

# ENG TECH 1PR3 Programming Principles

## *Sub and function procedures*

### **Lab 04**

Be sure to assign all input to appropriate variables. Do NOT use the control name directly in the calculations. Instead, assign the value of a control to a variable and use the variable in the calculations. Assign the result of the calculations to an appropriate form control. Ensure the forms are well-behaved. A form must contain an Exit button, sensible tabbing and alt-shortcuts where appropriate. **DO NOT USE FORM/CLASS LEVEL VARIABLES.**

1. Triangle inequality theorem states that the sum of two sides of a triangle must be greater than the third side. If this is true for all three combinations, then you will have a valid triangle. For example, if a, b and c are three sides of a triangle then

$$a + b > c, \quad a + c > b, \quad b + c > a$$

We define perimeter and area of a triangle as

Perimeter:  $P = a + b + c$

Area:  $A = \sqrt{p(p-a)(p-b)(p-c)}$ , where  $p = P/2$

Write a VB application that will randomly generate the sides of 5 triangles and calculate the perimeter and area of each triangle. When the user clicks **btnTriangles** button, it should complete the following tasks:

- (a) Call **getTriangleSides(...)** sub-procedure within click event procedure of **btnTriangles**. This procedure will randomly generate three sides of a triangle. Each side of a triangle must be greater than zero and less than 10.
- (b) Call **getProperties(...)** sub-procedure within click event procedure of **btnTriangles**. This procedure will calculate the perimeter and area of the triangle.
- (c) Display sides of 5 triangles with perimeter and area in tabular format within click event procedure of **btnTriangles**. Format numbers to one decimal place.

Add clear button in your application.

### **Submitting the Lab**

In order for your Lab/Assignment to be eligible for grading you must submit the following:

- The code must contain your Full Name and Student ID in a comment block at the top of each form module.
- A .zip compressed file containing the entire VB.NET project to AVENUE. Use .zip compression only (no RAR, TAR etc). If there is more than one project, create a separate .zip file for each individual project. Be sure to add all project files and folders to the .zip file. If the compressed file is missing files/folders such that the project will not open or run, the lab/assignment will receive a grade of 0.
- A Word .doc (or .docx) file containing:

- A cover page that includes your name, Student ID, and MAC ID
- The form code (event and other subprocedures and functions) including programmer's block
- Screen captures of the form showing sample input and output.

Upload the Word file and .zip file(s) **separately** to the appropriate assignment drop-box on AVENUE.

Labs and assignments will not be accepted for evaluation if any of the above items are omitted and will result in a grade of 0.