POC Task 1

Task 1: Linux Essentials & File Permissions

1. Executive Summary

This Proof of Concept (PoC) validated the creation of a Linux user, directory structure, and file permissions management. The task involved setting up a secure environment for `studentuser`, configuring restricted file access, and automating file backups via a shell script. The PoC succeeded after resolving permission conflicts, demonstrating proper Linux user and file management.

2. Objectives

- Create a new user (`studentuser`) and assign a home directory.
- Build a directory structure under `/home/studentuser/projectX`.
- Create a file (`welcome.txt`) with restricted permissions (read/write for owner only).
- Develop a backup script (`backup.sh`) to copy files to a `logs` directory.
- Troubleshoot permission issues to ensure script functionality.

3. Steps

1. User Creation

```
┌──(llamafart㉿jaivanti)-[~]
└─$ sudo adduser studentuser
[sudo] password for llamafart:
info: Adding user `studentuser' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group `studentuser' (1001) ...
info: Adding new user `studentuser' (1001) with group `studentuser (1001)' ...
info: Creating home directory `/home/studentuser' ...
info: Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
```

2. Directory Structure Setup

```
┌──(llamafart㉿jaivanti)-[~]
└─$ sudo mkdir -p /home/studentuser/projectX/logs

┌──(llamafart㉿jaivanti)-[~]
└─$ sudo mkdir -p /home/studentuser/projectX/scripts

┌──(llamafart㉿jaivanti)-[~]
└─$ sudo chown -R studentuser:studentuser /home/studentuser/projectX
```

3. File Creation & Permissions

```
┌──(llamafart㉿jaivanti)-[~]
└─$ echo "Welcome to Linux" | sudo tee /home/studentuser/projectX/welcome.txt
Welcome to Linux
```

```
┌──(llamafart㉿jaivanti)-[~]
└─$ sudo chmod 600 /home/studentuser/projectX/welcome.txt
```

4. Initial Permission Check & Correction

```
┌──(llamafart㉿jaivanti)-[~]
└─$ sudo -u studentuser ls -l /home/studentuser/projectX/welcome.txt
-rw------- 1 root root 17 Jul 28 11:17 /home/studentuser/projectX/welcome.txt

┌──(llamafart㉿jaivanti)-[~]
└─$ sudo chown studentuser:studentuser /home/studentuser/projectX/welcome.txt

┌──(llamafart㉿jaivanti)-[~]
└─$ sudo -u studentuser ls -l /home/studentuser/projectX/welcome.txt
-rw------- 1 studentuser studentuser 17 Jul 28 11:17 /home/studentuser/projectX/welcome.txt
```

5. Script Creation

```
┌──(llamafart㉿jaivanti)-[~]
└─$ sudo tee /home/studentuser/projectX/scripts/backup.sh << 'EOF'
#!/bin/bash
timestamp=$(date +"%Y%m%d_%H%M%S")
cp /home/studentuser/projectX/welcome.txt /home/studentuser/projectX/logs/welcome_$timestamp.txt
EOF
```

6. Make Script Executable

```
┌──(llamafart㉿jaivanti)-[~]
└─$ sudo chmod +x /home/studentuser/projectX/scripts/backup.sh

┌──(llamafart㉿jaivanti)-[~]
└─$ sudo -u studentuser /home/studentuser/projectX/scripts/backup.sh
```

7. Final Verification

4.Conclusion

This PoC validated Linux file permission management by creating a restricted user environment, configuring secure file access, and troubleshooting script execution. The process revealed the importance of proper ownership (`chown`) and permissions (`chmod`) when working with mixed sudo/user contexts. The task successfully demonstrated real-world permission debugging while highlighting common pitfalls in automated file operations.