Submit Assignment

Homework 4

Due No Due Date **Points** 30 **Submitting** a file upload **Available** Jun 15 at 3pm - Jun 22 at 12:30pm 7 days

To exemplify using arrays as both input and output values of functions, I want you to write a program that deals with triangle transformations. You will ask the user to input 3 sets of x and y pair coordinate points and operate on those original points (remember, a triangle can be represented with 3 points on a plane). You will be storing these points in a multidimensional array with 3 rows and 2 columns ([3][2]). You will ask the user to enter in each point pair one at a time. Refer to the sample input/output for how.

You will be writing 4 functions this time. clockwiseRotateTriangle, reflectTriangle translateTriangle, and printTriangle.

The clockwiseRotateTriangle will rotate the triangle 90 degrees clockwise. You shouldn't need the math library to complete this. The function will return nothing. It will have arguments of an input array that holds the points (the original triangle you had the user input) and an array to place the new rotated triangle in.

The reflectTriangle will reflect the triangle over the x or y axis. You will have the user input a axis via scanf in the form of a character (Do the scanning in main). The function will return an integer, 0 or -1. 0 if the axis was valid (x or y or X or Y) and -1 if it was invalid. It will have arguments of an input array that holds the points (the original triangle you had the user input), an array to place the new reflect triangle in, and a character to denote the axis to reflect over.

The translateTriangle will translate the triangle an x and/or y direction. You will have the user input a two values via scanf in the form of a integers (Do the scanning in main) to pass to the function for the translation. The function will return nothing. It will have arguments of an input array that holds the points (the original triangle you had the user input), an array to place the new translated triangle in,an integer to translate in the x direction, and an integer to translate in y direction.

Finally, you will have a printTriangle function for printing the triangle on the screen. This print triangle function will take in an input array that holds the points of a triangle to print. You will then loop through the array to print the triangle. HOWEVER, I want you to iterate through the triangle using pointer arithmetic (examples in chapter 12).

This program is a good example of using arrays as points and reiterates using arrays as paramaters for functions. Only do your scanning in main. You should be encapsulating functionality in your functions.

```
Enter point #1 as x and y: 2 7
Enter point #2 as x and y: -3 4
Enter point #3 as x and y: -1 0
Starting Triangle: (2, 7)(-3, 4)(-1, 0)
Rotated Triangle: (7, -2)(4, 3)(0, 1)
Enter axis to reflect (x or y): y
Reflected Triangle: (-2, 7)(3, 4)(1, 0)
Enter translation values (x and y): 0 5
Translated Triangle: (2, 12)(-3, 9)(-1, 5)
```

```
Enter point #1 as x and y: 8 5
Enter point #2 as x and y: 3 -2
Enter point #3 as x and y: -6 -7
Starting Triangle: (8, 5)(3, -2)(-6, -7)
Rotated Triangle: (5, -8)(-2, -3)(-7, 6)
```

```
Enter axis to reflect (x or y): x
Reflected Triangle: (8, -5)(3, 2)(-6, 7)
Enter translation values (x and y): -2 4
Translated Triangle: (6, 9)(1, 2)(-8, -3)
```

```
Enter point #1 as x and y: 8 5
Enter point #2 as x and y: 3 -2
Enter point #3 as x and y: -6 -7
Starting Triangle: (8, 5)(3, -2)(-6, -7)
Rotated Triangle: (5, -8)(-2, -3)(-7, 6)
Enter axis to reflect (x or y): k
Reflected Triangle: Invalid Axis. Next time enter x or y.
Enter translation values (x and y): 0 0
Translated Triangle: (8, 5)(3, -2)(-6, -7)
```