Sides of a Right Triangle

Due

Monday, September 14 11:59pm EDT

Background

A right triangle is a special geometric figure in mathematics. The length of the sides of a right triangle satisfy Pythagoras' theorem (i.e., the square of the largest side of the triangle is the sum of squares of the two smaller sides).

Task

You are to write a program that reads three integers from standard input (in no specific order) and determine whether they can be the lengths of the sides of some right triangle. Depending on whether or not any valid right triangle exists, your program is to write corresponding text to standard output as shown in the below sample input instances.

You may assume that user input will be valid integers. Note that 0 and negative integers are valid integers. For example, the second sample input instance has a negative integer present in the input.

Objective

- To practice writing a small C++ program, along with compiling and running it.
- To practice basic C++ input/output functionality.
- To practice basic arithmetic operators in C++.

Sample Input Instance 1

```
Input three Integers: 3 4 5
```

Sample Output

```
(5*5) == (3*3) + (4*4)
thus the input integers can be the sides of a right triangle.
```

Sample Input Instance 2

```
Input three integers: 10  8  -6
```

Sample Output

```
The input integers cannot be the sides of a right triangle.
```

Sample Input Instance 3

```
Input three integers: 10  6  8
```

Sample Output

```
(10*10) == (6*6) + (8*8)
thus the input instance can be the sides of a right triangle.
```

General Requirements

- No global variables
- All input and output must be done with streams (e.g., `cout`, `cin`) in `iostream`.
- You may only use `iostream` and `vector` from the C++ standard library (you do not need any others for these tasks). Libraries other than the C++ standard library are not permitted.
- Do not use Windows-specific headers like `stdafx.h` and `conio.h`
- Your source code should be readable and well-documented.
- Only one `.cpp` file is to be submitted.

Submission

Program submissions should be done through the blackboard.

General Advice - always keep an untouched copy of your finished homework files on your computer science account. These files will have a time-stamp which show when they were last modified (a timestamp from the CS servers) and will serve as a backup in case you ever have legitimate problems with submitting files through blackboard. Do this for ALL programs.

Changelog

10Sep15 - Add `vector` to the list of permitted standard library classes that may be used.