**Lab Exercise 3 – Unit Testing in Python**

Unit testing is a software testing technique used to verify that individual units or components of a software application work as expected. In Python, you can perform unit testing using the built-in unittest framework or other third-party testing libraries like pytest. Here's a basic overview of how to perform unit testing in Python using unittest:

* Import the necessary modules:
* You need to import the unittest module to create and run tests.

import unittest

**Write test cases:**

* A test case is a class that inherits from unittest.TestCase. You define methods within this class to test specific aspects of your code.
* Define two test methods : test\_addition and test\_subtraction. Each method performs a specific test and uses assertion methods provided by unittest like assertEqual to verify if the expected and actual results match.

**Running the tests:**

You can run your tests in several ways. Here are two common methods:

**a. Using the command line:**

Create a test runner script, for example, test\_my\_module.py, that imports your test cases and runs them. You can use the unittest.TextTestRunner to execute the tests and provide a test discovery mechanism using the -m switch.

Then, you can run the tests using the following command:

**b. Running tests within an IDE or code editor:**

Most IDEs and code editors offer integration with unit testing frameworks. You can simply right-click on your test script or test class and run the tests directly from the IDE.

**Reviewing test results:**

After running the tests, you will see the results in the console. If all tests pass, you'll get an output indicating that all tests were successful. If a test fails, you'll get details about which test failed and why.

Remember to write comprehensive test cases that cover various scenarios and edge cases. Unit testing is an essential practice for maintaining the reliability and quality of your code as it helps you catch and fix bugs early in the development process.