Linux for Cloud and DevOps

## Project

**Problem Statement:** Create scripts to automate the installation, update, and removal of software packages, as well as managing user accounts and permissions. Ensure that the scripts are robust, secure, and easy to use.

**Description:** This project focuses on the essential skills of package management and user administration in Linux.

Learners will learn how to use package managers to install, update, and remove software packages efficiently. They will also develop scripts to automate these processes, making system maintenance easier. Additionally, learners will work on user administration tasks such as creating, modifying, and deleting user accounts, as well as managing user and group permissions. The scripts will be designed to ensure security and ease of use, with thorough documentation provided to facilitate their deployment in real-world scenarios.

**Steps to Complete the Linux for Cloud and DevOps Project**

**Step 1: Understanding the Requirements**

Two main tasks: package management and user administration (need to create scripts for both)

**Step 2: Set Up Your Environment**

1. Launch a Linux virtual machine (Ubuntu)
2. Create a project directory: **mkdir linux\_project**
3. Navigate to it: **cd linux\_project**

**Step 3: Package Management Scripts**

**A. Installation Script**

1. Create file: **touch install\_packages.sh**
2. Make it executable: **chmod +x install\_packages.sh**
3. Add this basic structure:

#!/bin/bash

*# Update package lists*

sudo apt update

*# Install packages (modify as needed)*

sudo apt install -y $1

*# Verify installation*

dpkg -l | grep $1

**B. Update Script**

1. Create file: **touch update\_system.sh**
2. Make executable: **chmod +x update\_system.sh**
3. Add this content:

#!/bin/bash

*# Update package lists*

sudo apt update

*# Upgrade installed packages*

sudo apt upgrade -y

*# Clean up*

sudo apt autoremove -y

**C. Removal Script**

1. Create file: **touch remove\_package.sh**
2. Make executable: **chmod +x remove\_package.sh**
3. Add this:

#!/bin/bash

*# Remove package*

sudo apt remove -y $1

*# Purge configuration files*

sudo apt purge -y $1

*# Clean up*

sudo apt autoremove -y

**Step 4: User Administration Scripts**

**A. Create User Account**

1. Create file: **touch create\_user.sh**
2. Make executable: **chmod +x create\_user.sh**
3. Add this:

#!/bin/bash

*# Create user with home directory*

sudo useradd -m $1

*# Set password (will prompt for input)*

sudo passwd $1

*# Display created user info*

id $1

**B. Modify User (Add to Group)**

1. Create file: **touch modify\_user.sh**
2. Make executable: **chmod +x modify\_user.sh**
3. Add this:

#!/bin/bash

*# Add user to group*

sudo usermod -aG $2 $1

*# Verify*

groups $1

**C. Delete User**

1. Create file: **touch delete\_user.sh**
2. Make executable: **chmod +x delete\_user.sh**
3. Add this:

#!/bin/bash

*# Delete user and home directory*

sudo userdel -r $1

*# Verify*

getent passwd | grep $1 || echo "User $1 deleted"

**Step 5: Test Your Scripts**

1. **Test installation: ./install\_packages.sh nano**
2. **Test update: ./update\_system.sh**
3. **Test removal: ./remove\_package.sh nano**
4. **Test user creation: ./create\_user.sh testuser**
5. **Test modification: ./modify\_user.sh testuser sudo**
6. **Test deletion: ./delete\_user.sh testuser**

**Step 6: Add Documentation**

1. **Create a README.md file:**

# Linux Automation Scripts

## Package Management

- `install\_packages.sh`: Installs specified packages

- `update\_system.sh`: Updates all system packages

- `remove\_package.sh`: Removes specified packages

## User Administration

- `create\_user.sh`: Creates new user accounts

- `modify\_user.sh`: Modifies user group membership

- `delete\_user.sh`: Deletes user accounts

Usage: ./script\_name [arguments]

**Step 7: Final Checks**

1. **Verify all scripts work as expected**
2. **Check for proper permissions**
3. **Ensure error handling is adequate**
4. **Package your project: zip -r linux\_project.zip \***