**Day 3 - Assignment 1:**

**------------------------------------------------------------------------------------------------------------------------------------------**

**Problem:** Create an infographic illustrating the Test-Driven Development (TDD) process. Highlight steps like writing tests before code, benefits such as bug reduction, and how it fosters software reliability**.**

**Solution:**

**1. Introduction to TDD**

Definition: Test-Driven Development (TDD) is a software development approach in which tests are written before the actual code.

**2. TDD Process Steps**

**Step 1: Write a Test**

**Description**: Write a test for the next bit of functionality you want to add.

**Example**: Create a unit test that specifies and validates what the code will do.

**Step 2: Run the Test**

**Description**: Run the test and see it fail, since the code is not yet implemented.

**Purpose**: Ensure that the test is working correctly and that there are no false positives.

**Step 3: Write the Code**

**Description**: Write the minimal amount of code needed to make the test pass.

**Focus:** Implement just enough functionality to pass the test, avoiding any superfluous coding.

**Step 4: Run All Tests**

**Description**: Run all tests to ensure that the new code doesn’t break any existing functionality.

**Goal**: Verify that all tests pass including the new one.

**Step 5: Refactor the Code**

**Description**: Refactor the code to improve its structure without changing its behavior.

**Objective**: Enhance code quality while ensuring that all tests still pass.

**Step 6: Repeat**

**Description**: Repeat the cycle for each new functionality.

**Cycle**: Write a new test, run the test, write code, run all tests, and refactor.

**3. Benefits of TDD**

**Benefit 1: Reduces Bugs**

Explanation: Writing tests first helps identify potential issues early in the development process.

**Benefit 2: Enhances Code Quality**

Explanation: Refactoring ensures that code is clean, efficient, and easy to maintain.

**Benefit 3: Ensures Reliability**

Explanation: Continuous testing guarantees that the software behaves as expected.

**Benefit 4: Facilitates Changes**

Explanation: Well-tested code can be refactored and extended more easily and with confidence.