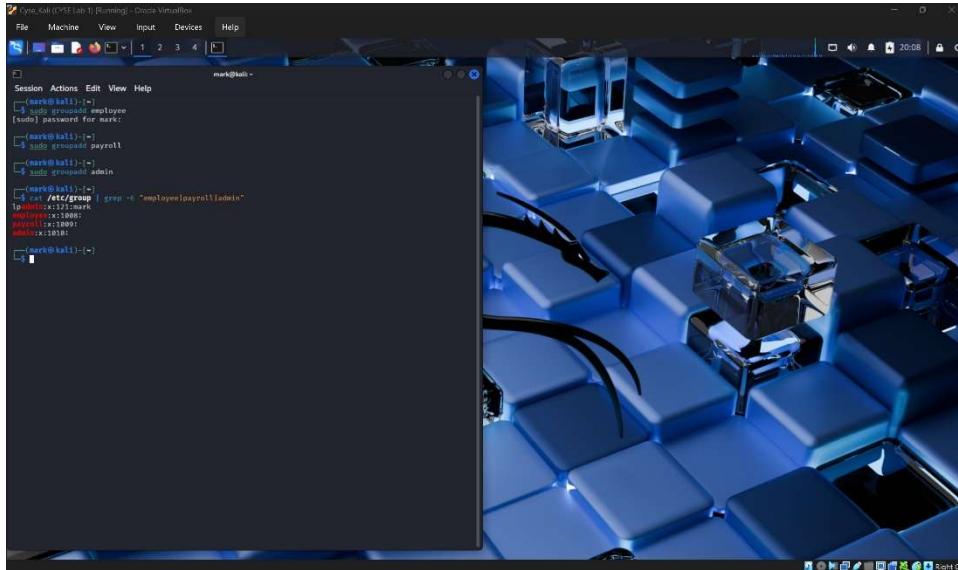


CYSE 270 Assignment 6 – File Permissions

Task A – Step 1 - Create three groups- employee, payroll, and admin. (You may refer to the slides under Module 2 – Group Management)



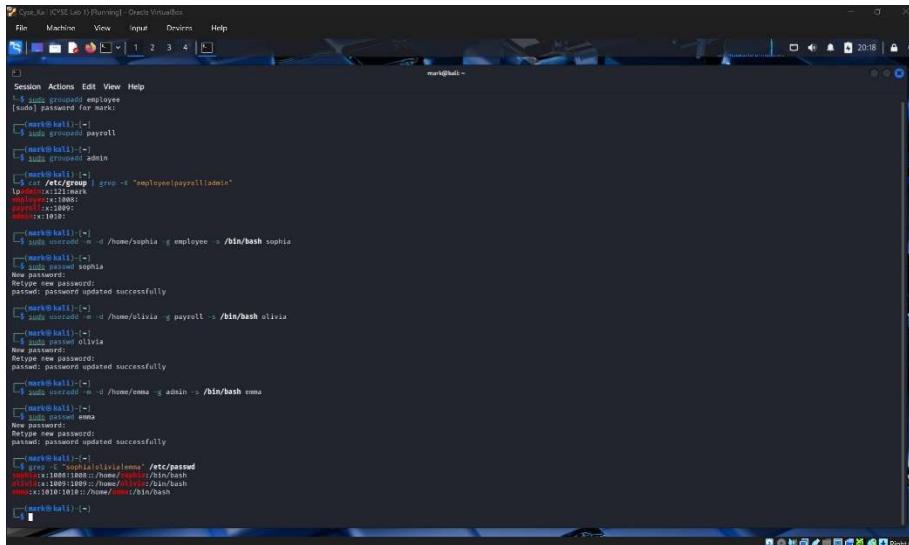
```
mark@kali:~$ sudo groupadd employee
[sudo] password for mark:
mark@kali:~$ sudo groupadd payroll
mark@kali:~$ sudo groupadd admin
mark@kali:~$ cat /etc/group | grep -E "employee|payroll|admin"
lp:x:122:mark
employee:x:1000:
payroll:x:1001:
admin:x:1002:
mark@kali:~$
```

used sudo groupadd employee

sudo groupadd payroll

sudo groupadd admin then verified.

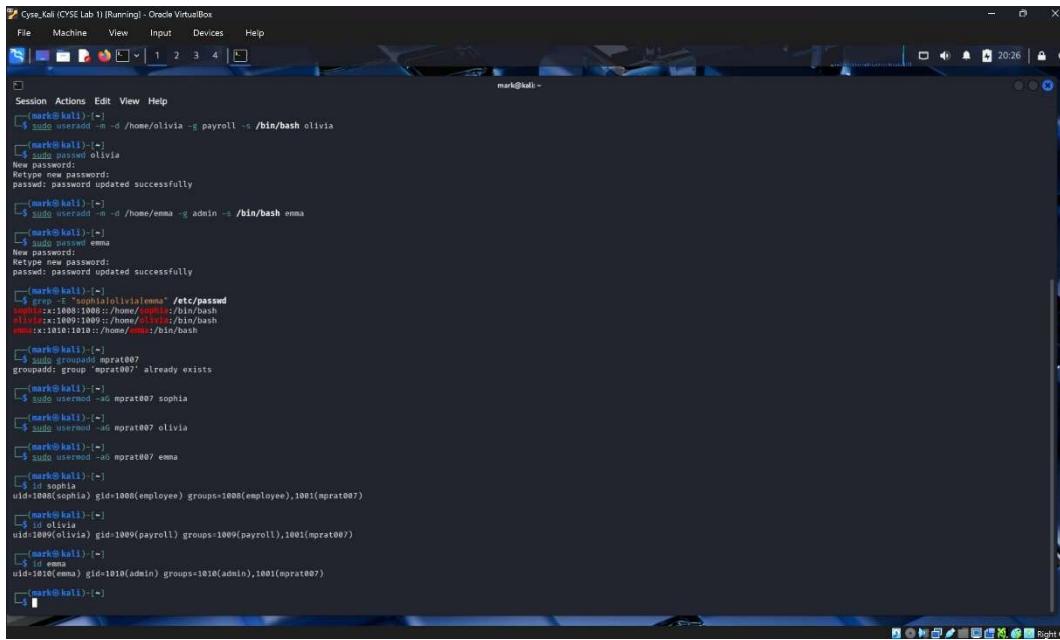
Step 2 - Step 2. Create three user accounts with a specified home directory for Sophia, Olivia, and Emma. Set the primary group for Sophia, Olivia, and Emma to "employee", "payroll", and "admin", respectively. And change their login shell to /bin/bash. Don't forget to set their passwords.



```
mark@kali:~$ sudo groupadd employee
[sudo] password for mark:
mark@kali:~$ sudo groupadd payroll
mark@kali:~$ sudo groupadd admin
mark@kali:~$ cat /etc/group | grep -E "employee|payroll|admin"
lp:x:122:mark
employee:x:1000:
payroll:x:1001:
admin:x:1002:
mark@kali:~$ sudo useradd -d /home/sophia -g employee -s /bin/bash sophia
mark@kali:~$ sudo passwd sophia
New password:
Retype new password:
password: password updated successfully
mark@kali:~$ sudo useradd -d /home/olivia -g payroll -s /bin/bash olivia
mark@kali:~$ sudo passwd olivia
New password:
Retype new password:
password: password updated successfully
mark@kali:~$ sudo useradd -d /home/emma -g admin -s /bin/bash emma
mark@kali:~$ sudo passwd emma
New password:
Retype new password:
password: password updated successfully
mark@kali:~$ cat /etc/passwd | grep -E "sophia|olivia|emma"
sophia:x:1000:1000::/home/sophia:/bin/bash
olivia:x:1001:1001::/home/olivia:/bin/bash
emma:x:1002:1002::/home/emma:/bin/bash
mark@kali:~$
```

used sudo useradd to create users with home directores (-m -d) with primary group (-g), and shell (-s). Passwords were set to 1234 using sudo passwd.

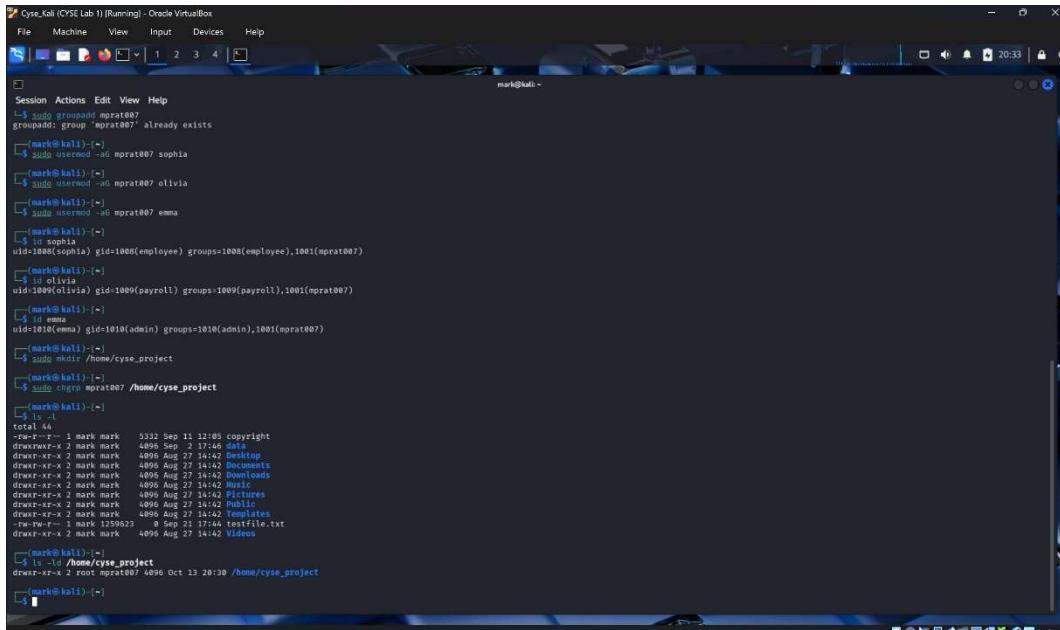
Step 3 - Create a shared group called "mprat007" and set this shared group as the above accounts' secondary group. After this step, remember to check each user's group profile.



```
mark@kali:~$ sudo groupadd mprat007
mark@kali:~$ sudo usermod -aG mprat007 sophia
mark@kali:~$ sudo usermod -aG mprat007 olivia
mark@kali:~$ sudo usermod -aG mprat007 emma
mark@kali:~$ id sophia
uid=1000(sophia) gid=1000(employee) groups=1008(employee),1001(mprat007)
mark@kali:~$ id olivia
uid=1009(olivia) gid=1009(payroll) groups=1009(payroll),1001(mprat007)
mark@kali:~$ id emma
uid=1010(emma) gid=1010(admin) groups=1010(admin),1001(mprat007)
mark@kali:~$
```

used sudo groupadd mprat007, group already existed. Modified Sophia Olivia and Emma using sudo usermod -aG to append users without overwriting existing groups.

Step 4 - Create a directory named /home/cyse_project, which is to be owned by the "mprat007" group which is a shared group. After this step, remember to check the permission of this shared directory.

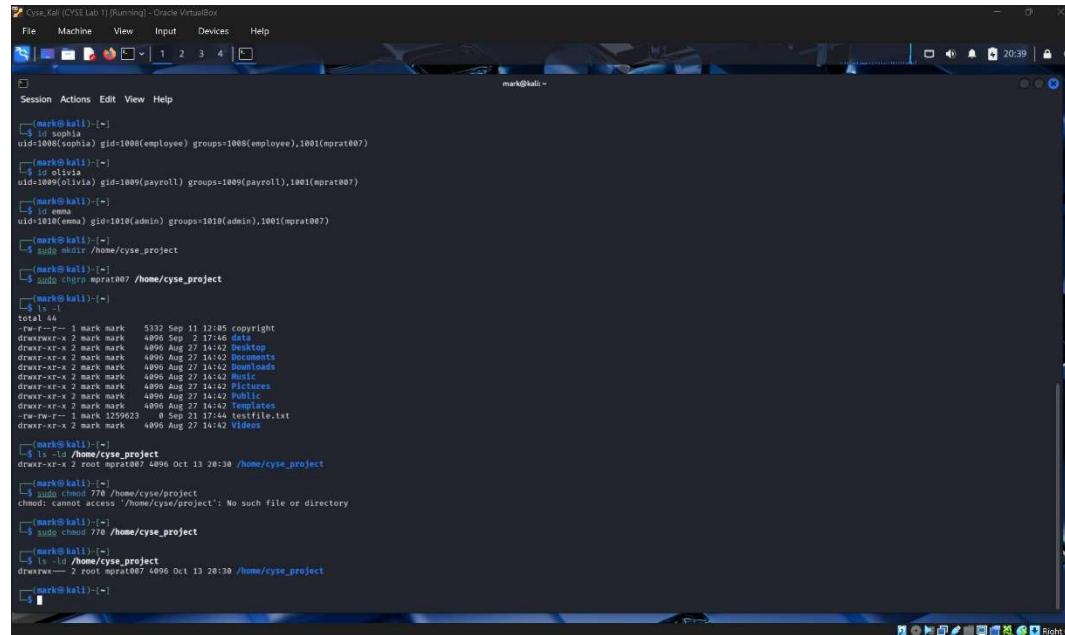


```
mark@kali:~$ sudo groupadd mprat007
mark@kali:~$ sudo usermod -aG mprat007 sophia
mark@kali:~$ sudo usermod -aG mprat007 olivia
mark@kali:~$ sudo usermod -aG mprat007 emma
mark@kali:~$ id sophia
uid=1000(sophia) gid=1000(employee) groups=1008(employee),1001(mprat007)
mark@kali:~$ id olivia
uid=1009(olivia) gid=1009(payroll) groups=1009(payroll),1001(mprat007)
mark@kali:~$ id emma
uid=1010(emma) gid=1010(admin) groups=1010(admin),1001(mprat007)
mark@kali:~$ sudo mkdir /home/cyse_project
mark@kali:~$ sudo chgrp mprat007 /home/cyse_project
mark@kali:~$ ls -l /home/cyse_project
total 44
-rw-r--r-- 1 mark mark 5332 Sep 11 12:05 copyright
drwxrwxr-x 2 mark mark 4096 Sep 2 17:46 data
drwxrwxr-x 2 mark mark 4096 Sep 2 17:46 download
drwxr-xr-x 2 mark mark 4096 Aug 27 14:42 Documents
drwxr-xr-x 2 mark mark 4096 Aug 27 14:42 Downloads
drwxr-xr-x 2 mark mark 4096 Aug 27 14:42 Pictures
drwxr-xr-x 2 mark mark 4096 Aug 27 14:42 Public
drwxr-xr-x 2 mark mark 4096 Aug 27 14:42 testfile
-rw-r--r-- 1 mark mark 1259023 0 Sep 21 17:44 testfile.txt
drwxr-xr-x 2 mark mark 4096 Aug 27 14:42 Videos
mark@kali:~$ ls -ld /home/cyse_project
drwxr-xr-x 2 root mprat007 4096 Oct 13 20:30 /home/cyse_project
mark@kali:~$
```

made /home/cyse_project directory using mkdir command then changed ownership using chgrp command.

Step 5 - Change the permissions of the /home/cyse_project directory to "rwxrwx---" using the octal method so that only the project group members have access to this directory.

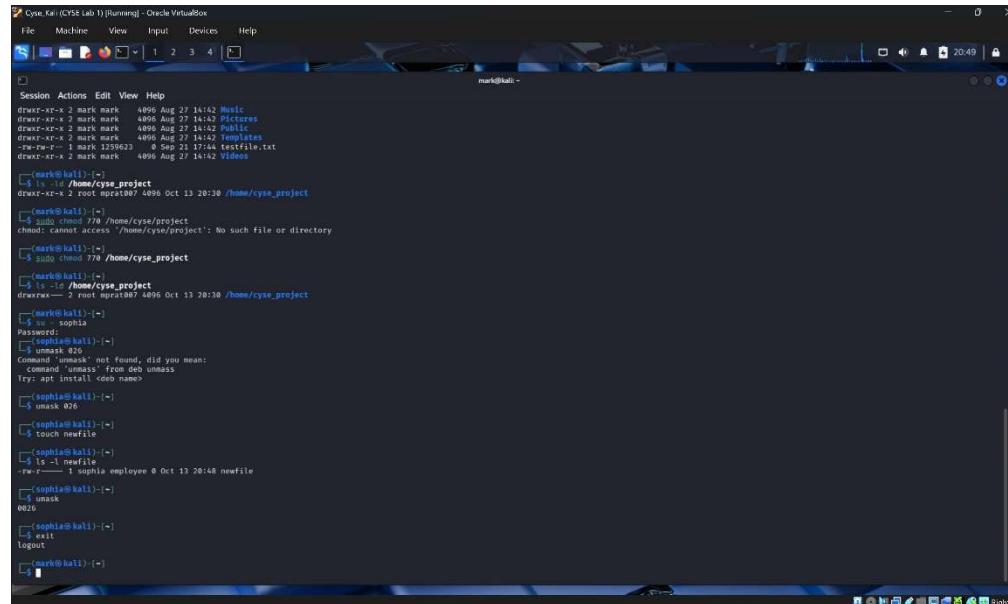
After this step, remember to check the permission of this shared directory.



```
mark@kali:~$ ls sophia
uid=1000(sophia) gid=1000(employee) groups=1000(employee),1001(mprat007)
mark@kali:~$ ls olivia
uid=1009(olivia) gid=1009(payroll) groups=1009(payroll),1001(mprat007)
mark@kali:~$ ls emma
uid=1010(emma) gid=1010(admin) groups=1010(admin),1001(mprat007)
mark@kali:~$ sudo mkdir /home/cyse_project
mark@kali:~$ sudo chmod mprat007 /home/cyse_project
mark@kali:~$ ls -l /home/cyse_project
total 44
-rw-r--  3 mark mark  5392 Sep 11 17:48 copyright
drwxr-x  2 mark mark  4096 Sep  2 17:46 data
drwxr-x  2 mark mark  4096 Aug 27 14:42 Desktop
drwxr-x  2 mark mark  4096 Aug 27 14:42 Documents
drwxr-x  2 mark mark  4096 Aug 27 14:42 Downloads
drwxr-x  2 mark mark  4096 Aug 27 14:42 Music
drwxr-x  2 mark mark  4096 Aug 27 14:42 Pictures
drwxr-x  2 mark mark  4096 Aug 27 14:42 Public
drwxr-x  2 mark mark  4096 Aug 27 14:42 Templates
-rw-rw-r-- 1 mark 1259623  0 Sep 21 17:44 testfile.txt
drwxr-x  2 mark mark  4096 Aug 27 14:42 Videos
mark@kali:~$ ls -l /home/cyse_project
drwxrwx--- 2 root mprat007 4096 Oct 13 20:30 /home/cyse_project
mark@kali:~$ chmod 770 /home/cyse_project
chmod: cannot access '/home/cyse/project': No such file or directory
mark@kali:~$ sudo chmod 770 /home/cyse_project
mark@kali:~$ ls -l /home/cyse_project
drwxrwx--- 2 root mprat007 4096 Oct 13 20:30 /home/cyse_project
mark@kali:~$
```

used sudo chmod 770 /home/cyse_project to change to permissions to "rwxrwx"

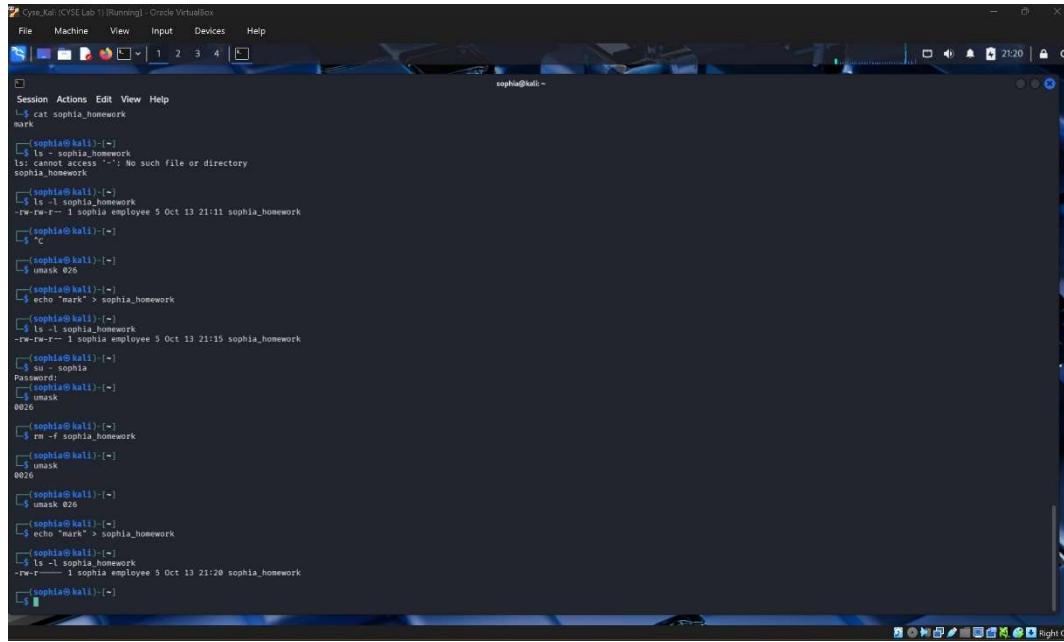
Step 6 - Switch to Sophia's account. Change the default permissions using octal method with umask command, to "rw-r----" for Sophia when she creates a file or directory. Check the value of umask, and permission of a new file after this step.



```
mark@kali:~$ ls -l /home/cyse_project
drwxr-xr-x 2 root mprat007 4096 Oct 13 20:30 /home/cyse_project
mark@kali:~$ su - sophia
Password:
sophia@kali:~$ umask 026
Command 'umask' not found, did you mean:
  command 'unmask' from deb unmask
Try: apt install <deb name>
sophia@kali:~$ umask 026
sophia@kali:~$ touch newfile
sophia@kali:~$ ls -l newfile
-rw-r----- 1 sophia employee 0 Oct 13 20:48 newfile
sophia@kali:~$ rm newfile
rm: newfile: Permission denied
sophia@kali:~$ exit
logout
mark@kali:~$
```

used 'su – Sophia' to switch to sophia's account, used umask 026 to set umask value to 026, used touch to create 'newfile' to verify the change. Used exit to end session with Sophia.

Step 7 - Create a new file called "Sophia_homework" in the home directory of Sophia and put your name in the file as content. After this step, remember to check the content and the permission of the new file. (ls -l Sophia_homework)



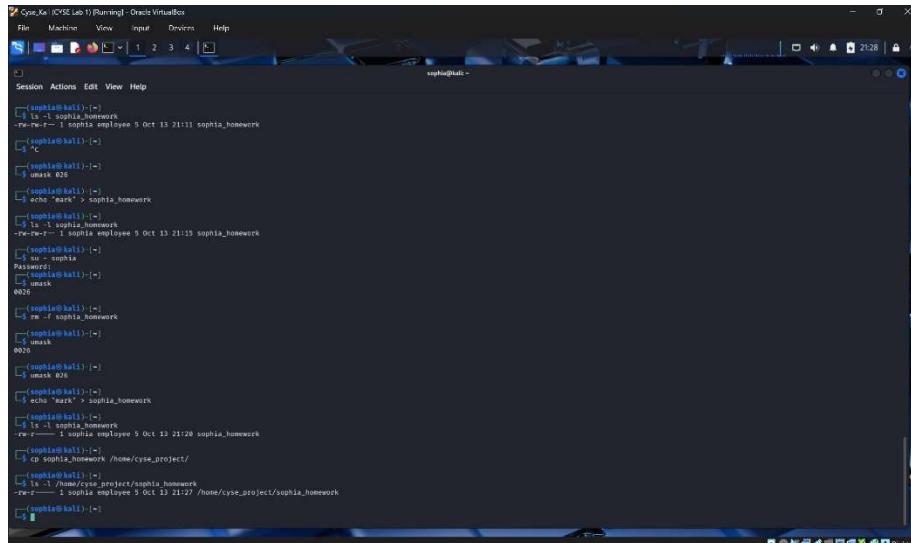
```

sophia@kali:~$ ls -l Sophia_homework
ls: cannot access -: No such file or directory
sophia@kali:~$ ls -l Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:11 Sophia_homework
sophia@kali:~$ 
sophia@kali:~$ umask 026
sophia@kali:~$ echo "mark" > Sophia_homework
sophia@kali:~$ ls -l Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:15 Sophia_homework
sophia@kali:~$ su - sophia
Password:
sophia@kali:~$ umask
0026
sophia@kali:~$ rm -f Sophia_homework
sophia@kali:~$ umask
0026
sophia@kali:~$ echo "mark" > Sophia_homework
sophia@kali:~$ ls -l Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:20 Sophia_homework
sophia@kali:~$ 

```

started session using su – sophia, used umask 026 to subtract write permission for group and all for others. Created file using echo “mark” Sophia_homework. Initially I had trouble getting the correct permissions for Sophia_homework so had to remove the file and start again. Used ls -l Sophia_homework to verify the fix and it shows correct permissions.

Step 8 - Copy "Sophia_homework" to the /home/cyse_project directory. After this step, remember to check the permission of the file in the shared directory.



```

sophia@kali:~$ ls -l Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:11 Sophia_homework
sophia@kali:~$ 
sophia@kali:~$ umask 026
sophia@kali:~$ echo "mark" > Sophia_homework
sophia@kali:~$ ls -l Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:15 Sophia_homework
sophia@kali:~$ su - sophia
Password:
sophia@kali:~$ umask
0026
sophia@kali:~$ rm -f Sophia_homework
sophia@kali:~$ umask 026
sophia@kali:~$ echo "mark" > Sophia_homework
sophia@kali:~$ ls -l Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:20 Sophia_homework
sophia@kali:~$ cp Sophia_homework /home/cyse_project/
sophia@kali:~$ ls -l /home/cyse_project/Sophia_homework
-rw-r--r-- 1 sophia employee 5 Oct 13 21:27 /home/cyse_project/Sophia_homework
sophia@kali:~$ 

```

used cp Sophia_homework /home/cyse_project/ to copy file then ls -l /home/cyse_project/Sophia_homework to verify correct permissions.

Step 9 - Step 9. Switch to Emma's account. Try to read "Sophia_homework" in the /home/cyse_project Directory.

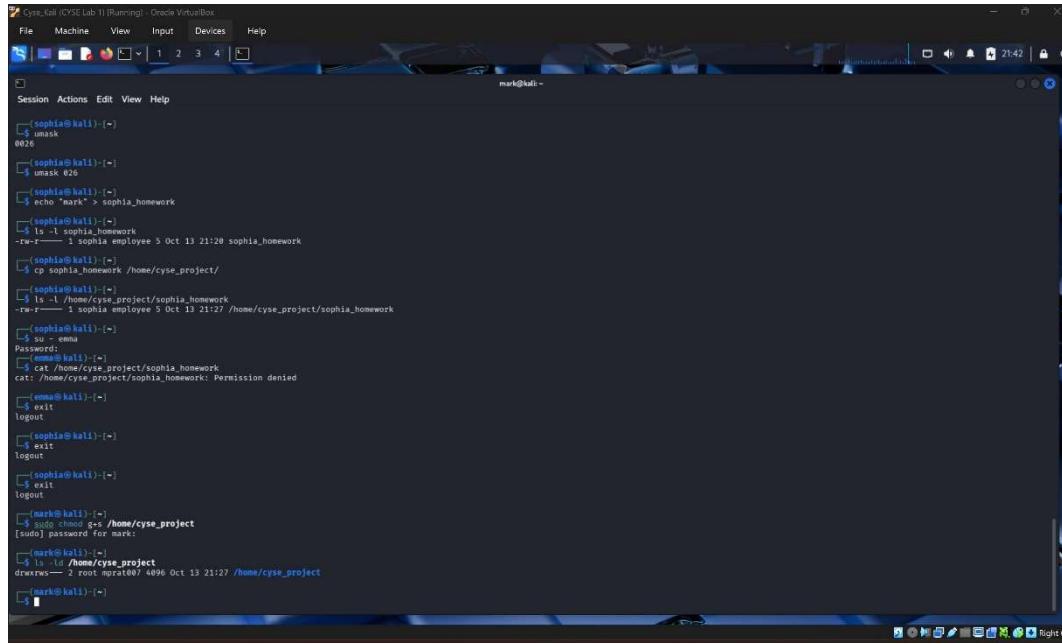
```
cyse_kali (CygLab 1) [Running] - Create VirtualBox
File Machine View Input Devices Help
Session Actions Edit View Help
emma@kali: ~
[emma@kali: ~]
$ umask 022
[emma@kali: ~]
$ echo "mark" > sophia_homework
[emma@kali: ~]
$ ls -l sophia_homework
-rw-rw-r- 1 sophia employee 5 Oct 13 21:15 sophia_homework
[emma@kali: ~]
$ su - sophia
Password:
emma@kali: ~]
$ umask
0026
[emma@kali: ~]
$ rm -f sophia_homework
[emma@kali: ~]
$ umask
0026
[emma@kali: ~]
$ umask 022
[emma@kali: ~]
$ echo "mark" > sophia_homework
[emma@kali: ~]
$ ls -l sophia_homework
-rw-r----- 1 sophia employee 5 Oct 13 21:20 sophia_homework
[emma@kali: ~]
$ cp sophia_homework /home/cyse_project/
[emma@kali: ~]
$ ls -l /home/cyse_project/sophia_homework
-rw-r----- 1 sophia employee 5 Oct 13 21:27 /home/cyse_project/sophia_homework
[emma@kali: ~]
$ su - emma
Password:
[emma@kali: ~]
$ cat /home/cyse_project/sophia_homework
cat: /home/cyse_project/sophia_homework: Permission denied
[emma@kali: ~]
```

switched to emmas account using su – emma. Tried to read sophia’s homework using cat /home/cyse_project/Sophia_homework. Permission was denied as expected.

Step 10 - Exit out of Emma's account and Sophia's account.

exited out of all sessions of Sophia and emma using the exit command.

Task B Step 1 - Switch to root or the regular user's account. To allow group members to access the files shared in the shared directory, you need to fix the sharing issue by setting the correct SGID group values to /home/cyse_project directory.



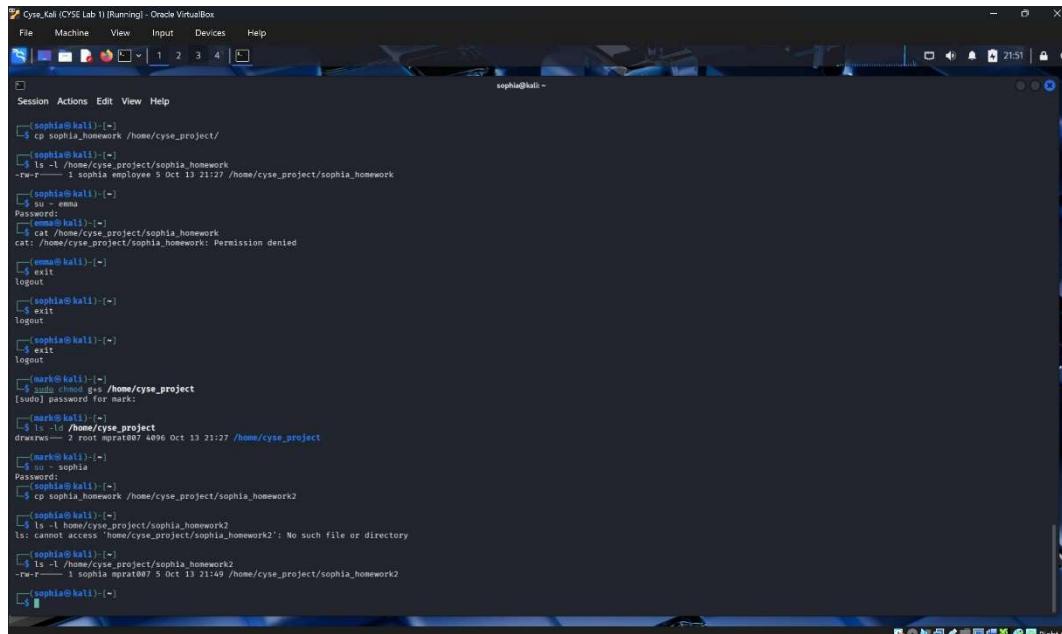
```

mark@kali:~$ su - mark
[sudo] password for mark:
mark@kali:~$ cd /home/cyse_project
mark@kali:~/home/cyse_project$ ls -ld
drwxrws--- 2 root mpriat007 4096 Oct 13 21:27 /home/cyse_project
mark@kali:~/home/cyse_project$ 

```

used sudo chmod g+s so directory files inherit group permissions. Verified using ls – ld /home/cyse_project.

Step 2 - Switch to Sophia's account. Copy "Sophia_homework" to the /home/cyse_project directory as "Sophia_homework2".



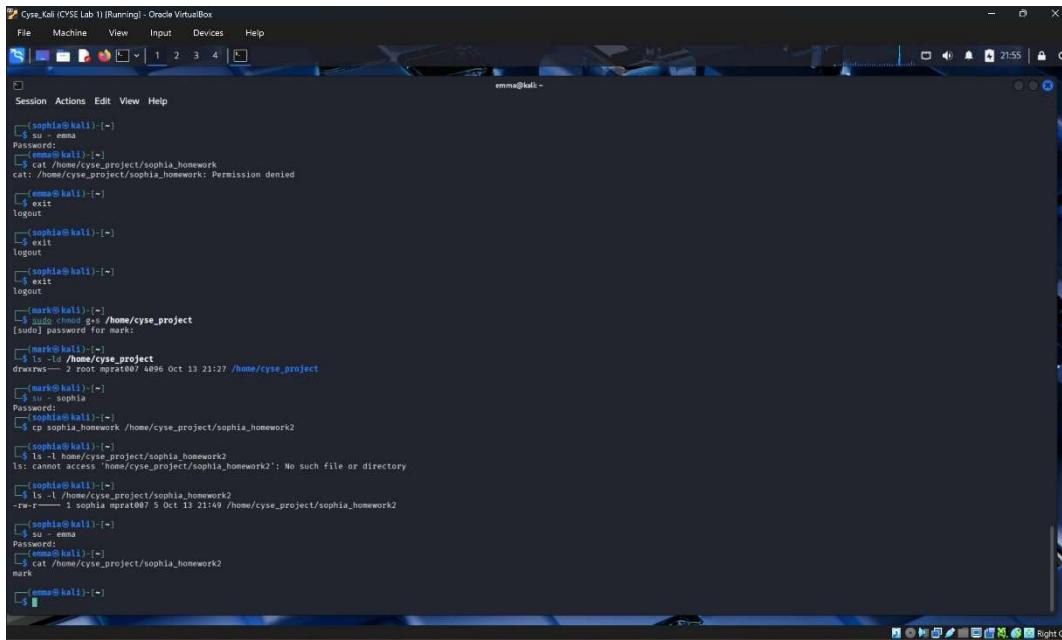
```

mark@kali:~$ su - sophia
[sudo] password for mark:
sophia@kali:~$ cp sophia_homework /home/cyse_project/
sophia@kali:~/home/cyse_project$ ls -l
-rw-r--r-- 1 sophia employee 5 Oct 13 21:27 /home/cyse_project/sophia_homework
sophia@kali:~/home/cyse_project$ 
sophia@kali:~$ su - emma
Password:
emma@kali:~$ cat /home/cyse_project/sophia_homework
cat: /home/cyse_project/sophia_homework: Permission denied
emma@kali:~$ 
emma@kali:~$ exit
logout
sophia@kali:~$ 
sophia@kali:~$ exit
logout
mark@kali:~$ 
mark@kali:~$ sudo chmod g+s /home/cyse_project
[sudo] password for mark:
mark@kali:~$ ls -ld /home/cyse_project
drwxrws--- 2 root mpriat007 4096 Oct 13 21:27 /home/cyse_project
mark@kali:~/home/cyse_project$ 
mark@kali:~$ cp sophia_homework /home/cyse_project/sophia_homework2
mark@kali:~/home/cyse_project$ ls -l /home/cyse_project/sophia_homework2
ls: cannot access '/home/cyse_project/sophia_homework2': No such file or directory
mark@kali:~/home/cyse_project$ 
mark@kali:~$ 

```

switched to sophia's account using su – Sophia, used cp Sophia_homework /home/cyse_project/Sophia_homework2 to copy into Sophia_homework2.

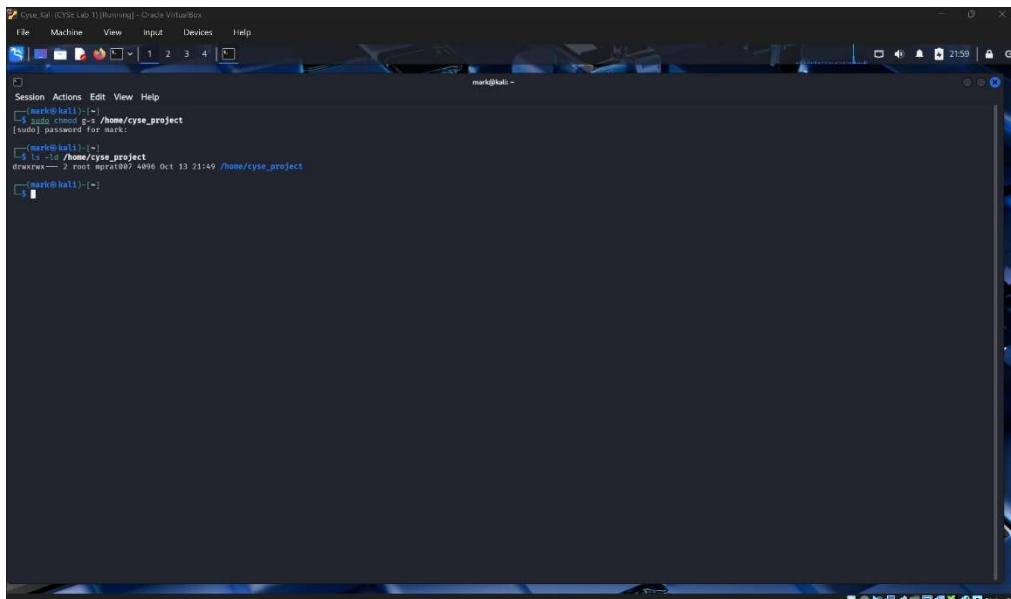
Step 3 - Switch to Emma's account. Try to read "Sophia_homework2" in the /home/cyse_project directory.



```
File Machine View Input Devices Help
Session Actions Edit View Help
< (sophia@kali) ~>
└─ su - emma
Password: 
└─ (emma@kali) ~>
└─ cat /home/cyse_project/sophia_homework
cat: /home/cyse_project/sophia_homework: Permission denied
└─ (emma@kali) ~>
└─ exit
└─ logout
└─ (sophia@kali) ~>
└─ exit
└─ logout
└─ (sophia@kali) ~>
└─ exit
└─ logout
└─ (mark@kali) ~>
└─ sudo chmod g+s /home/cyse_project
(sudo) password: mark:
└─ (mark@kali) ~>
└─ ls -l /home/cyse_project
drwxr-s--- 2 root mark 4096 Oct 13 21:27 /home/cyse_project
└─ (mark@kali) ~>
└─ vi ~ - sophia
Password: 
└─ (sophia@kali) ~>
└─ cp sophia_homework /home/cyse_project/sophia_homework2
└─ (sophia@kali) ~>
└─ ls -l /home/cyse_project/sophia_homework2
ls: cannot access '/home/cyse_project/sophia_homework2': No such file or directory
└─ (sophia@kali) ~>
└─ ls -l /home/cyse_project/sophia_homework2
-rw-r----- 1 sophia mark 4096 Oct 13 21:49 /home/cyse_project/sophia_homework2
└─ (sophia@kali) ~>
└─ su - emma
Password: 
└─ (emma@kali) ~>
└─ cat /home/cyse_project/sophia_homework2
mark
└─ (emma@kali) ~>
```

switched to emma's account using su – emma, read homework2 file successfully using cat /home/cyse_project_homework2.

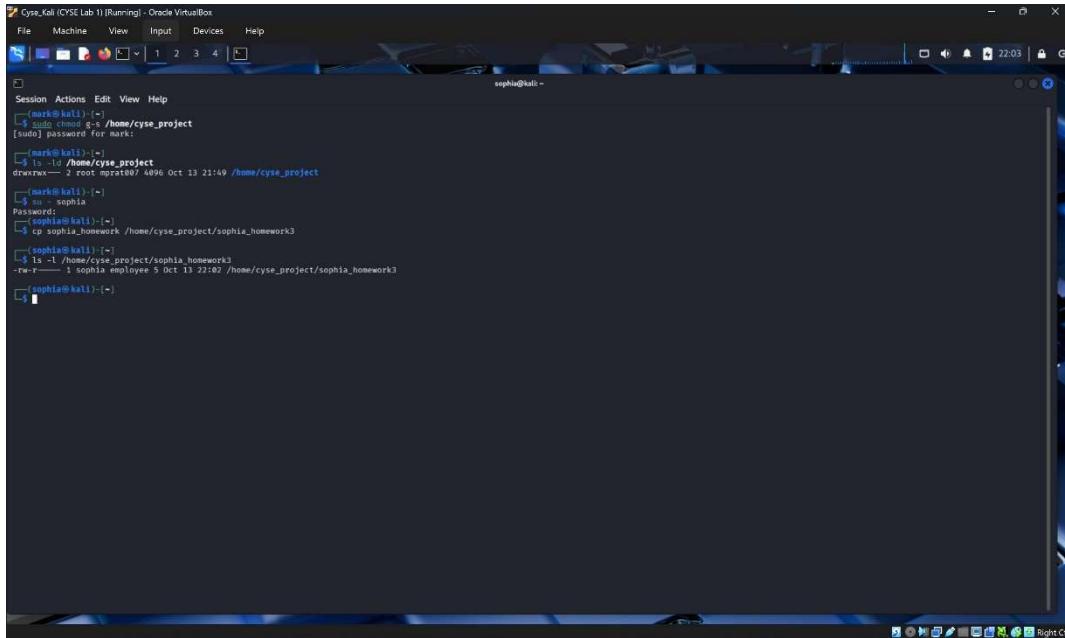
Task C Step 1 - Switch to root the regular user's account. To disallow group members to access the files in the shared folder, you need to fix the sharing issue by setting the correct SGID group values to /home/cyse_project directory to remove the group user read permission.



```
File Machine View Input Devices Help
Session Actions Edit View Help
< (mark@kali) ~>
└─ sudo chmod g+s /home/cyse_project
(sudo) password: mark:
└─ (mark@kali) ~>
└─ ls -l /home/cyse_project
drwxr-s--- 2 root mark 4096 Oct 13 21:49 /home/cyse_project
└─ (mark@kali) ~>
```

used sudo chmod g-s /home/cyse_project to remove sgid so new files won't inherit group read permission.

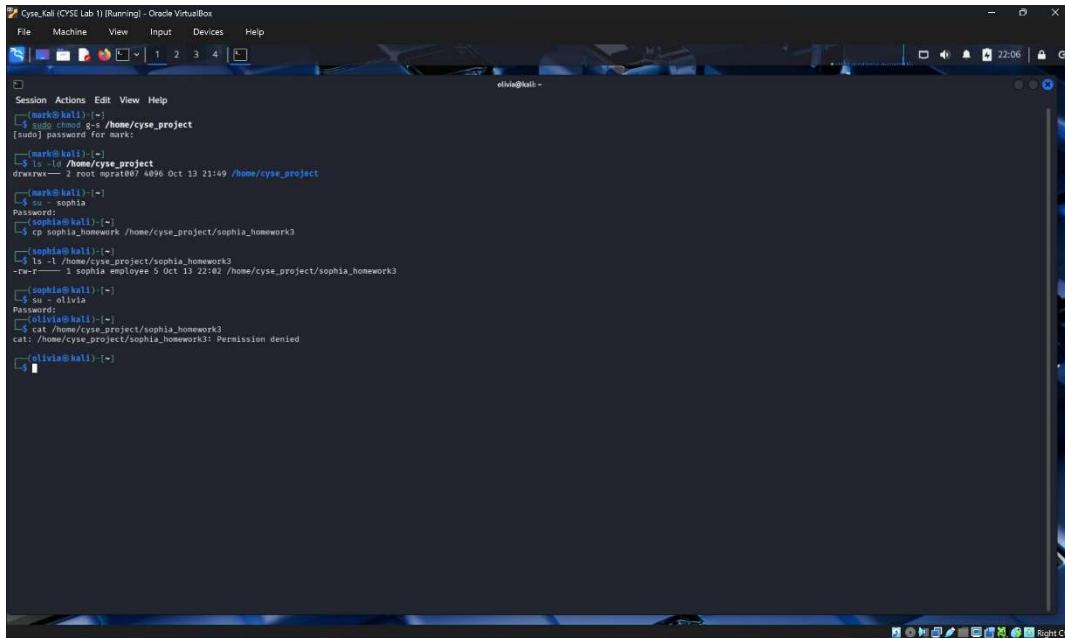
Step 2 - Switch to Sophia's account. Copy "Sophia_homework" to the /home/cyse_project directory as "Sophia_homework3".



```
Cyse_Kali (CYSE Lab 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Session Actions Edit View Help
[mark@kali:~] $ sudo chmod g-s /home/cyse_project
[sudo] password for mark:
[mark@kali:~] $ ls -l /home/cyse_project
drwxrwx 2 root mpfa007 4096 Oct 13 21:49 /home/cyse_project
[mark@kali:~] $ su - sophia
Password:
[sophia@kali:~] $ cp sophia_homework /home/cyse_project/sophia_homework3
[sophia@kali:~] $ ls -l /home/cyse_project/sophia_homework3
-rw-r-- 1 sophia employee 5 Oct 13 22:02 /home/cyse_project/sophia_homework3
[sophia@kali:~] $
```

switched to Sophias account using su – Sophia, used cp Sophia_homework /home/cyse_project/Sophia_homework3 to copy the homework over to a new directory.

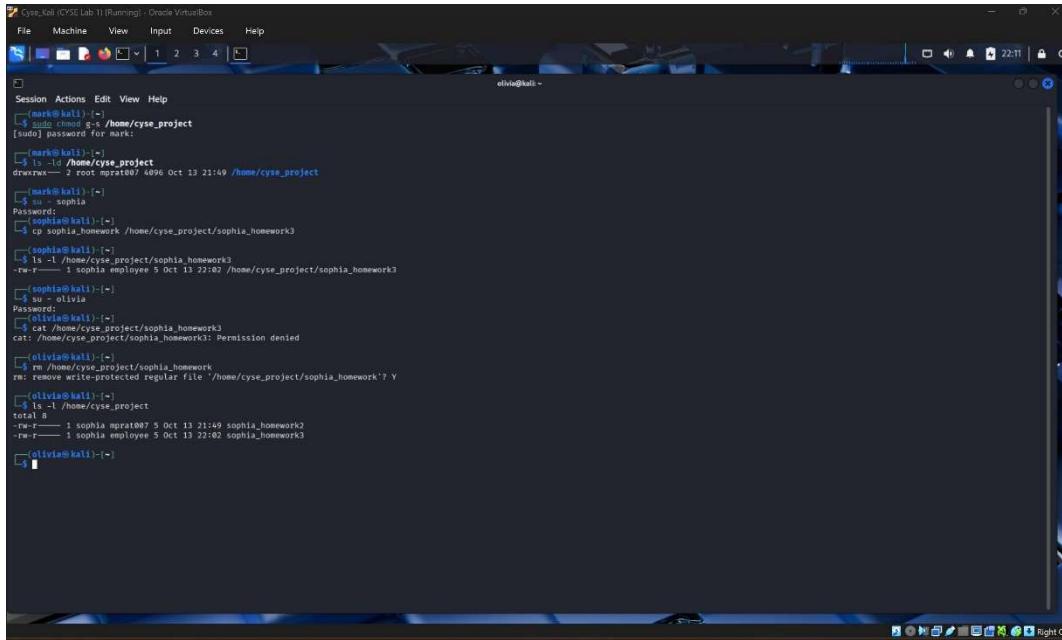
Step 3 - switch to Olivia's account. Try to read "Sophia_home3" in the /home/cyse_project directory.



```
Cyse_Kali (CYSE Lab 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Session Actions Edit View Help
[mark@kali:~] $ sudo chmod g-s /home/cyse_project
[sudo] password for mark:
[mark@kali:~] $ ls -l /home/cyse_project
drwxrwx 2 root mpfa007 4096 Oct 13 21:49 /home/cyse_project
[mark@kali:~] $ su - sophia
Password:
[sophia@kali:~] $ cp sophia_homework /home/cyse_project/sophia_homework3
[sophia@kali:~] $ ls -l /home/cyse_project/sophia_homework3
-rw-r-- 1 sophia employee 5 Oct 13 22:02 /home/cyse_project/sophia_homework3
[sophia@kali:~] $ su - olivia
Password:
[olivia@kali:~] $ cat /home/cyse_project/sophia_homework3
cat: /home/cyse_project/sophia_homework3: Permission denied
[olivia@kali:~] $
```

switched to Olivias account using su – Olivia, tried to read the homework3 file using cat /home/cyse_project/Sophia_homework3 with permission denied as expected.

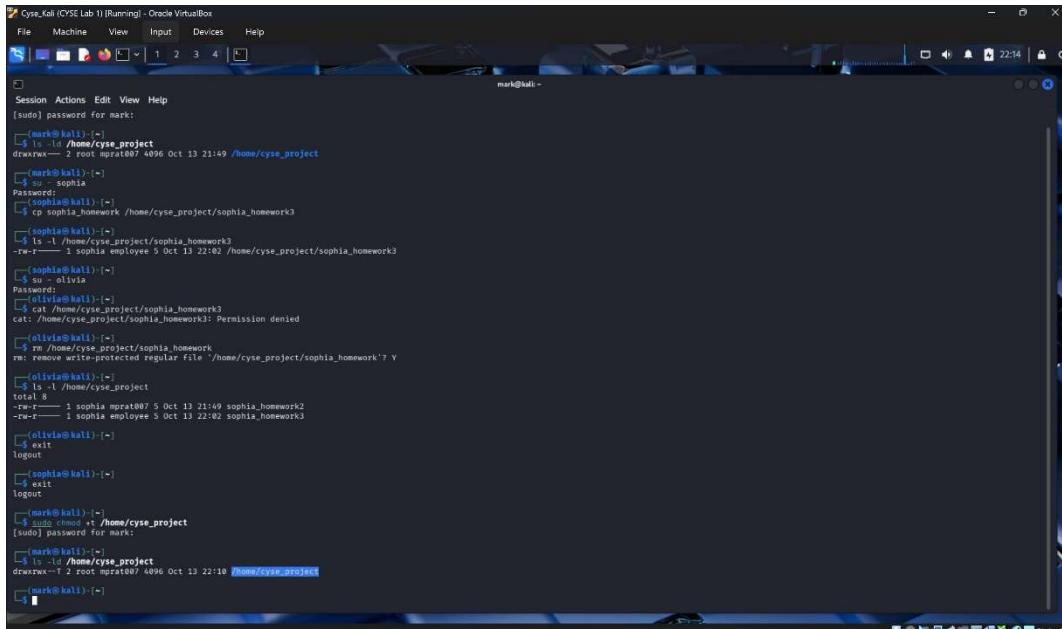
Task D Step 1 - Switch to Olivia's account. Delete "Sophia_homework" in the /home/cyse_project directory.



```
Session Actions Edit View Help
[mark@kali:~] -> [sudo] chmod g+ /home/cyse_project
[sudo] password for mark:
[mark@kali:~] -> ls -ld /home/cyse_project
drwxrwx--- 2 root mpreat07 4096 Oct 13 21:49 /home/cyse_project
[mark@kali:~] -> ./sophia
Password:
[sophia@kali:~] -> cp sophia_homework /home/cyse_project/sophia_homework3
[sophia@kali:~] -> ls -l /home/cyse_project/sophia_homework3
-rw-r--r-- 1 sophia mpreat07 5 Oct 13 22:02 /home/cyse_project/sophia_homework3
[sophia@kali:~] -> ./olivia
Password:
[olivia@kali:~] -> cp sophia_homework /home/cyse_project/sophia_homework3
cat: /home/cyse_project/sophia_homework3: Permission denied
[olivia@kali:~] -> rm /home/cyse_project/sophia_homework
rm: remove write-protected regular file '/home/cyse_project/sophia_homework'? y
[olivia@kali:~] -> ls -l /home/cyse_project
total 8
-rw-r--r-- 1 sophia mpreat07 5 Oct 13 21:49 sophia_homework2
-rw-r--r-- 1 sophia employee 5 Oct 13 22:02 sophia_homework3
[olivia@kali:~]
```

deleted Sophia_homework using rm /home/cyse_project/shopia_homework file successfully deleted group allows write permissions.

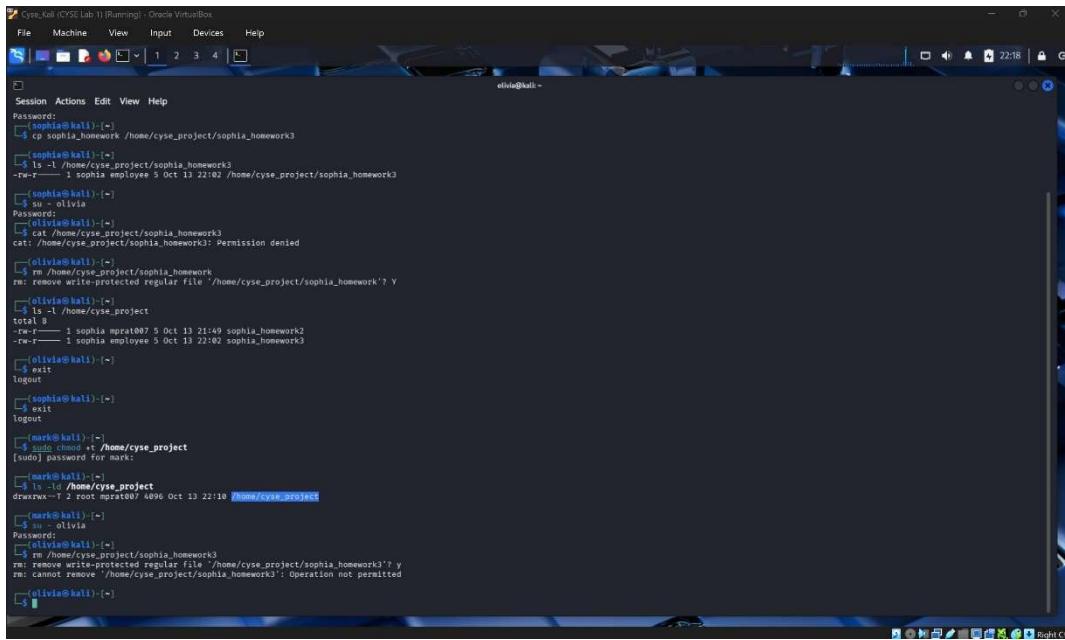
Step 2 - Switch to root account. Set the sticky bit permission, to make files can only be removed by the owner of the file.



```
Session Actions Edit View Help
[sudo] password for mark:
[mark@kali:~] -> /home/cyse_project
drwxrwx--- 2 root mpreat07 4096 Oct 13 21:49 /home/cyse_project
[mark@kali:~] -> ./sophia
Password:
[sophia@kali:~] -> cp sophia_homework /home/cyse_project/sophia_homework3
[sophia@kali:~] -> ls -l /home/cyse_project/sophia_homework3
-rw-r--r-- 1 sophia employee 5 Oct 13 22:02 /home/cyse_project/sophia_homework3
[sophia@kali:~] -> ./olivia
Password:
[olivia@kali:~] -> cp sophia_homework /home/cyse_project/sophia_homework3
cat: /home/cyse_project/sophia_homework3: Permission denied
[olivia@kali:~] -> rm /home/cyse_project/sophia_homework
rm: remove write-protected regular file '/home/cyse_project/sophia_homework'? y
[olivia@kali:~] -> ls -l /home/cyse_project
total 8
-rw-r--r-- 1 sophia mpreat07 5 Oct 13 21:49 sophia_homework2
-rw-r--r-- 1 sophia employee 5 Oct 13 22:02 sophia_homework3
[olivia@kali:~] -> exit
logout
[sophia@kali:~] -> exit
logout
[mark@kali:~] -> sudo chmod +t /home/cyse_project
[sudo] password for mark:
[mark@kali:~] -> ls -ld /home/cyse_project
drwxrwx---T 2 root mpreat07 4096 Oct 13 22:10 /home/cyse_project
[mark@kali:~]
```

used sudo chmod +t /home/cyse_project using sticky bit t director chmod +t dir so only owner can delete.

Step 3 - Switch to Olivia's account. Try to delete "Sophia_homework3" in the /home/cyse_project directory. Can you delete it this time? Why?



```
File Machine View Input Devices Help
Session Actions Edit View Help
Password:
[sophia@kali] ~]
$ cd sophia_homework /home/cyse_project/sophia_homework3
[sophia@kali] ~]
$ ls -l /home/cyse_project/sophia_homework3
-rw-r--r-- 1 sophia employee 5 Oct 13 22:02 /home/cyse_project/sophia_homework3
[sophia@kali] ~]
$ cd ..
[sophia@kali] ~]
$ cd olivia
Password:
[olivia@kali] ~]
$ cat /home/cyse_project/sophia_homework3
cat: /home/cyse_project/sophia_homework3: Permission denied
[olivia@kali] ~]
$ rm /home/cyse_project/sophia_homework3
rm: remove write-protected regular file '/home/cyse_project/sophia_homework3'? y
[olivia@kali] ~]
$ ls -l /home/cyse_project
total 8
-rw-r--r-- 1 sophia mpratek 5 Oct 13 21:49 sophia_homework2
-rw-r--r-- 1 sophia employee 5 Oct 13 22:02 sophia_homework3
[olivia@kali] ~]
$ exit
logout
[sophia@kali] ~]
$ exit
logout
[mark@kali] ~]
$ sudo chmod +t /home/cyse_project
[sudo] password for mark:
[mark@kali] ~]
$ ls -l /home/cyse_project
drwxr-x--- 2 root mpratek 4096 Oct 13 22:10 /home/cyse_project
[mark@kali] ~]
$ su -l olivia
Password:
[olivia@kali] ~]
$ 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@kali] ~]
```

switched to olivia's account using su – Olivia, used rm /home/cyse_project/Sophia_homework3 to attempt to delete the file. Permission denied because sticky bit prevents deletion to owner which is Sophia or root.