private-b1d9bdaed9674316a8
drwx-----  3 root root 4096 Feb  3 19:59 systemd-private-b1d9bdaed9674316a8
drwx-----  3 root root 4096 Feb  3 19:59 systemd-private-b1d9bdaed9674316a8
drwx-----  2 megha megha 4096 Feb  3 20:00 Temp-6fae1c1d-ea23-4577-8587-18111
drwxrwxrwt  2 root root 4096 Feb  3 19:59 .Test-unix/
-r--r--r--  1 gdm gdm    11 Feb  3 19:59 .X1024-lock
drwxrwxrwt  2 root root 4096 Feb  3 19:59 .X11-unix/
drwxrwxrwt  2 root root 4096 Feb  3 19:59 .XIM-unix/
megha@Megha:~/exercise$
```

Question 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 screenshot of a Linux terminal window. The window has a title bar with menu items: File, Edit, View, Search, Terminal, Tabs, Help. The terminal shows the user 'megha' at host 'Megha' in the directory '~/exercise'. The user enters the command 'whereis ls', and the output is 'ls: /bin/ls /usr/share/man/man1/ls.1.gz'. Then, the user enters 'which ls', and the output is '/bin/ls'. The prompt is now ready for the next command.

```
File Edit View Search Terminal Tabs Help
megha@Megha: ~/exerc
megha@Megha:~/exercise$ whereis ls
ls: /bin/ls /usr/share/man/man1/ls.1.gz
megha@Megha:~/exercise$ which ls
/bin/ls
megha@Megha:~/exercise$
```