**Programming 2 – Homework 1: Whitebox testing**

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**Code analysis:**

This code is being used to identify which type of triangle we have before us and now I will be conducting this test in order to verify the different outputs of said using every possible input and combination to check this codes validity and its possible flaws.

As the code contains many conditions, I will firstly test the initial conditions and carry on to testing those further down in the code’s branches.

**Test Plan:**

Firstly, I will begin to input the in order to test the very first conditions of the first branch of the code and its multiple variations and outputs, I will check and record its results, using a test case table listing all inputs used and a matching truth table to compare conditions met or unmet conditions.

As some inputs may be false in the first condition they may carry over to next branch of the code and hence I will be following and reusing the inputs.

If an input that gives a certain result is tested, I will not test another variation of that input as it will likely give the same result and it seems unnecessary.

**2 1 2 – isosceles**

**1 1 1 – equilateral**

**Anything with 0 – invalid**

**2 1 1 – not a triangle**

**5 6 3 – scalene triangle**

**Test cases:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| I | | j | | | k |
| **2** | | **1** | | | **2** |
| **1** | | **1** | | | **1** |
| **1** | | **1** | | | **0** |
| **2** | | **1** | | | **1** |
| **5** | | **6** | | | **3** |
| (i>0) | (j>0) | | (k>0) | !((i>0) && (j>0) && (k>0)) | |
| **True** | **True** | | **True** | **False** | |
| **True** | **True** | | **True** | **False** | |
| **True** | **True** | | **False** | **True** | |
| **True** | **True** | | **True** | **False** | |
| **True** | **True** | | **True** | **False** | |

**1 1 0 = invalid**

**2 1 1 = not a triangle**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| I | | j | | | k |
| **2** | | **1** | | | **2** |
| **1** | | **1** | | | **1** |
| **2** | | **1** | | | **1** |
| **5** | | **6** | | | **3** |
| (i>=j+k) | (j>=k+i) | | (k>=i+j) | (i>=j+k) || (j>=k+i) || (k>=i+j) | |
| **False** | **False** | | **False** | **False** | |
| **False** | **False** | | **False** | **False** | |
| **True** | **False** | | **False** | **True** | |
| **False** | **False** | | **False** | **False** | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| I | | j | | | k | Match |  |
| **2** | | **1** | | | **2** | **1** |  |
| **1** | | **1** | | | **1** | **3** |  |
| **5** | | **6** | | | **3** | **0** |  |
| (i==j) | (j==k) | | (k==i) | (i==j) || (j==k) || (k==i) | | (match == 0) | (match ==1) |
| **False** | **False** | | **True** | **True** | | **False** | **True** |
| **True** | **True** | | **True** | **True** | | **False** | **False** |
| **False** | **False** | | **False** | **False** | | **True** | **False** |

**5 6 3 = scalene triangle**

**2 1 2 = isosceles triangle**

**1 1 1 = equilateral triangle**

**Completed test:**

