Informatics 115 – Fall 2022
Professor Iftekhar Ahmed
Homework 3
Assigned: Tuesday, October 25th, 2022
Due: Thursday, November 3rd, 2022 at 11:59PM

Structural Testing, Code Coverage, and Instrumentation

Download the file TriangleType.zip from Canvas to your computer. This unzipped file contains a class called TriangleType and two mostly empty test files.

This homework builds upon your code from Homework 2. The same TriangleType program and specifications from Homework 2 (Problem 4) apply. In this homework, you will get the source code for the TriangleType program rather than just the black-box JAR file from the last homework.

1. Create a new Eclipse project and then import the source files from the zip file.
2. In the unzipped directory is a Java file called TriangleTypeFunctionalTest.java that only contains a dummy test case. You will edit this file to include the functional test cases that you wrote for homework 2. Please simply copy in your old test cases and do not add test cases to this file. In other words, do not try yet to do structural testing by looking at the source code of the TriangleType class (except maybe to understand its interface).
3. Install the EclEmma plugin in Eclipse or any plain that provides coverage information. Run your functional tests while assessing its coverage. I would expect that not all of the program would have 100% full structural coverage, even with an elaborate functional test suite.
4. Take a screenshot of the coverage report, while showing the TriangleType class's source code colored according to its coverage (with red, yellow, and green coloring) with the functional tests. Name the screenshot file "functional.jpg" or "functional.png".
5. For any of the statements, branches, and conditions that are not fully covered in the TriangleType.java file, complete the coverage with test cases placed into the TriangleTypeStructuralTest class. You can run all test cases (from both the functional test suite and the extra test cases in the structural test suite) by right-clicking on the top-level project entry in the Package Explorer (instead of the low-level individual test files) and choosing "Coverage As... -> JUnit Test".
6. Take a screenshot of the coverage report, while showing the TriangleType class's source code colored according to its coverage (with red, yellow, and green coloring) with the functional ***and*** structural tests. Name the screenshot file "structural.jpg" or "structural.png".
7. Complete the studentInfo.txt file. Fill in your last name, first name, UCInetID, and student number.

Note: We will be grading based on the percent coverage for the ***combination*** of the structural and functional test cases on the TriangleType class. In other words, ***do not*** worry about the white-box coverage for the functional test file. However ***do*** attempt to get 100% coverage (or as near as possible) when adding in the structural test cases. Also, do not be concerned with the coverage reports for the JUnit test files — only be concerned with the coverage of the actual TriangleType.java file. We will be checking the "instruction counters" and "branch counters" coverage percentages. Finally, please double check to make sure that the files that you turn in (in the .zip file) contain your test cases — it is easy to make the mistake to assume that Eclipse is editing the original files, and turn in the originals without your test cases that are in your workspace.

Upload Instructions

Turn in one zip file that contains the following files:

TriangleType.java
TriangleTypeFunctionalTest.java
TriangleTypeStructuralTest.java
functional.jpg
structural.jpg
studentInfo.txt (filled out with your information)