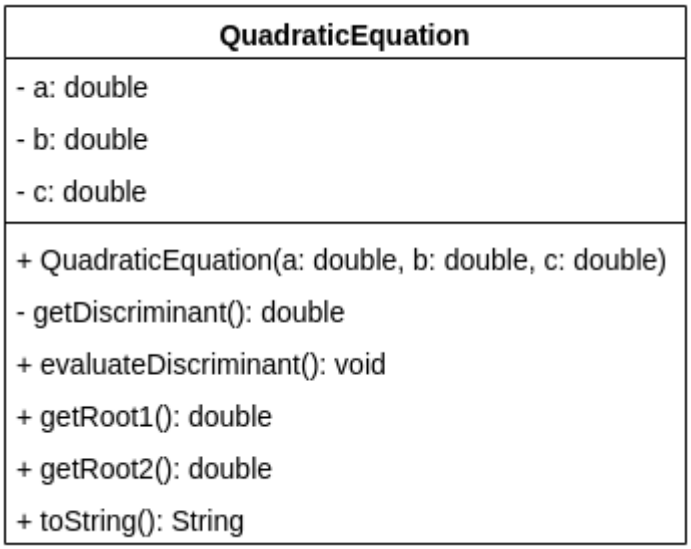
CSE 215: Programming Language II Lab
Week 5

Take Home Assignment

Design a class named `QuadraticEquation` for solving a quadratic equation which is of the form $ax^2+bx+c=0$.



The class should contain:

- Private data fields a , b , and c that represent three coefficients.
- A **single** constructor for the arguments for a , b , and c.
- A **private** method named `getDiscriminant()` that returns the discriminant, which is the value of b^2-4ac.
- A **public** method named `evaluateDiscriminant()` which prints out the following information using the value obtained from `getDiscriminant()`:
    - `getDiscriminant() > 0, "Two distinct solutions"`
    - `getDiscriminant() = 0, "One unique solution"`
    - `getDiscriminant() < 0, "No real solutions"`
- The **public** methods named `getRoot1()` and `getRoot2()` return the two roots of the equation. They return the following, respectively:

$$r_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \quad \text{and} \quad r_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

- However, if no real solutions exist, print out the message "`Not possible to calculate solutions since discriminant is negative`". You may have to return an arbitrary value in this case.
- The `toString()` method returns the details in the following tabular format:

Coefficient	Value
a	*value of a upto 3 decimal places*
b	*value of b upto 3 decimal places*
c	*value of c upto 3 decimal places*

In your driver class,

- construct three objects of `QuadraticEquation.` Use `Scanner` class to get the values of the coefficients for each object.
- Call the `evaluateDiscriminant()` method on each of the objects.
- Then, call the `getRoot1()` and `getRoot2()` methods on each of the objects and display the results.