CSCE 160 – Prof. Kim

HW #1 – Triangle *You may work in a group of up to **2** students.*

This assignment involves creating a program that determines the type of a triangle based on the input of the length of its three sides, or the three angles (and whether or not it is a triangle at all).
A skeleton code/template is provided for you on the course website.

Based on the lengths of the three sides:
A valid triangle, given the three lengths x, y, z, is where $z > y$ and $z > x$ and $x + y > z$.
Equilateral – All sides have equal lengths
Isosceles – Two of the sides have equal lengths
Scalene – All sides have different lengths

Based on the angles (in degrees):
Valid triangle – Given the three angles a, b, c, all angles are greater than 0 and $a+b+c=180$
Right – One of the angles are 90
Obtuse – One of the angles are greater than 90
Acute – All three angles are less than 90

Your program should follow the structure as described below.
Inside an infinite loop, print to the screen the following menu:

```
---------------------------------------
Program Modes:
   (1)   Side Lengths
   (2)   Angles
   (3)   Quit
Enter mode:
```

Then, read in the user input. Choosing option 1 will result in the program asking the user to enter the lengths of the three sides as follows (user input values are shown in green for illustration purposes.):

```
---------------------------------------
Program Modes:
   (1)   Side Lengths
   (2)   Angles
   (3)   Quit
Enter mode: 1

Enter Side 1: 10
Enter Side 2: 20
Enter Side 3: 45
```

The program will then determine if it is a triangle or not, as well as what type of triangle it is and print a corresponding message to the screen. The program should repeat itself until the user decides to quit. (A sample series of output is provided on the last page.)

Instructions for submitting your program:

1. Create a HW1 folder on the appropriate place on your K drive.
2. Everyone's name should be in the header.
3. Place a copy of the .java file in the HW1 folder.

If your program does not compile/build, you will receive an automatic F for the assignment. There is a 20% penalty for poor documentation & readability. Make sure to place comments so that others can understand what's going on.

Sample Output: *(The orange font is what the user types in. Rest are computer messages)*

```
----------------------------------------
Program Modes:
       (1) Side Lengths
       (2) Angles
       (3) Quit
Enter mode: 1

Enter Side 1: 10
Enter Side 2: 20
Enter Side 3: 45

This is not a valid triangle!
----------------------------------------
Program Modes:
    (1) Side Lengths
    (2) Angles
    (3) Quit
Enter mode: 2

Enter Angle 1: 60
Enter Angle 2: 60
Enter Angle 3: 60

This is a acute triangle.
----------------------------------------
Program Modes:
    (1) Side Lengths
    (2) Angles
    (3) Quit
Enter mode: 1

Enter Side 1: 10
Enter Side 2: 10
Enter Side 3: 15

This is an isosceles triangle.
----------------------------------------
Program Modes:
    (1) Side Lengths
    (2) Angles
    (3) Quit
Enter mode: 3

Good Bye.
```