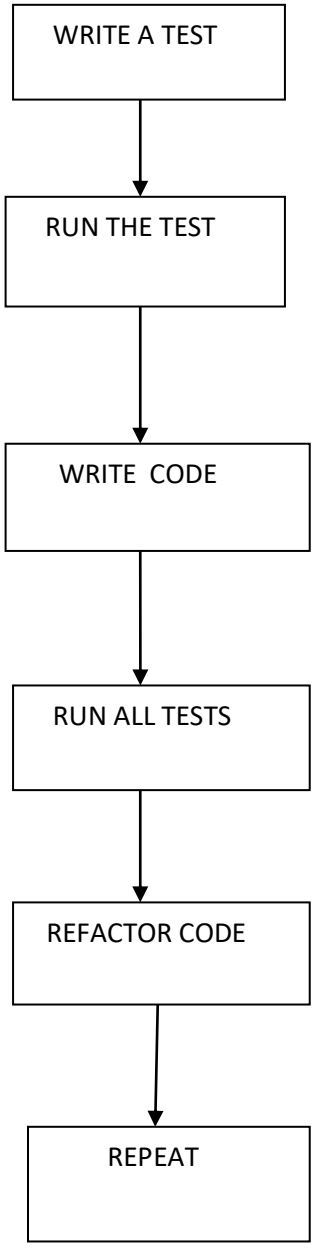
Assignment 1: Create an infographic illustrating the Test-Driven Development (TDD) process. Highlight steps like writing tests before code, benefits such as bug reduction, and how it fosters software reliability.

TDD FLOW CHART



Infographic Title: Test-Driven Development (TDD) Process

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1. Introduction to TDD

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

Goal: Ensure code quality and reliability by validating functionality through automated tests.

2. TDD Cycle

Write a Test

Description: Write a test for the new functionality. The test should fail initially because the functionality isn't implemented yet.

Icon: Pen writing on a document with a red cross symbol.

Run the Test

Description: Run the test to ensure it fails. This step verifies that the test is detecting the absence of the feature.

Icon: Computer screen showing a failing test (red cross).

Write Code

Description: Write the minimal amount of code necessary to pass the test.

Icon: Code editor with some lines of code.

Run All Tests

Description: Run all tests to ensure the new code passes the test and doesn't break existing functionality.

Icon: Computer screen showing passing tests (green checkmarks).

Refactor Code

Description: Clean up the code while ensuring all tests still pass. Improve code structure and remove any duplication.

Icon: Code editor with cleaner, more organized code.

Repeat

Description: Repeat the cycle for new functionality.

Icon: Circular arrow indicating iteration.

3. Benefits of TDD

Bug Reduction

Description: Catch bugs early by writing tests first. This leads to fewer bugs in production.

Icon: Bug with a prohibition sign over it.

Improved Code Quality

Description: Encourages clean, maintainable code through refactoring.

Icon: Sparkling clean code document.

Reliable Software

Description: Automated tests ensure continuous verification of code functionality.

Icon: Shield symbolizing reliability.

Faster Development

Description: Less time spent debugging and fixing issues, leading to quicker development cycles.

Icon: Stopwatch with a forward arrow.

4. TDD Best Practices

Start Small: Begin with simple tests and gradually add complexity.

Stay Consistent: Maintain the TDD cycle consistently throughout development.

Write Meaningful Tests: Ensure tests cover various edge cases and scenarios.

Refactor Regularly: Keep the codebase clean and efficient by regularly refactoring.

5. TDD Advantages

- **Improved code quality:** TDD ensures that code is clean and optimized, and that each stage of the code works as it progresses.

- **Fewer bugs:** TDD helps prevent bugs and errors, which means developers spend less time fixing them.

- **Faster development:** TDD allows developers to make changes quickly without worrying about breaking existing function, cause test can be return after each code change.

- **Easier debugging**: TDD allows for faster debugging and minor debugging.