Assignment - 1

General Instructions

- Create a New Virtual Machine.
- Use **Ubuntu 22.04 LTS (Virtual Machine)**
- Login using a **normal user (not root)**
- Use `sudo` where required
- Execute all commands in **terminal**
- Take **clear screenshots of commands and outputs** and upload them to GitHub.
- also, Write the answers to the questions in a Notepad text file and upload it to GitHub.

Q1: File Server Architecture

Objective

To understand Linux directory structure and file server layout.

Tasks

1. List all directories present in the root (`/`) directory.
2. Identify and write the purpose of the following directories:
   - `/etc`
   - `/home`
   - `/var`
   - `/usr`
   - `/bin`
   - `/sbin`
   - `/tmp`
3. Create the following directory structure:

```
/srv/files/public
/srv/files/private
/srv/files/backup
```

4. Create one file inside each directory.
5. Display the complete directory structure using a single command.

Q2: SSH Installation and Configuration

Objective

To configure SSH and test remote login.

Tasks

1. Install the OpenSSH server package.
2. Verify whether SSH is running.
3. Find the IP address of your Ubuntu VM.
4. Connect to the Ubuntu VM using SSH from Putty or CMD.

Questions

- Why should root SSH login be disabled?

Q3: Linux Services Management

Objective

To understand Linux services and service management.

Tasks

1. Check the status of the SSH service.
2. Stop the SSH service.
3. Start the SSH service again.
4. Restart the SSH service.
5. Enable the SSH service so that it starts automatically on boot.
6. List all active services running on the system.
    - Hint: `systemctl list-units --type=service`

Questions

- What is a service in Linux?
- Difference between **start** and **enable**

Q4: Linux Users and Permissions

Objective

To understand Linux permission model and user access control.

Tasks

1. Create two users:
    - user1
    - user2
2. Set passwords for both users.
3. Create a directory named `/shared`.
4. Assign ownership of `/shared` to `user1`.
5. Set permissions so that:
    - Owner has full access
    - Group has read & execute
    - Others have no access
6. Login as `user2` and try to access `/shared`.
7. Capture the access result.

Questions

- Explain `r`, `w`, and `x`
- What happens if permissions are set to `777`?
- How does permission help in securing data?

Q5: `/etc/passwd` File Analysis

Objective

To understand Linux user account information.

Tasks

1. Open and view the `/etc/passwd` file.
2. Select any one normal user entry and note its fields.
3. Identify the following from `/etc/passwd`:
    - Username
    - UID
    - GID
    - Home directory
    - Login shell
4. Find system users (UID less than 1000).
5. Locate your own user entry.

Questions

- What does the `x` field indicate?
- Why are passwords not stored in `/etc/passwd`?