**Triangle Type Verification Application**

**Author**: John Eric Simmons

**Date Written**: 12/16/2017

**Application stored in my personal GitHub repository at**: <https://github.com/billionayer/CardlyticsEvalCode/tree/master/TriangleTypeChecker>

**Development Environment**: Visual Studio 2015 (Community Edition)

Development Language: C#

Application Structure:

3 Projects

* **DataObjects** – This project houses the objects used to represent both a Triangle and a Triangle Test
  + **Triangle Class** - encapsulates the necessary logic to evaluate if the set of values provided in the file are a valid triangle, and determines the type of triangle (SCALENE, ISOSCELES, or EQUILATERAL)
    - The triangle class verify the following scenarios:
      1. If the set of numbers provided contains exactly three numbers.
      2. If the sum of two sides is greater than the third
      3. If all numbers provided are greater than zero. (This is further enforce by the use of usigned integers in the code.
      4. The code also uses a ulong for the numbers so that we can will not get any data truncation issues if a user attempts to put in a number that exceeds the limits for a specific integer type.
  + **TriangleTest Class –** encapsulte the necessary logic to store the results of the test data against the generated results. In essence the triangle data is loaded into Triangle Classes, and the expected result is also stored into memory. Then the application compares the expected triangle type loaded from the file to the triangle type generated by the Triangle Class. If the two types do not match the TriangleTest class will house the results and the reason for the mismatch.
* **BusinessServices** – This proejct houses the objects used to perform business logic and collections of Data objects.
  + **Triangles Class** – Serves as a collection of triangle objects
  + **TriangleTests Class** – Serves as a collection of triangle test objects and performs some basic funtions such as loading of the data file and verifying inputs from each line in the file.
* **TriangleTypeTestingApp** – This project houses the testing application to verify and display the results
  + The application is a standard Windows Forms Application that uses the following:
    - OpenFileDialog (used to navigate the file system to find a triangle file data file
    - Buttons to invoke actions
    - DataGridView to display the results of the file and the test run.
  + In the grid here is what all the colors mean.
    - If the text of the grid item is red, then it means that the expected triangle type in the the file does not match the type evaluated from the three numbers given.
    - If the background color of a data grid row is yellow, then based on the numbers provided, they do not represet a valid triangle.
    - If the background color is yellow and the text is red, it means that not only do the number represent an invalid triangle but also the result does not match the expected result in the file.
    - The grid also displays result notes as to why the validation failed. If there no notes, then all is well.

Care was taken to consider situations such as invalid data in the file, passing of null reference objects, and file handling expections should an I/O exception occurred. The application also attempt to handle situations where the files does not exists.

