

# Software Quality & Testing – Homework 10

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**Considering that all tests pass, is this enough to guarantee that the TriangleClassifier program is bug-free? If there was a bug in the program, would it be possible to uncover it by adding more assertions to the existing test cases? Or would we need to create more test cases? Motivate your answers.**

Considering the famous quote in USI:

Tests cannot prove correctness

by Antonio Carzaniga, any test suite cannot prove the program is correct as test suites cannot exhaustively express program behaviour.

There is indeed a bug in the program: the value of `c` should be checked to be `<= 0` instead of `< 0`, as all sides of a triangle should have positive length.

This bug cannot be uncovered by adding more assertions to the existing test cases, but it needs to be uncovered with an additional test case where `side3 = 0` since none of the tests covers this value of `c`. An example test case could be:

```
@Test
public void test7() {
    int side1 = 2;
    int side2 = 2;
    int side3 = 0;

    Assertions.assertThrows(IllegalArgumentException.class, () -> {
        result = TriangleClassifier.classify(side1, side2, side3);
    });
}
```