COMP-4100 Software Verification and Testing

Assignment One

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Purpose

Write a function in a programming language like Python, Java, C++ that solves the problem of triangle type. Your function should successfully pass at least 10 test cases and should fail on 2 test cases.

Program Details

Run Command: python "triangle-test.py"

This program fulfills all requirements. When creating this program, the idea of passing specific test cases was kept in mind. The Python programming language was chosen due to the developer being familiar with this technology and because this language is easy to use and fast to develop programs. The method for passing 13/15 test cases is an if statement that uses the triangle inequality test as its condition.

Run Command: python "triangle-test-upgrade.py"

Another version of this program was created to show that the failed test cases in the first version can be fixed with an upgraded version of the previously shown program. This upgraded version has a try and catch statement to handle a non-integer value and default values if the function is called with less than three input values. This program will pass all test cases.

Test Cases and Findings

Test Conducted	Input Used	Final Output	Reason For Output
Valid Equilateral Triangle	triangle-test(1,1,1)	Pass	Passed the triangle inequality test and was valid integer input
Valid Isosceles Triangle	triangle-test(3,3,2)	Pass	Passed the triangle inequality test and was valid integer input
Valid Scalene Triangle	triangle-test(4,2,3)	Pass	Passed the triangle inequality test and was valid integer input
Invalid Isosceles Triangle	triangle-test(2,2,4)	Pass	Failed the triangle inequality test
Invalid Scalene Triangle	triangle-test(1,2,3)	Pass	Failed the triangle inequality test

Permutations for Isosceles Triangle Sides	triangle-test(3,3,4) triangle-test(3,4,3) triangle-test(4,3,3)	Pass	Passed the triangle inequality test and valid integer input
Input With One Side Being Zero	triangle-test(3,4,0)	Pass	Failed the triangle inequality test
Input With One Side Being Negative	triangle-test(1,1,-1)	Pass	Failed the triangle inequality test
Input With the Sum of Two Sides Being Equal to The Third Side	triangle-test(1,1,2)	Pass	Failed the triangle inequality test
Permutations of previous case, Sum of Two Sides Being Equal to The Third Side	triangle-test(1,2,1) triangle-test(2,1,1)	Pass	Failed the triangle inequality test
Three integers >0 such that the sum of two of the numbers is less than the third	triangle-test(1,1,3)	Pass	Failed the triangle inequality test
Permutations of previous case, three integers >0 such that the sum of two of the numbers is less than the third	triangle-test(1,3,1) triangle-test(3,1,1)	Pass	Failed the triangle inequality test
Input All Sides Equal to Zero	triangle-test(0,0,0)	Pass	Failed the triangle inequality test
Input Non-Integer Value	triangle-test(0,0,'a')	Fail	Throws a ValueError exception, program crashes
Input Wrong Number of Arguments	triangle-test(1,1)	Fail	Throws a TypeError exception, program crashes