Homework 1

Conditional Logic

Solving Quadratic Equations

We want to write a program which does the following:

1. Have the user input the coefficients a,b, and c for a quadratic equation of the form $ax^2 + bx + c = 0$
2. Print the solution to the equation

For certain combinations of a,b, and c, the two solutions are: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. This solution breaks down, however, if $a = 0$, or if the term under the square root (the "discriminant") is negative. We therefore need to consider a number of different cases in order to solve the equation for all possible values of a,b, and c.

In your program, make sure to account for the following cases:

- If $a = 0$, then the quadratic equation becomes linear: $bx + c = 0$, which has only one solution: $x = -c/b$ (you may assume that b is not also zero)
- If a is not 0, then there are two additional cases:
  - The discriminant $b^2 - 4ac \geq 0$, in which case the two solutions are given by the quadratic formula
  - The discriminant $b^2 - 4ac < 0$, in which case the solution is complex; do not attempt to solve, simply print a message to the user stating that the solution is complex.