Lesson 5 Assignment: Testing Software

Multiple Choice Questions

What is the primary purpose of using assertions in programming?

- A. To improve the performance of the code.
- B. To document the code.
- C. To automatically correct errors.
- D. To check for conditions that should always be true.

Which type of test checks the correctness of a single unit of software, like a function?

- A. Integration test.
- B. Unit test.
- C. Regression test.
- D. System test.

What is the main goal of integration testing?

- A. To test individual units or components.
- B. To test the entire system as a whole.
- C. To test the interaction between integrated units/components.
- D. To test the software's user interface.

What is a key characteristic of regression testing?

- A. It is used to test new features.
- B. It compares current results with historical data to check for regressions.
- C. It focuses on performance testing.
- D. It is performed only once at the end of the development cycle.

Continuous Integration (CI) is a practice that involves:

- A. Running tests manually after every change.
- B. Automatically running tests whenever changes are made.
- C. Running tests on a monthly basis.
- D. Testing software only before major releases.

Short Answer Questions

- Explain the role of assertions in defensive programming. How do they contribute to more robust software?
- What is test coverage and why does 100% test coverage not guarantee software is completely correct? Explain whether you think 100% coverage should be aimed for in scientific software.
- What are some of the main benefits of continuous integration? Why does setting it up require being explicit about dependencies and installation steps?

- Do you think test-driven development is an effective approach for scientific software? Why or why not?
- You've written a function that sorts a list of names. However, you've noticed that it fails to sort names correctly when they contain accented characters (e.g., "Émilie"). Propose a test case to verify this issue and suggest a way to modify the function or its tests to handle such cases.