Lab 2: Test Driven Development and Behavior Driven Development

Objective

To understand and implement the principles of **Test-Driven Development (TDD)** and **Behavior Driven Development (BDD)** by writing tests before writing functional code and ensuring behavior-focused development through examples and scenarios.

Tools & Technologies Used

- Programming Language: e.g., Python
- TDD Framework: e.g., PyTest, JUnit
- BDD Framework: e.g., behave (Python), Cucumber
- IDE: e.g., VS Code, IntelliJ
- Version Control: Git

Introduction

Test Driven Development (TDD) is an Agile software development practice where test cases are written **before** the actual code. The TDD cycle typically follows:

1. **Red** – Write a failing test.
2. **Green** – Write the minimum code to pass the test.
3. **Refactor** – Improve the code while keeping tests green.

Behavior Driven Development (BDD) builds on TDD by focusing on the **behavior of the application from the end-user's perspective**, using **plain language scenarios** (e.g., Given-When-Then).

Implementation

- **Test case 1: Addition**

```
test('Add two numbers', () {
    expect(add(2, 3), equals(5));
});
```

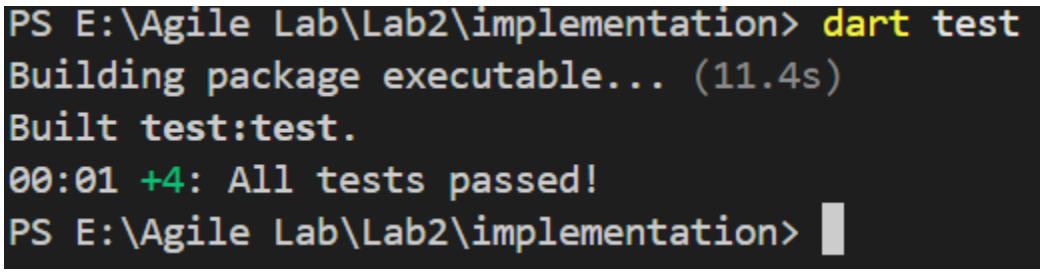
- **Code to pass the test**

```
int add(int a, int b) => a + b;
```

Note: The full implementation and test cases are provided under the **Lab2/implementation** folder of this repository.

Observations

- Writing tests before code helps define clear objectives.
- BDD makes communication easier between developers, testers, and stakeholders.
- Both methods promote clean, reliable, and testable code.



Conclusion

In this lab, we developed a basic calculator program and learned Agile testing practices like TDD and BDD.