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////////////////////////////////////
//                               ECC EDP-121 Spring 2001                               //
//                               //
//   Type of Assignment:      Take Home                                           //
//   Problem Number:         5                                                     //
//   Author:                 Glenn Mayer                                          //
//   Section Number:         99                                                   //
//   Date Assigned:          01/10/01                                             //
//   Program Name:           Triangle Program                                     //
//   Textbook Reference:     Handout #5                                           //
//   File Name:              triangle.cpp                                         //
//                               //
//   Purpose of Program:                                             //
//       This program will read in three floating point numbers and             //
//       will determine if they could form the three sides of a triangle.       //
////////////////////////////////////

// Include Section
#include <iostream.h>

// Main Program
int main( )
{
    // Variable Declations
    double side1;                // the first side entered by the user
    double side2;                // the second side entered by the user
    double side3;                // the third side entered by the user
    int triangle;                // this is the results of the triangle calculation

    const int good = 1;          // this is the value that goes into the variable
                                // triangle if the three sides make a triangle
    const int bad = 2;           // this is the value that goes into the variable
                                // triangle if the three sides do not make a triangle
    char answer;                 // the users answer to the question
                                // "do you want to do it again?"
                                // a 'y' or a 'Y' is YES, anything else is
                                // interpreted as NO

    // Output Identification
    cout << "Take Home #5 by Glenn Mayer - "
         << "Triangle Program\n\n";

    // Main Program
    // describe program's purpose to the user
    cout << "This program will read in three floating point numbers and\n";
    cout << "will determine if they could form the three sides of a triangle.\n\n";

    do        // keep repeating the code as long as the user wants
    {
        // get the three sides from the user
        cout << "\nEnter side 1: ";
        cin >> side1;                // get side 1
        cout << "Enter side 2: ";
        cin >> side2;                // get side 2
        cout << "Enter side 3: ";
        cin >> side3;                // get side 3
    }
}

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// determine if a triangle can be made
//     Note:   For each side on a triangle, the side must be
//             shorter than the sum of the opposite two sides
if(side1 < (side2 + side3) &&    // make sure that side 1 is not too long
    side2 < (side1 + side3) &&    // make sure that side 2 is not too long
    side3 < (side1 + side2))    // make sure that side 3 is not too long
{
    triangle = good;            // mark this triangle as good
}
else
{
    triangle = bad;             // mark this triangle as bad
}

// print the results
cout << "It is ";              // print the first part of the sentence
if (triangle == bad)           // if this is a bad triangle
{
    cout << "NOT ";            // print the word NOT
}
cout << "possible to make a triangle with sides of "; // print rest of sentence
cout << side1 << ", " << side2 << ", and " << side3 << ".\n";

// check to see if they want to do it again
cout << "Do you wish to repeat the calculation? (Y or N) : ";
cin >> answer;

} while (answer == 'y' || answer == 'Y');

// let user know that its all over
cout << "\n\nEnd Program.\n";

return 0;
}

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