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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

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Chandubhai S. Patel Institute of Technology

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Date: 28/12/24

Practical 2

Academic Year	:	2023-24	Semester	:	4th
Course code	:	CSE208	Course name	:	Operating System

Perform Linux Commands for the following

Practical 2: Managing Users, Groups, and Permissions in Linux
Scenario: Setting Up and Managing a Team for a Group Project

As a system administrator for a team of 4th-semester CSE students working on a group project, you need to create and manage user accounts, groups, and permissions to ensure proper collaboration and security. Follow the steps below to complete the tasks.

❖ **Part (i): Create, Delete, and Manage Groups**

- Create a group named ProjectTeam

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo groupadd ProjectTeam
```

- Create additional groups for different roles, such as Developers and Testers

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo groupadd Developers
23cs070@67bc815312a7dc36e52dba7d:~$ sudo groupadd Testers
```

- List all groups on the system to verify their creation.

```
plugdev
staff
games
users
nogroup
systemd-journal
systemd-network
systemd-resolve
_ssh
input
sgx
kvm
render
messagebus
systemd-timesync
tcpdump
rdma
rtkit
avahi
netdev
scanner
saned
colord
pulse
pulse-access
ssl-cert
labex
public
mysql
mongodb
redis
23cs070
ProjectTeam
Developers
Testers
23cs070@67bc815312a7dc36e52dba7d:~$
```

- Add users student1, student2, student3, and student4 to the ProjectTeam group.

```
23cs070@67bc815312a7dc36e52dba7d:~$ cat /etc/passwd | grep student1
23cs070@67bc815312a7dc36e52dba7d:~$ sudo useradd -m student1
23cs070@67bc815312a7dc36e52dba7d:~$ sudo passwd student1
New password:
Retype new password:
passwd: password updated successfully
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG ProjectTeam student1
```

```
23cs070@67bc815312a7dc36e52dba7d:~$ cat /etc/passwd | grep student2
23cs070@67bc815312a7dc36e52dba7d:~$ sudo useradd -m student2
23cs070@67bc815312a7dc36e52dba7d:~$ sudo passwd student2
New password:
Retype new password:
passwd: password updated successfully
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG ProjectTeam student2
```

```
23cs070@67bc815312a7dc36e52dba7d:~$ cat /etc/passwd | grep student3
23cs070@67bc815312a7dc36e52dba7d:~$ sudo useradd -m student3
23cs070@67bc815312a7dc36e52dba7d:~$ sudo passwd student3
New password:
Retype new password:
passwd: password updated successfully
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG ProjectTeam student3
```

```
23cs070@67bc815312a7dc36e52dba7d:~$ cat /etc/passwd | grep student4
23cs070@67bc815312a7dc36e52dba7d:~$ sudo useradd -m student4
23cs070@67bc815312a7dc36e52dba7d:~$ sudo passwd student4
New password:
Retype new password:
passwd: password updated successfully
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG ProjectTeam student4
```

- Add student1 and student2 to the Developers group, and student3 and student4 to the Testers group.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG Developers student1
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG Developers student2
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG Testers student3
23cs070@67bc815312a7dc36e52dba7d:~$ sudo usermod -aG Testers student4
```

- Delete the Testers group if it's no longer needed.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo groupdel Testers
```

- Verify the groups a user belongs to

```
23cs070@67bc815312a7dc36e52dba7d:~$ groups student1
student1 : student1 ProjectTeam Developers
23cs070@67bc815312a7dc36e52dba7d:~$ id student1
uid=5002(student1) gid=5006(student1) groups=5006(student1),5003(ProjectTeam),5004(Developers)
```

❖ **Part (ii): Manage Directory and File Permissions**

- Create a shared directory named ProjectFiles.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo mkdir /ProjectFiles
```

- Change the group ownership of the directory to ProjectTeam.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo chown :ProjectTeam /ProjectFiles
```

- Set permissions so that only members of the ProjectTeam group can read, write, and execute files in the directory.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo chmod 770 /ProjectFiles
```

- Create a file named requirements.txt inside the ProjectFiles directory.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo touch /ProjectFiles/requirements.txt
```

- Set permissions for the requirements.txt file so that only the file owner can modify it, but others in the group can read it.

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo chmod 640 /ProjectFiles/requirements.txt
```

- Verify the permissions of the directory and the file.

```
23cs070@67bc815312a7dc36e52dba7d:~$ ls -ld /ProjectFiles
drwxrwx--- 2 root ProjectTeam 30 Feb 24 23:01 /ProjectFiles
```

- Test access by switching to a user in the ProjectTeam group and trying to read and write to the file.

```
23cs070@67bc815312a7dc36e52dba7d:~$ ls -l /ProjectFiles/requirements.txt
ls: cannot access '/ProjectFiles/requirements.txt': Permission denied
```

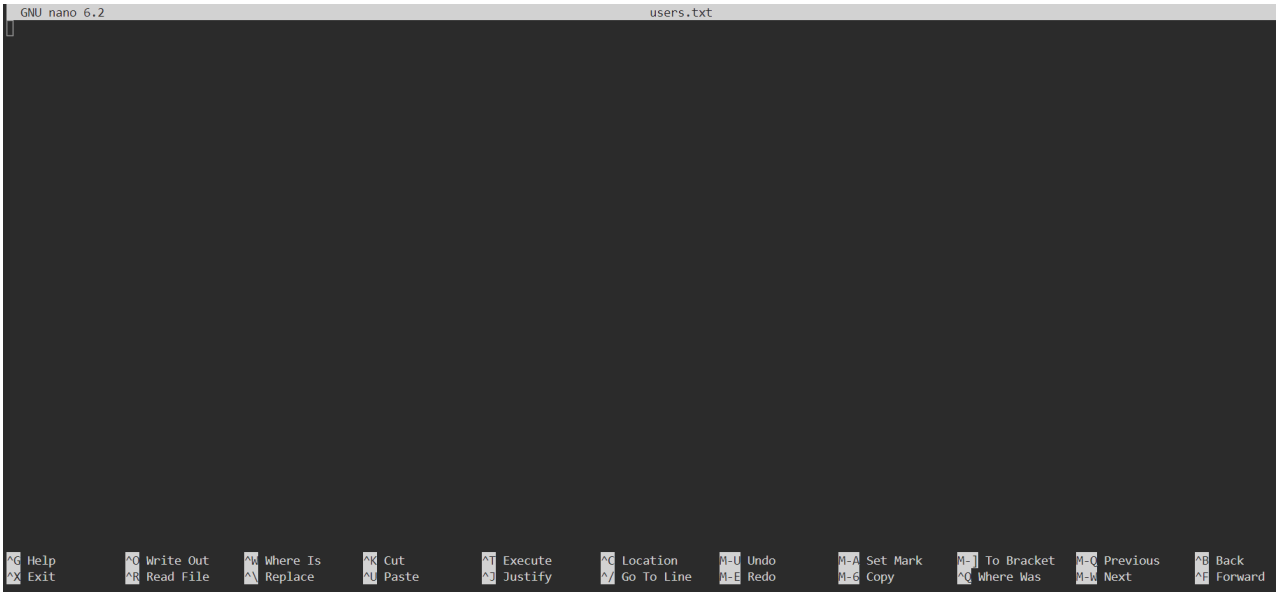
```
23cs070@67bc815312a7dc36e52dba7d:~$ su - student1
Password:
student1@67bc815312a7dc36e52dba7d:~$ cat /ProjectFiles/requirements.txt
cat: /ProjectFiles/requirements.txt: Permission denied
```

```
student1@67bc815312a7dc36e52dba7d:~$ echo "New Requirement" >> /ProjectFiles/requirements.txt
-sh: /ProjectFiles/requirements.txt: Permission denied
```

❖ **Part (iii): Add Users in Bulk**

- Create a text file named users.txt containing usernames of new students, one per line.

```
23cs070@67bc815312a7dc36e52dba7d:~$ nano users.txt
```



- Write a script to add these users in bulk.

```
23cs070@67bc815312a7dc36e52dba7d:~$ nano add_users.sh
```

```
23cs070@67bc815312a7dc36e52dba7d:~$ chmod +x add_users.sh
```

- Run the script to add users.74

```
23cs070@67bc815312a7dc36e52dba7d:~$ sudo ./add_users.sh
useradd: user 'student1' already exists
User student1 added successfully!
useradd: user 'student2' already exists
User student2 added successfully!
useradd: user 'student3' already exists
User student3 added successfully!
User student70 added successfully!
```

- Verify that the users were added.

```
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
_apt
systemd-network
systemd-resolve
messagebus
systemd-timesync
tcpdump
sshd
usbmux
rtkit
avahi
saned
colord
pulse
labex
mysql
mongodb
redis
23cs070
student1
student2
student3
student4
student70
23cs070@67bc815312a7dc36e52dba7d:~$
```

```
23cs070@67bc815312a7dc36e52dba7d:~$ cat users.txt
student1
student2
student3
student70
```

- Set a default password for all new users.

```
23cs070@67bc815312a7dc36e52dba7d:~$ cat add_users.sh
#!/bin/bash

# Loop through each line in users.txt and create users
while IFS= read -r user
do
    sudo useradd -m -s /bin/bash "$user"  # Create user with home directory
    echo "$user:DefaultPassword" | sudo chpasswd  # Set default password
    echo "User $user added successfully!"
done < users.txt
```