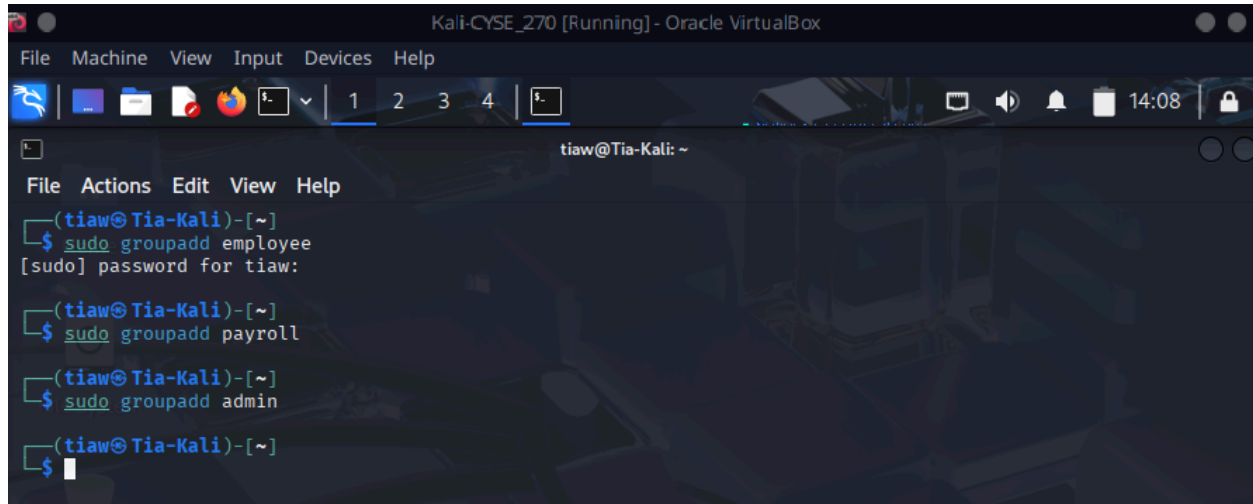


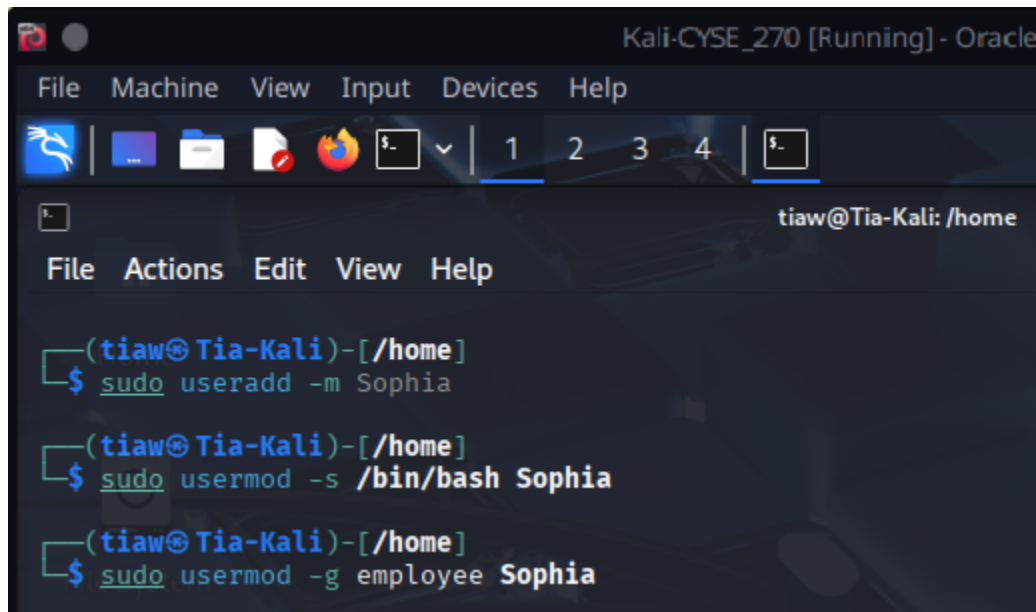
Task A

Step 1 (`sudo groupadd <group_name>`):



```
Kali-CYSE_270 [Running] - Oracle VirtualBox
File Machine View Input Devices Help
1 2 3 4
tiaw@Tia-Kali: ~
File Actions Edit View Help
(tiaw@Tia-Kali)-[~]
$ sudo groupadd employee
[sudo] password for tiaw:
(tiaw@Tia-Kali)-[~]
$ sudo groupadd payroll
(tiaw@Tia-Kali)-[~]
$ sudo groupadd admin
(tiaw@Tia-Kali)-[~]
$
```

Step 2 (`sudo useradd -m <username>; sudo usermod -s /bin/bash -g <group_name> <username>; sudo passwd <username>`):



```
Kali-CYSE_270 [Running] - Oracle
File Machine View Input Devices Help
1 2 3 4
tiaw@Tia-Kali: /home
File Actions Edit View Help
(tiaw@Tia-Kali)-[/home]
$ sudo useradd -m Sophia
(tiaw@Tia-Kali)-[/home]
$ sudo usermod -s /bin/bash Sophia
(tiaw@Tia-Kali)-[/home]
$ sudo usermod -g employee Sophia
```

```
(tiaw@Tia-Kali)-[~]
└─$ sudo useradd -m Olivia

(tiaw@Tia-Kali)-[~]
└─$ sudo usermod -s /bin/bash -g payroll Olivia

(tiaw@Tia-Kali)-[~]
└─$ sudo useradd -m Emma

(tiaw@Tia-Kali)-[~]
└─$ sudo usermod -s /bin/bash -g admin Emma

(tiaw@Tia-Kali)-[~]
└─$
```

Step 3 (`sudo usermod -aG twarr013 <username>`: `cat /etc/group` OR `sudo groups <username>`):

```
File Actions Edit View Help

(tiaw@Tia-Kali)-[~]
└─$ sudo usermod -aG twarr013 Sophia

(tiaw@Tia-Kali)-[~]
└─$ sudo usermod -aG twarr013 Olivia

(tiaw@Tia-Kali)-[~]
└─$ sudo usermod -aG twarr013 Emma

(tiaw@Tia-Kali)-[~]
└─$ cat /etc/group | tail -10
user6:x:1016:
Travis:x:1017:
travismedia:x:6002:
employee:x:6003:
payroll:x:6004:
admin:x:6005:
Sophia:x:1018:
Olivia:x:1019:
Emma:x:1020:
twarr013:x:6006: Sophia, Olivia, Emma

(tiaw@Tia-Kali)-[~]
└─$ sudo groups Olivia
Olivia : payroll twarr013

(tiaw@Tia-Kali)-[~]
└─$ sudo groups Emma
Emma : admin twarr013

(tiaw@Tia-Kali)-[~]
└─$ sudo groups Sophia
Sophia : employee twarr013

(tiaw@Tia-Kali)-[~]
└─$
```

Step 4 (sudo mkdir /home/cyse_project: sudo chgrp twarr013 /home/cyse_project: ls -ld /home/cyse_project):

```
File Actions Edit View Help

(tiaw@Tia-Kali)-[~]
└─$ sudo mkdir /home/cyse_project

(tiaw@Tia-Kali)-[~]
└─$ sudo chgrp twarr013 /home/cyse_project
```

```
(tiaw@Tia-Kali)-[~]
└─$ ls -ld /home/cyse_project
drwxr-xr-x 2 root twarr013 4096 Oct 11 01:28 /home/cyse_project

(tiw@Tia-Kali)-[~]
└─$
```

Step 5 (sudo chmod 770 /home/cyse_project; ls -ld /home/cyse_project):

```
(tiaw@Tia-Kali)-[~]
└─$ sudo chmod 770 /home/cyse_project

(tiw@Tia-Kali)-[~]
└─$ ls -ld /home/cyse_project
drwxrwx--- 2 root twarr013 4096 Oct 11 01:28 /home/cyse_project

(tiw@Tia-Kali)-[~]
└─$
```

Step 6 (umask 027; umask; touch sophia_demo.txt; ls -l sophia_demo.txt)

```
Sophia@Tia-Kali: ~
File Actions Edit View Help

(Sophia@Tia-Kali)-[~]
└─$ umask 027

(Sophia@Tia-Kali)-[~]
└─$ umask
0027

(Sophia@Tia-Kali)-[~]
└─$ touch sophia_demo.txt

(Sophia@Tia-Kali)-[~]
└─$ ls -l sophia_demo.txt
-rw-r----- 1 Sophia employee 0 Oct 11 01:43 sophia_demo.txt

(Sophia@Tia-Kali)-[~]
└─$
```

Step 7 (vi Sophia_homework; cat Sophia_homework; ls -l Sophia_homework)

```
(Sophia@Tia-Kali)-[~]
└─$ pwd
/home/Sophia

(Sophia@Tia-Kali)-[~]
└─$ vi Sophia_homework

(Sophia@Tia-Kali)-[~]
└─$ cat Sophia_homework
Tia M. Warren

(Sophia@Tia-Kali)-[~]
└─$ ls -l Sophia_homework
-rw-r----- 1 Sophia employee 14 Oct 11 01:44 Sophia_homework

(Sophia@Tia-Kali)-[~]
└─$
```

Step 8 (cp Sophia_homework /home/cyse_project/; cd /home/cyse_project/ ls -l Sophia_homework)

```
(Sophia@Tia-Kali)-[~]
└─$ cp Sophia_homework /home/cyse_project/

(Sophia@Tia-Kali)-[~]
└─$ cd /home/cyse_project/

(Sophia@Tia-Kali)-[/home/cyse_project]
└─$ ls -l Sophia_homework
-rw-r----- 1 Sophia employee 14 Oct 11 01:47 Sophia_homework

(Sophia@Tia-Kali)-[/home/cyse_project]
└─$
```

Step 9 & 10 (su Emma; cat /home/cyse_project/Sophia_homework; exit):

```
(Sophia@Tia-Kali)-[~]
└─$ su Emma
Password:
(Emma@Tia-Kali)-[/home/Sophia]
└─$ cat /home/cyse_project/Sophia_homework
cat: /home/cyse_project/Sophia_homework: Permission denied

(Emma@Tia-Kali)-[/home/Sophia]
└─$ exit
exit

(Sophia@Tia-Kali)-[~]
└─$ exit
exit

(tiaw@Tia-Kali)-[~]
└─$
```

Task B

Step 1 (sudo chmod g+s /home/cyse_project; ls -ld home/cyse_project):

```
(tiaw@Tia-Kali)-[~]
└─$ sudo chmod g+s /home/cyse_project
[sudo] password for tiaw:

(tiaw@Tia-Kali)-[~]
└─$ ls -ld /home/cyse_project
drwxrws— 2 root twarr013 4096 Oct 11 01:47 /home/cyse_project
```

Step 2 & 3 (su Sophia; cd ; cp Sophia_homework /home/cyse_project/Sophia_homework2; su Emma; cat /home/cyse_project/Sophia_homework2; ls -l /home/cyse_project/Sophia_homework2):

```

(Sophia@Tia-Kali)-[~]
└─$ cp Sophia_homework /home/cyse_project/Sophia_homework2

(Sophia@Tia-Kali)-[~]
└─$ su Emma
Password:
(Emma@Tia-Kali)-[/home/Sophia]
└─$ cat /home/cyse_project/Sophia_homework2
Tia M. Warren

(Emma@Tia-Kali)-[/home/Sophia]
└─$ ls -l /home/cyse_project/Sophia_homework2
-rw-r----- 1 Sophia twarr013 14 Oct 11 23:57 /home/cyse_project/Sophia_homework2

(Emma@Tia-Kali)-[/home/Sophia]
└─$ ls -ld /home/cyse_project/
drwxrws--- 2 root twarr013 4096 Oct 11 23:57 /home/cyse_project/

(Emma@Tia-Kali)-[/home/Sophia]
└─$ █

```

Task C

Step 1 (sudo chmod g-s /home/cyse_project):

```

(tiaw@Tia-Kali)-[~]
└─$ sudo chmod g-s /home/cyse_project
[sudo] password for tiaw:

```

Step 2 (su Sophia; cd ; cp Sophia_homework /home/cyse_project/Sophia_homework3):

```

(tiaw@Tia-Kali)-[~]
└─$ su Sophia
Password:
(Sophia@Tia-Kali)-[/home/tiaw]
└─$ cd

(Sophia@Tia-Kali)-[~]
└─$ cp Sophia_homework /home/cyse_project/Sophia_homework3

```

Step 3 (su Olivia; cat /home/cyse_project/Sophia_homework3; ls -l /home/cyse_project/):

```

(Sophia@Tia-Kali)-[~]
└─$ su Olivia
Password:
(Olivia@Tia-Kali)-[/home/Sophia]
└─$ cat /home/cyse_project/Sophia_homework3
cat: /home/cyse_project/Sophia_homework3: Permission denied

```

```
(Olivia@Tia-Kali)-[/home/Sophia]
└─$ ls -l /home/cyse_project/
total 12
-rw-r----- 1 Sophia employee 14 Oct 11 23:54 Sophia_homework
-rw-r----- 1 Sophia twarr013 14 Oct 11 23:57 Sophia_homework2
-rw-r----- 1 Sophia employee 14 Oct 12 00:04 Sophia_homework3

(Olivia@Tia-Kali)-[/home/Sophia]
└─$
```

Extra Credit

Step 1 (su Olivia; rm /home/cyse_project/Sophia_homework):

```
(Olivia@Tia-Kali)-[/home/Sophia]
└─$ rm /home/cyse_project/Sophia_homework
rm: remove write-protected regular file '/home/cyse_project/Sophia_homework'? y

(Olivia@Tia-Kali)-[/home/Sophia]
└─$ exit
exit

(Sophia@Tia-Kali)-[~]
└─$ exit
exit

(tiaw@Tia-Kali)-[~]
└─$ sudo chmod +t /home/cyse_project

(tiaw@Tia-Kali)-[~]
└─$ su Olivia
Password:
(Olivia@Tia-Kali)-[/home/tiaw]
└─$ rm /home/cyse_project/Sophia_homework3
rm: remove write-protected regular file '/home/cyse_project/Sophia_homework3'? y
rm: cannot remove '/home/cyse_project/Sophia_homework3': Operation not permitted

(Olivia@Tia-Kali)-[/home/tiaw]
└─$
```

Step 2 (sudo chmod +t /home/cyse_project):

```
(tiaw@Tia-Kali)-[~]
└─$ sudo chmod +t /home/cyse_project
```

Step 3 (su Olivia; rm /home/cyse_project/Sophia_homework3)

```
(tiaw@Tia-Kali)-[~]
└─$ su Olivia
Password:
(Olivia@Tia-Kali)-[/home/tiaw]
└─$ rm /home/cyse_project/Sophia_homework3
rm: remove write-protected regular file '/home/cyse_project/Sophia_homework3'? y
rm: cannot remove '/home/cyse_project/Sophia_homework3': Operation not permitted

(Olivia@Tia-Kali)-[/home/tiaw]
└─$ ls -l /home/cyse_project/Sophia_homework3
-rw-r----- 1 Sophia employee 14 Oct 12 00:04 /home/cyse_project/Sophia_homework3

(Olivia@Tia-Kali)-[/home/tiaw]
└─$ ls -ld /home/cyse_project/
drwxrwx--T 2 root twarr013 4096 Oct 12 00:12 /home/cyse_project/

(Olivia@Tia-Kali)-[/home/tiaw]
└─$ █
```

The file can't be deleted because Sticky Bit is set, and the owner of the Sophia_homework3 file is Sophia, so no other users can delete the file.