Introductory Programming Assignment
Numerical Analysis

This programming assignment should familiarize you with the C# programming environment as well as how to submit your work on OICLearning.com. Work on this assignment once you have completed all the tutorials linked from eclass.

Steps to follow - in this order:

1. Open the programming project:
   - Unzip the Introductory Project file linked from eclass. Simply double clicking the .zip file to open it will NOT suffice. It will not work properly in Visual Studio if you do this.
   - Double click the Introductory Project.sln file. This should open the project up in Visual Studio. You will need to use version dotnet 8.0 for all your programs this semester.
2. Identify and inspect the interface.
   - You will find the Solution Explorer on the right hand side bar of Visual Studio. Use the Solution Explorer to find the interface which you need to implement. Recall that all interfaces are named with a leading capital I. So the interface in this project is a file named ICalcs.cs. You should NOT make any changes to this file. However, you can inspect the interface to see what you are supposed to do in your implementation. You can open the interface (or any file in the file explorer) by double clicking the name of the file in the Solution Explorer.
3. Add the implementation file
   - Right click the name of the project (the bold name in the Solution Explorer) and select ADD and then in the sub-menu, select Class...
   - Select the Interface option and then, in the bottom area of this window pane, name the class the same name as the interface, except without the leading I. So this class should be named Calcs.cs
   - Click Add
4. Setup the inheritance
   (a) If the implementation class you just created does not automatically open then double click the its name in the Solution Explorer to open it.
   (b) Replace the word internal with the word public. This changes the class to a public class which has greater accessibility within the project.
   (c) Setup the inheritance from ICalcs by adding :ICalcs to the end of the line public class Calcs like you learned to do in one of the tutorials.
   (d) Click the little light bulb - usually on the left hand side of the screen - and tell it to implement the interface. This should copy all the functions that I specified in the interface to your implementation and give you space to write your code.
5. Determine what you need to program by reading the interface.
   - Implement the Discriminent which returns a type double and requires three inputs, a,b, and c, all of type double as well. So this function should return the value $b^2 - 4ac$.
   - The next function, Quadratic, returns a list of strings. It also accepts three doubles, a,b, and c. If you read the instructions above this function, you will see that you are returning two solutions -
     – the first solution is $\frac{-b+\sqrt{b^2-4ac}}{2a}$ and is stored in solution[0].
     – the second solution is $\frac{-b-\sqrt{b^2-4ac}}{2a}$ and is stored in solution[1].

     If both solutions are the same, then return the same value in both parts of the solution string. Note that you will have to type cast the solution to a string. Note that if you have calculated $s0 = \frac{-b+\sqrt{b^2-4ac}}{2a}$ then we would use

     solution[0]=s0.ToString();

to convert the double to a string. If there is no solution then return "No Solution" for both answers.

6. You can use the Program.cs file to put all your I/O. This can be used to help debug your program.
7. Submit your program
   - Create a zip file of your Calcs.cs file.
   - Using the link to OICLearning posted on eclass, navigate to the Introductory Program assignment.
   - Submit this zip file on OICLearning. Wait a little while (up to a few minutes) to see your grade. You can resubmit as much as you want until the deadline is passed. I will record your last score on eclass - so make sure that this is your highest score.