

## ECE 71/191T – Data Structures and Algorithms

Dr. Gregory R. Kriehn, Fresno State  
C++ Homework Assignment: Chapter 7

**Code Due By:** Midnight on Mon, Jan 30

**Write-up Due By:** Class on Tue, Jan 31

### HOMEWORK #13 – Triangle Classification

Based upon the lengths of the 3 sides, determine if a triangle is scalene, isosceles, or equilateral, or if the sides do not form a triangle.

For a triangle to exist, the sum of the lengths of any two sides is greater than the length of the third side.

#### Specifications:

Write a program that:

1. Defines an enumeration type, **triangleType** that has the values **scalene**, **isosceles**, **equilateral**, and **noTriangle**.
2. Wraps the enumeration type in a namespace called **Triangle**.
3. Uses a function, **triangleShape**, that takes three numbers as formal parameters, each of which represents the length of a side of the triangle. The function should then return the shape of the triangle.
4. Prompts the user to input the length of the sides of a triangle and outputs the shape of the triangle.

Use the following function prototype for the **triangleShape** function:

```
// Determines if the three sides form a triangle
Triangle::triangleType triangleShape(int a, int b, int c);
```

**Note:** You are **NOT** allowed to any:

```
using namespace namespaceVar;
```

statements for this program.

```
Triangle testing program
```

```
Enter length of side a: 30
```

```
Enter length of side b: 5
```

```
Enter length of side c: 5
```

The triangle type is: Not a Triangle

---

Triangle testing program

Enter length of side a: 10

Enter length of side b: 5

Enter length of side c: 5

The triangle type is: Not a Triangle

---

Triangle testing program

Enter length of side a: 3

Enter length of side b: 4

Enter length of side c: 5

The triangle type is: Scalene

---

Triangle testing program

Enter length of side a: 7

Enter length of side b: 5

Enter length of side c: 7

The triangle type is: Isosceles

---

Triangle testing program

Enter length of side a: 8

Enter length of side b: 8

Enter length of side c: 8

The triangle type is: Equilateral

Once you verify the operation of your program, submit your source code to the Grader Program.

## HOMWORK #14 – Student Names

You are given a file called 'Students.txt' containing names of students with the following format: *lastName, firstName middleName*. (Note that a student may not have a middle name.) Re-arrange the format of the name of each student name to: **firstName middleName lastName**.

### Specifications:

Write a program that reads each students' entire name into a string variable. The string variable should then be passed to a function that converts the name to the proper format and returns the converted name. Use of the **find**, **length**, and **substr** functions from the string library will be helpful. Print the results of each converted name to the screen.

Use the following function prototype for your function:

```
// Converts the string name to the proper formate
String convertName(string name);
```

If the file cannot be found, print:

```
The input file could not be opened.
Program terminating.
```

Assuming the format of the input data file is:

```
Miller, Jason Brian
...
```

the output could be:

```
Jason Brian Miller
Lisa Maria Blair
Anil Kumar Gupta
Bobby Smith
Sumit Sahil Arora
Rhonda Beth Saleh
```

Once you verify the operation of your program, submit your source code to the Grader Program.