

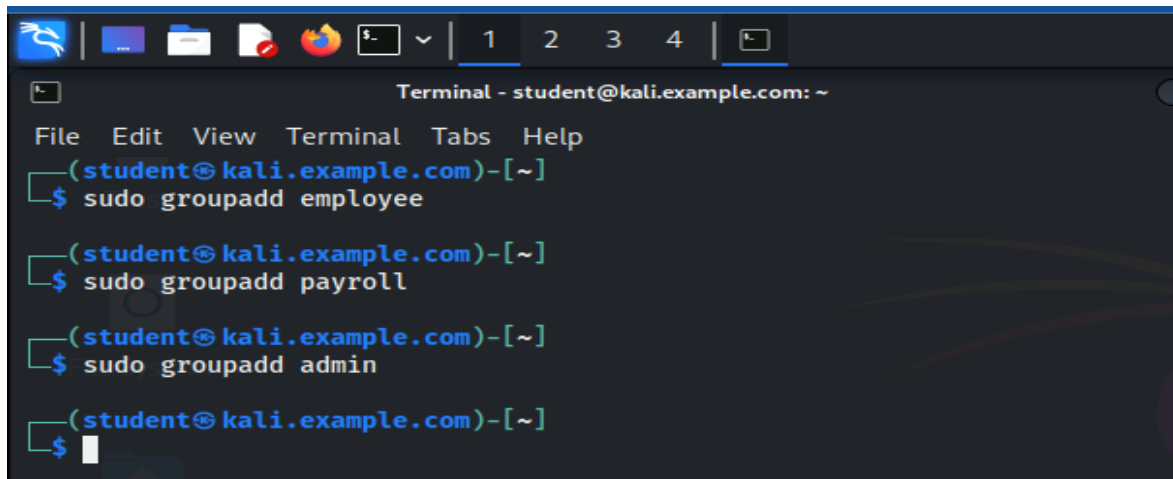
CYSE 270: Linux System for Cybersecurity

You need to configure the system to allow three users to perform the shared folder actions. Please submit the screenshot for all the steps in a word or pdf file

Task A: Get accounts and groups ready (70 points)

Step 1. Create three groups- employee, payroll, and admin. (You may refer to the slides for week-4 –Group Management)

Command used: `sudo groupadd employee`
`sudo groupadd payroll`
`sudo groupadd admin`



```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help
(student@kali.example.com)-[~]
$ sudo groupadd employee
(student@kali.example.com)-[~]
$ sudo groupadd payroll
(student@kali.example.com)-[~]
$ sudo groupadd admin
(student@kali.example.com)-[~]
$
```

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.

Step 1: Created 3 user accounts with a specified home directory using the following commands for each user.

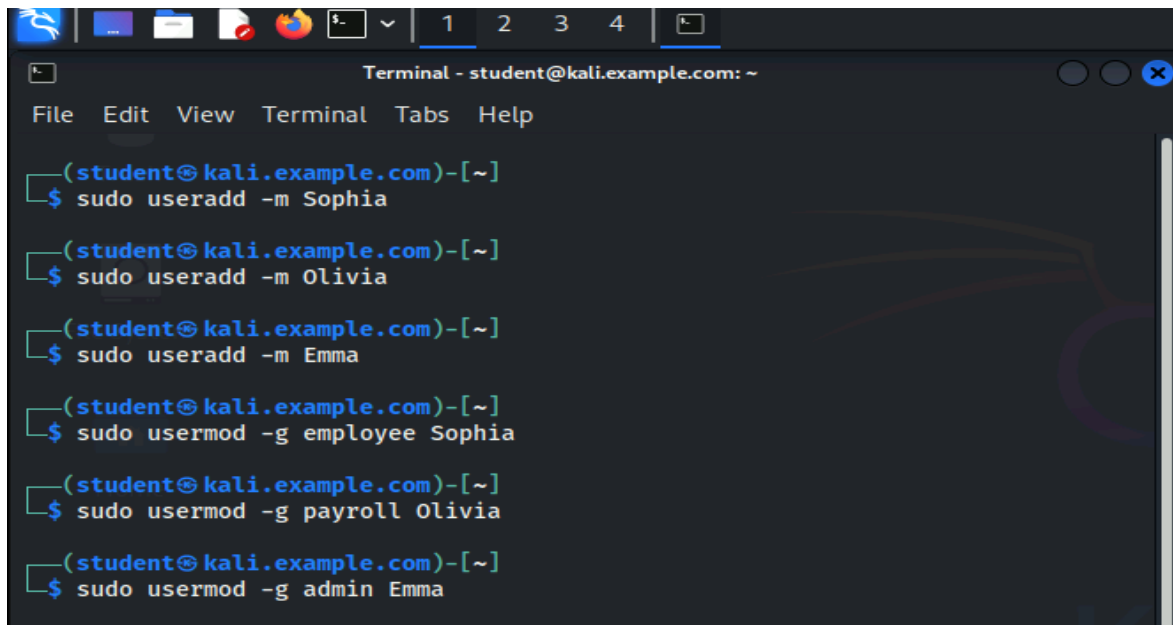
`sudo useradd -m Sophia`
`sudo useradd -m Olivia`
`sudo useradd -m Emma`

Step 2: Set the primary group for Sophia, Olivia and Emma to "employee", "payroll", and "admin", respectively. Command used:

```
sudo usermod -g employee Sophia
```

```
sudo usermod -g payroll Olivia
```

```
sudo usermod -g admin Emma
```



```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
$ sudo useradd -m Sophia

(student@kali.example.com)-[~]
$ sudo useradd -m Olivia

(student@kali.example.com)-[~]
$ sudo useradd -m Emma

(student@kali.example.com)-[~]
$ sudo usermod -g employee Sophia

(student@kali.example.com)-[~]
$ sudo usermod -g payroll Olivia

(student@kali.example.com)-[~]
$ sudo usermod -g admin Emma
```

Step3: Changed their login shell to /bin/bash using the following commands:

```
sudo usermod -s /bin/bash Sophia
```

```
sudo usermod -s /bin/bash Olivia
```

```
sudo usermod -s /bin/bash Emma
```

Step4: Set their passwords using the following commands:

```
sudo passwd Sophia
```

```
sudo passwd Olivia
```

```
sudo passwd Emma
```

```
File Edit View Terminal Tabs Help
└─$ sudo usermod -s /bin/bash Sophia
└─(student@kali.example.com)-[~]
└─$ sudo usermod -s /bin/bash Olivia
└─(student@kali.example.com)-[~]
└─$ sudo usermod -s /bin/bash Emma
└─(student@kali.example.com)-[~]
└─$ sudo passwd Sophia
New password:
Retype new password:
passwd: password updated successfully
└─(student@kali.example.com)-[~]
└─$ sudo passwd Olivia
New password:
Retype new password:
passwd: password updated successfully
└─(student@kali.example.com)-[~]
└─$ sudo passwd Emma
New password:
Retype new password:
passwd: password updated successfully
└─(student@kali.example.com)-[~]
```

Step 3. Create a shared group called "your_midas" (replace it with your MIDAS name) and set this shared group as the above accounts' secondary group. After this step, remember to check each user's group profile.

Step1: Created a shared group named, rchak003 using command:

```
sudo groupadd rchak003
```

Step2: Added Sophia, Olivia and Emma in the shared group, rchak003 using the following command:

```
sudo usermod -aG rchak003 Sophia
```

```
sudo usermod -aG rchak003 Olivia
```

```
sudo usermod -aG rchak003 Emma
```

Step3: Checked each user's group profile using the following commands:

```
groups Sophia
```

```
groups Olivia
```

```
groups Emma
```

```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
$ sudo groupadd rchak003

(student@kali.example.com)-[~]
$ sudo usermod -aG rchak003 Sophia

(student@kali.example.com)-[~]
$ sudo usermod -aG rchak003 Olivia

(student@kali.example.com)-[~]
$ sudo usermod -aG rchak003 Emma

(student@kali.example.com)-[~]
$
```

```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
$ groups Sophia
Sophia : employee rchak003

(student@kali.example.com)-[~]
$ groups Olivia
Olivia : payroll rchak003

(student@kali.example.com)-[~]
$ groups Emma
Emma : admin rchak003

(student@kali.example.com)-[~]
$
```

Step 4. Create a directory named `/home/cyse_project`, which is to be owned by the “your_midas” group which is a shared group). After this step, remember to check the permission of this shared directory.

Step1: Created a directory `/home/cyse_project` using the following command:

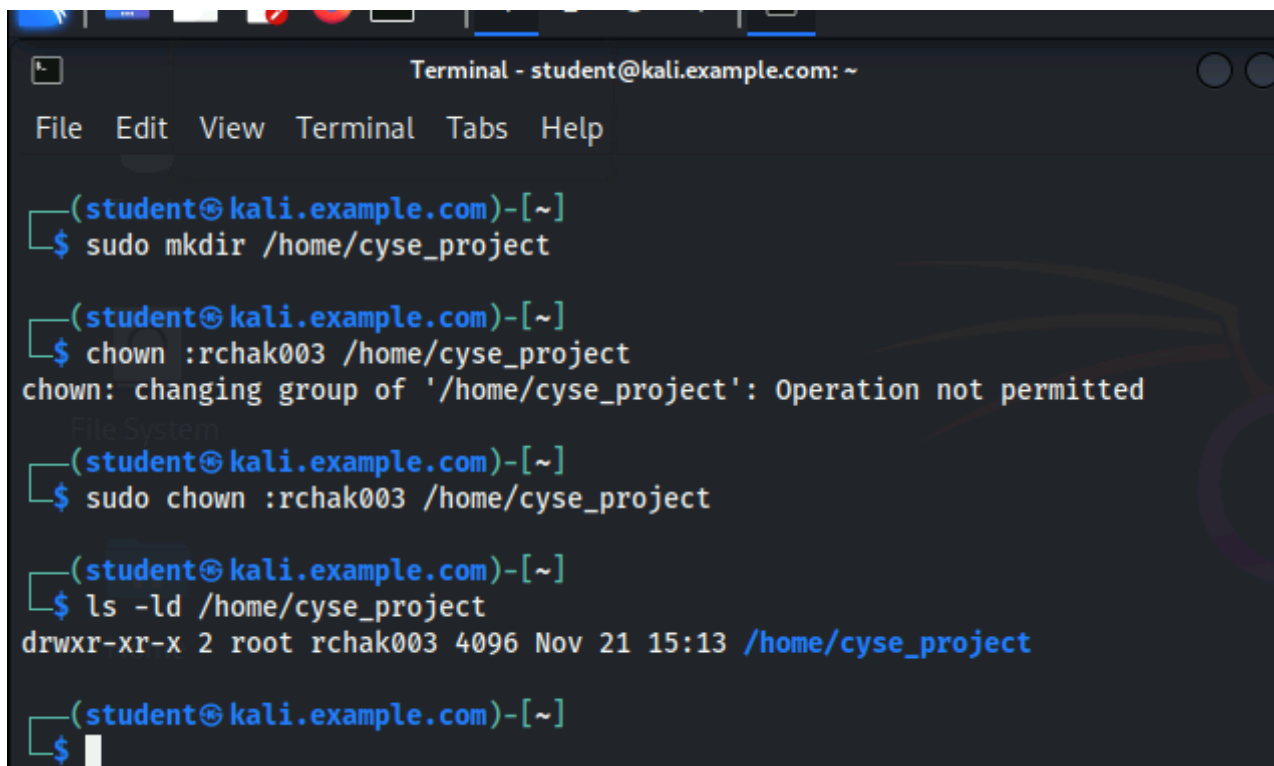
```
sudo mkdir /home/cyse_project
```

Step2: Changed the ownership of the directory to the shared group, `rchak003` using the following command:

```
sudo chown :rchak003 /home/cyse_project
```

Step3: Checked the permission of the directory using the following command:

```
ls -ld /home/cyse_project
```



```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
└─$ sudo mkdir /home/cyse_project

(student@kali.example.com)-[~]
└─$ chown :rchak003 /home/cyse_project
chown: changing group of '/home/cyse_project': Operation not permitted

(student@kali.example.com)-[~]
└─$ sudo chown :rchak003 /home/cyse_project

(student@kali.example.com)-[~]
└─$ ls -ld /home/cyse_project
drwxr-xr-x 2 root rchak003 4096 Nov 21 15:13 /home/cyse_project

(student@kali.example.com)-[~]
└─$
```

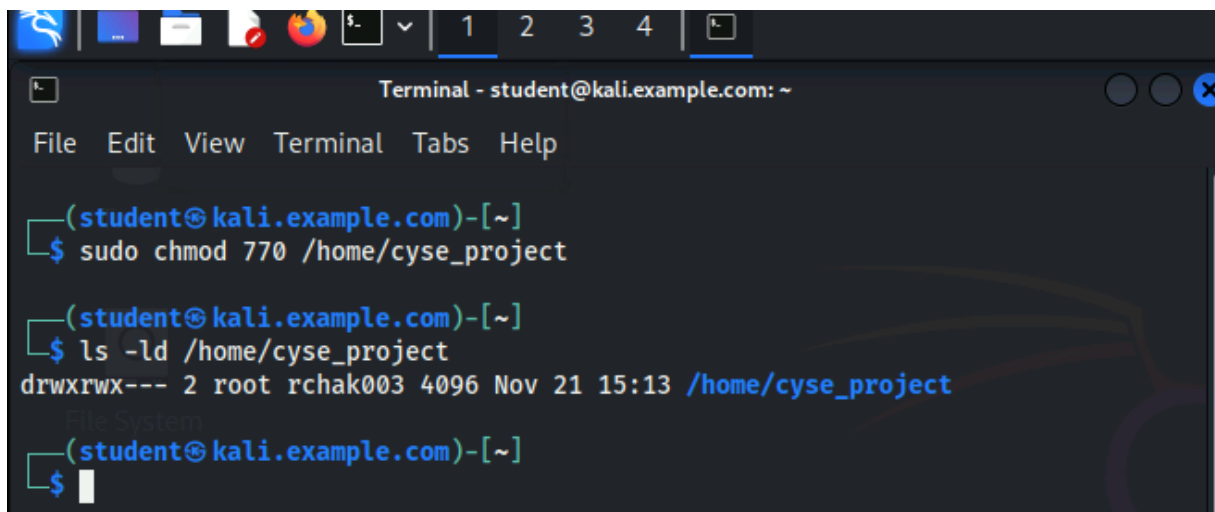
Step 5. Change the permissions of the /home/cyse_project directory to "rwxrwx---" using the octal method so that only the project group members have access to this directory. After this step, remember to check the permission of this shared directory.

Step1: Changed the permission of the /home/cyse_project directory to "rwxrwx---" using the octal method. Command used:

```
sudo chmod 770 /home/cyse_project
```

Step2: Checked the permission of the shared directory using the following command:

```
ls -ld /home/cyse_project
```



```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help
(student@kali.example.com)-[~]
$ sudo chmod 770 /home/cyse_project
(student@kali.example.com)-[~]
$ ls -ld /home/cyse_project
drwxrwx--- 2 root rchak003 4096 Nov 21 15:13 /home/cyse_project
(student@kali.example.com)-[~]
$
```

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.

Step1: Switched to Sophia's account using the following command:

```
su Sophia
```

Step2: Changed the default permission to "rw-r-----" using octal method with the following umask command:

```
umask 0027
```

Step3: Created a new file named, testFile.txt using the following command:

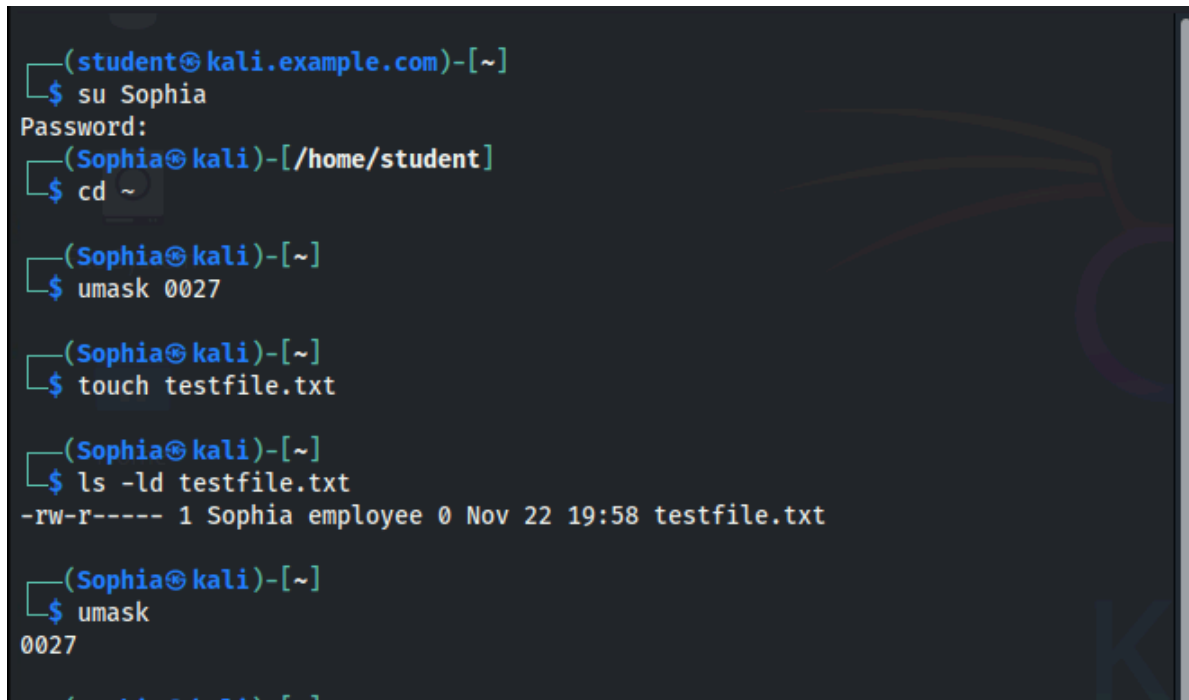
```
touch testfile.txt
```

Step4: Checked the permission of the new file using the following command:

```
ls -ld testfile.txt
```

Step5: Checked the value of umask using the following command:

```
umask
```



```
(student@kali.example.com)-[~]
└─$ su Sophia
Password:
(Sophia@kali)-[~/home/student]
└─$ cd ~

(Sophia@kali)-[~]
└─$ umask 0027

(Sophia@kali)-[~]
└─$ touch testfile.txt

(Sophia@kali)-[~]
└─$ ls -ld testfile.txt
-rw-r----- 1 Sophia employee 0 Nov 22 19:58 testfile.txt

(Sophia@kali)-[~]
└─$ umask
0027
```

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)

Step1: Created a new file, "Sophia_homework" in the home directory of Sophia using the following command:

```
touch Sophia_homework
```

Step2: Put my name in the file as content using VI editor

```
vi Sophia_homework
```

Step3: Checked the content of the file using the following command:

```
cat Sophia_homework
```

Step4: Checked the permission of the file using the following command:

```
ls -ld Sophia_homework
```

```
File Edit View Terminal Tabs Help

(Sophia@kali)-[~]
└─$ touch Sophia_homework

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

(Sophia@kali)-[~]
└─$ cat Sophia_homework
Reema

(Sophia@kali)-[~]
└─$ ls -ld Sophia_homework
-rw-r----- 1 Sophia employee 6 Nov 21 16:58 Sophia_homework

(Sophia@kali)-[~]
└─$
```

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.

Step1: Copied "Sophia_homework" to the /home/cyse_project directory using the following command:

```
cp Sophia_homework /home/cyse_project
```

Step2: Changed directory to /home/cyse_project directory using the following command:

```
cd /home/cyse_project
```

Step3: Checked the permission of the file Sophia_homework using the following command:

```
ls -ld Sophia_homework
```

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

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

(Sophia@kali)-[/home/cyse_project]
└─$ ls
Sophia_homework

(Sophia@kali)-[/home/cyse_project]
└─$ ls -ld Sophia_homework
-rw-r----- 1 Sophia employee 6 Nov 21 17:16 Sophia_homework
```

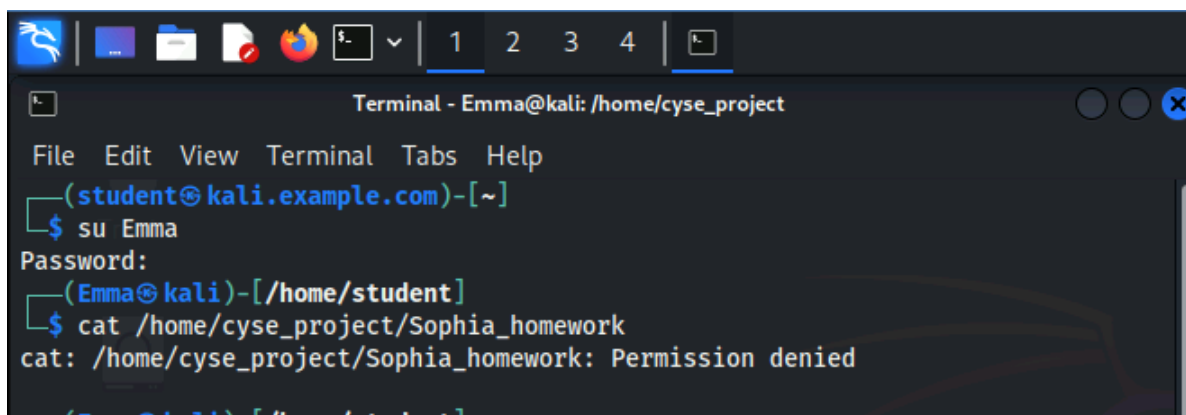
Step 9. Switch to Emma's account. Try to read "Sophia_homework" in the /home/cyse_project Directory.

Step1: Switched to Emma's account using the following command:

```
su Emma
```

Step2: Tried to read the file "Sophia_homework" in the /home/cyse_project directory using the following command:

```
cat Sophia_homework
```



```
Terminal - Emma@kali: /home/cyse_project
File Edit View Terminal Tabs Help
└─(student@kali.example.com)-[~]
└─$ su Emma
Password:
└─(Emma@kali)-[/home/student]
└─$ cat /home/cyse_project/Sophia_homework
cat: /home/cyse_project/Sophia_homework: Permission denied
└─(Emma@kali)-[/home/student]
```

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

Exited from both Emma's account and Sophia's account with `exit` command.

```
(Emma@kali)-[~/home/cyse_project]
└─$ exit
exit

(Sophia@kali)-[~/home/cyse_project]
└─$ exit
exit

(student@kali.example.com)-[~]
└─$
```

Task B: Set SGID permission (15 points)

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.

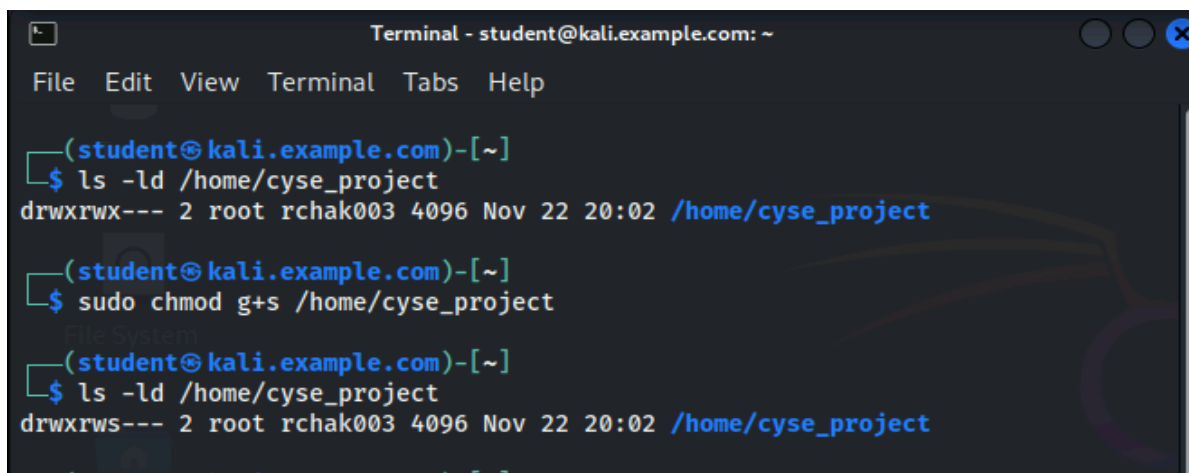
Step1: Switched to the root account by exiting out from both accounts.

Step2: Allowed group members to access the files shared in the shared directory by using the following command:

```
sudo chmod g+s /home/cyse_project
```

Step3: Verified permission by using command:

```
ls -ld
```



```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
└─$ ls -ld /home/cyse_project
drwxrwx--- 2 root rchak003 4096 Nov 22 20:02 /home/cyse_project

(student@kali.example.com)-[~]
└─$ sudo chmod g+s /home/cyse_project

(student@kali.example.com)-[~]
└─$ ls -ld /home/cyse_project
drwxrws--- 2 root rchak003 4096 Nov 22 20:02 /home/cyse_project
```

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

Step1: Switched to Sophia's account using the following command:

```
su Sophia
```

Step2: Copied the "Sophia_homework" to the /home/cyse_project directory as "Sophia_homework2" using the following command:

```
cd /home/cyse_project
```

```
cp Sophia_homework /home/cyse_project/Sophia_homework2
```

Step3: Verified the same using the following commands:

```
ls
```

```
(student@kali.example.com)-[~]
└─$ su Sophia
Password:
└─(Sophia@kali)-[/home/student]
└─$ cd /home/cyse_project

└─(Sophia@kali)-[/home/cyse_project]
└─$ ls
Sophia_homework

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

└─(Sophia@kali)-[/home/cyse_project]
└─$ ls
Sophia_homework  Sophia_homework2
```

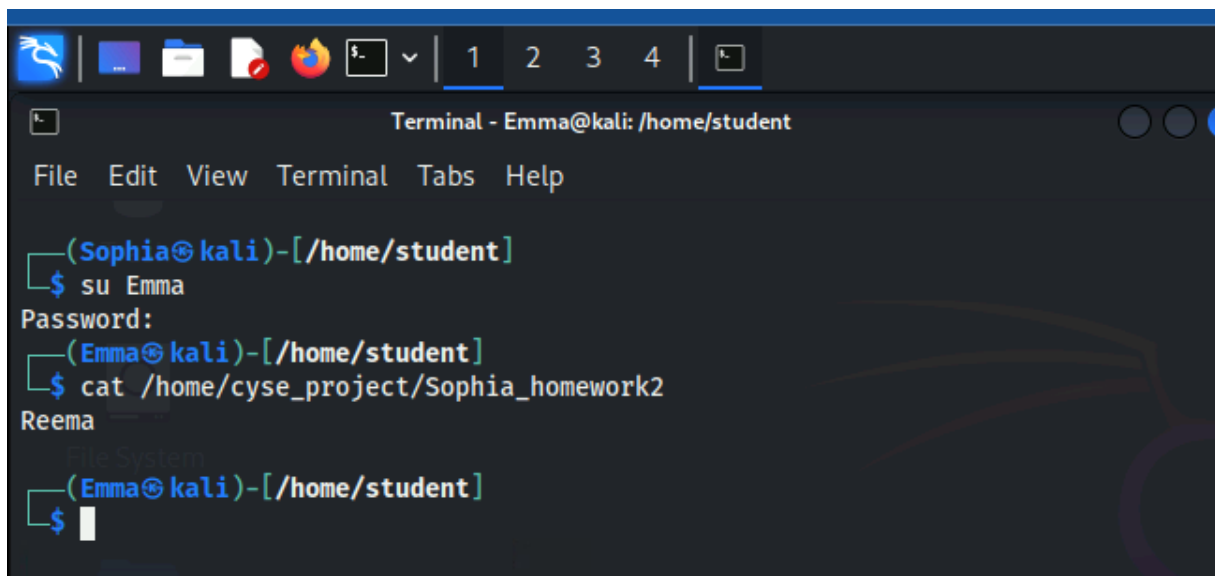
Step 3. Switch to Emma's account. Try to read "Sophia_homework2" in the /home/cyse_project directory.

Step1: Switched to Emma's account using the following command:

```
su Emma
```

Step2: Tried to read "Sophia_homework2" in the /home/cyse_project directory using the following command:

```
cat /home/cyse_project/Sophia_homework2
```



```
Terminal - Emma@kali: /home/student
File Edit View Terminal Tabs Help
(Sophia@kali)-[/home/student]
└─$ su Emma
Password:
(Emma@kali)-[/home/student]
└─$ cat /home/cyse_project/Sophia_homework2
Reema
(Emma@kali)-[/home/student]
└─$
```

Task C: Unset SGID permissions (15 points)

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.

Step1: Switched to regular user's account using exit command.

Step2: Disallowed the group members to access the files in the shared folder using the following command:

```
sudo chmod g-s /home/cyse_project
```

Step3: Verified the permission using the command:

```
ls -ld /home/cyse_project
```

```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
$ sudo chmod g-s /home/cyse_project

(student@kali.example.com)-[~]
$ ls -ld /home/cyse_project
drwxrwx--- 2 root rchak003 4096 Nov 22 20:19 /home/cyse_project

(student@kali.example.com)-[~]
$
```

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

Step1: Switched to Sophia's account using the command:

```
su Sophia
```

Step2: Changed directory to /home/cyse_project using the command:

```
cd /home/cyse_project
```

Step3: Copied "Sophia_homework" as "Sophia_homework3 in the current directory using the command:

```
cp Sophia_homework /home/cyse_project/Sophia_homework3
```

```
(student@kali.example.com)-[~]
$ su Sophia
Password:
(Sophia@kali)-[/home/student]
$ cd /home/cyse_project

(Sophia@kali)-[/home/cyse_project]
$ cp Sophia_homework /home/cyse_project/Sophia_homework3

(Sophia@kali)-[/home/cyse_project]
$ ls
Sophia_homework  Sophia_homework2  Sophia_homework3
```

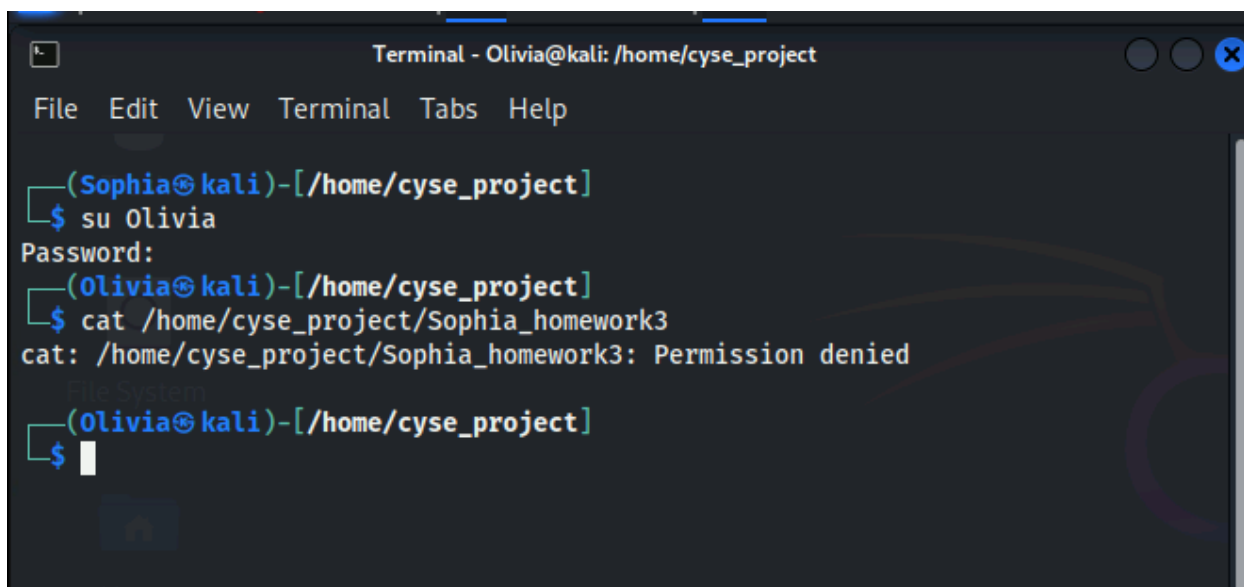
Step 3. Switch to Olivia's account. Try to read "Sophia_homework3" in the /home/cyse_project directory.

Step1: Switched to Olivia's account using the command:

```
su Olivia
```

Step2: Tried to read "Sophia_homework3" in the /home/cyse_project directory using the command:

```
cat /home/cyse_project/Sophia_homework3
```



```
Terminal - Olivia@kali: /home/cyse_project
File Edit View Terminal Tabs Help
(Sophia@kali)-[/home/cyse_project]
└─$ su Olivia
Password:
(Olivia@kali)-[/home/cyse_project]
└─$ cat /home/cyse_project/Sophia_homework3
cat: /home/cyse_project/Sophia_homework3: Permission denied
(Olivia@kali)-[/home/cyse_project]
└─$
```

Extra credit: Sticky Bit (10 points)

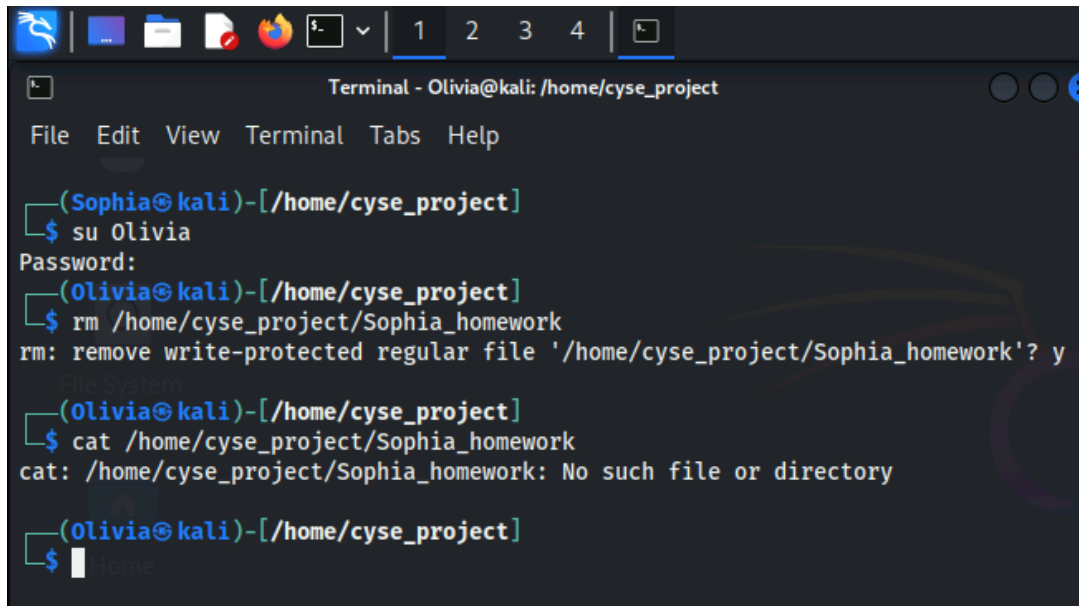
Step 1. Switch to Olivia' account. Delete "Sophia_homework" in the /home/cyse_project directory.

Step1: Switched to Olivia's account using the command:

```
su Olivia
```

Step2: Deleted the "Sophia_homework" in the /home/cyse_project directory using the command:

```
rm /home/cyse_project/Sophia_homework
```

A terminal window titled "Terminal - Olivia@kali: /home/cyse_project". The prompt is "(Sophia@kali)-[/home/cyse_project]". The user enters "\$ su Olivia". The prompt changes to "(Olivia@kali)-[/home/cyse_project]". The user enters "\$ rm /home/cyse_project/Sophia_homework". The terminal shows the output: "rm: remove write-protected regular file '/home/cyse_project/Sophia_homework'? y". The user enters "\$ cat /home/cyse_project/Sophia_homework". The terminal shows the output: "cat: /home/cyse_project/Sophia_homework: No such file or directory". The user enters "\$ cd /home".

```
Terminal - Olivia@kali: /home/cyse_project
File Edit View Terminal Tabs Help

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

(Olivia@kali)-[/home/cyse_project]
└─$ cat /home/cyse_project/Sophia_homework
cat: /home/cyse_project/Sophia_homework: No such file or directory

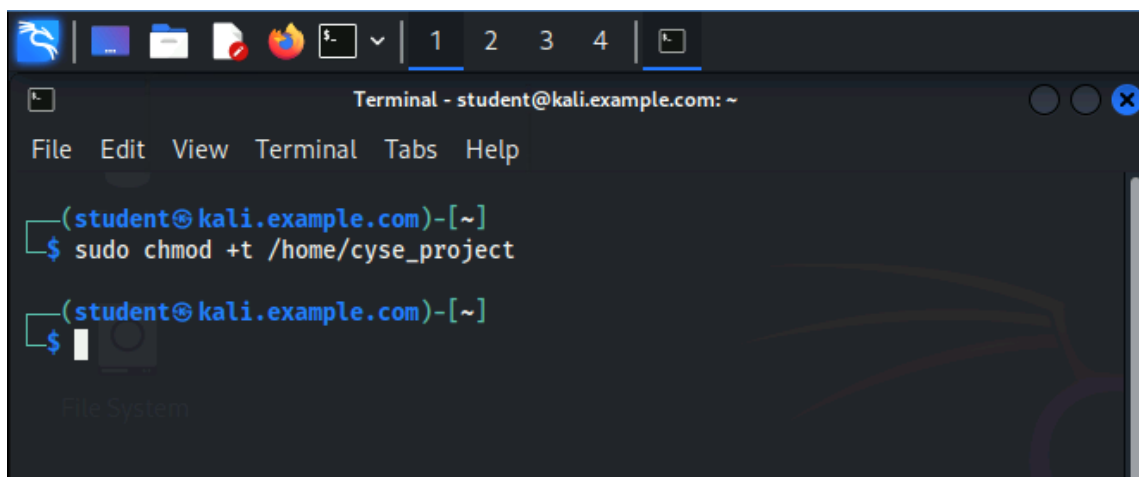
(Olivia@kali)-[/home/cyse_project]
└─$ cd /home
```

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

Step1: Switched to root account using exit command.

Step2: Set the sticky bit permission to make files can only be removed by the owner of the file. Command used:

sudo chmod +t /home/cyse_project

A terminal window titled "Terminal - student@kali.example.com: ~". The prompt is "(student@kali.example.com)-[~]". The user enters "\$ sudo chmod +t /home/cyse_project". The terminal shows the output: "File System".

```
Terminal - student@kali.example.com: ~
File Edit View Terminal Tabs Help

(student@kali.example.com)-[~]
└─$ sudo chmod +t /home/cyse_project

(student@kali.example.com)-[~]
└─$
```

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

Step1: Switched to Olivia's account using the command:

```
su Olivia
```

Step2: Tried to delete "Sophia_homework3" in the /home/cyse_project directory.

```
(student@kali.example.com)-[~]
└─$ su Olivia
Password:
└─(Olivia@kali)-[/home/student]
└─$ 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)-[/home/student]
└─$
```

Note: No, I was not able to delete this time because in the previous step, I set the sticky bit permission which allows only the owner of the file to delete or remove.