Lab requirement for labs in Week 3

**Question 1: Design a class named QuadraticEquation for a quadratic equation . The class contains:**

* **Data fields a, b, and c that represents three coefficients.**
* **A constructor for the arguments for a, b, and c.**
* **Three get functions for a, b, and c.**
* **A function named getDiscriminant() that returns the discriminant, which is .**
* **The functions named getRoot1() and getRoot2() for returning two roots of the equation**

 and 

**These functions are useful only if the discriminant is non-negative. Let these functions return 0 if the discriminant is negative.**

**Draw the UML diagram for the class. Implement the class. Write a test program that prompts the user to enter values for , , and , and displays the result based on the discriminant. If the discriminant is positive, display the two roots. If the discriminant is 0, display the one root. Otherwise, display “The equation has no roots”.**

**Question 2. Write the following function that tests whether the array has four consecutive numbers with the same value.**

**bool isConsecutiveFour(vector<int> values)**

**Write a test program that prompts the user to enter a series of integers and displays true if the series contains four consecutive numbers with the same value. Otherwise, display false. Your program should first prompt the user to enter the input size, i.e., the number of values in the series.**

**Question 3. Write a function that finds the number of occurrences of a specified character in the string using the following header:**

**int count(const char s[], char a)**

**For example, count("Welcome", 'e') returns 2. Write a test program that reads a string and a character and displays the number of occurrences of the character in the string. Here is a sample run of the program:**

**<Output>**

**Enter a string: Welcome to C++**

**Enter a character: o**

**o appears in Welcome to C++ 2 times <End Output>**