**Lab Exercise 1- Test-Driven Development (TDD) Using GitHub Copilot in VS Code**

**Objective**

* Learn how to use **Test-Driven Development (TDD)** with GitHub Copilot.
* Write tests **before** implementing a feature.
* Use **Copilot to generate test cases** and function implementations.

**Prerequisites**

* **VS Code** installed.
* **GitHub Copilot extension** enabled.
* **Python** installed with pytest. Install using:

pip install pytest

**Step 1: Create a New Project**

1. Open **VS Code** and create a new folder: TDD\_Project.
2. Inside the folder, create two files:

calculator.py

test\_calculator.py

**Step 2: Write a Test First (TDD Approach)**

1. Open test\_calculator.py.
2. Type the following comment and let Copilot generate the test function:

#Write a test for an add function

import pytest

from calculator import add

def test\_add():

assert add(2, 3) == 5

assert add(-1, 1) == 0

assert add(0, 0) == 0

1. Save the file.

**Step 3: Run the Test Before Implementing the Function**

1. Run the test using:

pytest test\_calculator.py

1. It will **fail** because add() is not implemented yet.

**Step 4: Use Copilot to Implement the Function**

1. Open calculator.py.
2. Type the following comment and press Tab:

# Implement an add function

def add(a, b):

return a + b

1. Save the file.

**Step 5: Run the Test Again**

1. Run the test again using:

pytest test\_calculator.py

1. The test should **pass** now.

**Step 6: Extend with More TDD Cases**

1. Modify test\_calculator.py to add tests for a **subtract function**:

from calculator import subtract

def test\_subtract():

assert subtract(5, 3) == 2

assert subtract(0, 1) == -1

assert subtract(10, 10) == 0

1. Run the test:

pytest test\_calculator.py

1. It will fail since subtract() is missing.

**Step 7: Use Copilot to Implement subtract()**

1. Open calculator.py.
2. Type:

# Implement a subtract function

def subtract(a, b):

return a - b

1. Save the file and run the test again:

pytest test\_calculator.py

1. All tests should pass.

**Lab Summary**

1. Used **TDD** to write tests before implementation.
2. Used **GitHub Copilot** to assist with function creation.
3. Successfully tested and implemented **add() and subtract()** functions.