

DevOps: Lab Activities

Hardware and Software Requirements

- A laptop with Windows or Ubuntu installed.
- Network connectivity
- Python program development environment (VSCode, PyCharm, Idle, Colab)
- PyLint, Git
- Hypervisor: VMware/VirtualBox

Lab Activity-1

Programming Task: Write a Python program to send a one-time password to a given email address. The one-time password should be a number with at least four digits and, at the most, eight digits. The email ID should be valid.

Subtask: Create a Python application development environment, including VSCode., IDLE, PyCharm or Colab.

Objectives:

1. To refresh steps in Python application development
2. To use ChatGpt for program development.

Lab Activity-2 (Testing)

Programming Task 1:

Write a simple calculator program and write Python tests to check the correctness of different functions.

Subtask: Install pyTest framework

Objectives: To acquire the skill of writing test cases using PyTest framework

Programming Task 2:

Write a simple class in Python capturing students' grades and write different test cases to test the working of different methods

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Objectives: To implement the test data set-up method

Programming Task 3:

Write test cases for OTP functions.

Lab Activity-3 (Code Review)

Development Task: Analyze the Python programs (OTP, calculator and test students grade) using PyLint

Subtask: To install PyLint and improve code quality.

Objective: To develop the industry-standard coding.

Lab Activity-4 (Version Control System)

Objectives: To acquire the skill of local and remote repository management using Git and GitHub

1. Tasks:

- a. Create a local repository
- b. Track changes in a single file.
- c. Create multiple features using Git branching.
- d. Manage and synchronise remote repository and local repository.

Command to be used: init, branch, add, commit, config, checkout, push, pull, remote, log

Lab Activity-5 (Continuous Integration)

Objectives: To set up a build-test-review pipeline for Python application development using GitHub Actions

Standard Workflow to be used: Configure and use Python application development workflow available under GitHub actions.

Lab Activity-6 (Virtual Machines)

Objectives: To create and set up a virtual machine on a desktop.