Software Testing

Assignment 1

October 2021

One of your classmates was given a task to develop a java program to solve quadratic equations. The program has a class with function main () that creates a Quadratic objects.

As software testers Develop Black Box and White Box Testing for the application

The code below was developed using NetBeans IDE.

```
package quadraticapplication;

import static java.lang.Math.pow;

public class Quadratic {
    private int a;
    private int b;
    private int c;

    public int geta(){
        return a;
    }

    public int getb(){
        return b;
    }

    public int getc(){
        return c;
```

```
}

public void seta(int a){
    this.a =a;
}

public void setb(int b){
    this.b =b;
}

public void setc(int c){
    this.c = c;
}

public Quadratic(int a, int b, int c)
{
    this.a =a;
    this.b =b;
    this.c =c;
}

public Quadratic()
{
    this.a =1;
    this.b =0;
    this.c =0;
}


public double formulaX1()
{
    if (pow(b,2)>=4*a*c)
        return (-b+(pow((pow(b,2)-(4*a*c)),0.5)))/(2*a);
    else
```

```
        {
            return -999999;
        }
    }



public double formulaX2()
    {
         if (pow(b,2)>=4*a*c)
            return (-b-(pow((pow(b,2)-(4*a*c)),0.5)))/(2*a);



         else
        {
            return -9999999;
        }
    }



    //@override
    public String toString(){
        if (this.formulaX1()==this.formulaX2())
            return super.toString()+" a ="+a+" b ="+b+" c ="+c+" x ="+formulaX1();
        else if (pow(b,2)>=4*a*c)
            return super.toString()+" a ="+a+" b ="+b+" c ="+c+" x1
="+formulaX1()+" x2 ="+formulaX2();
        else
            return super.toString()+" a ="+a+" b ="+b+" c ="+c+" There are no real
roots for x1 and x2";
    }
}
```

SolveQuadratic.java

```
package quadraticapplication;
```

```
import static java.lang.Math.pow;
import java.util.Scanner;


public class SolveQuadratic
{
    static Scanner console = new Scanner(System.in);


    public static void main(String[] args) {
        int a;
        int b;
        int c;


        System.out.printf("For the quadratic formula equation ax^2 + bx + c =
0\nType an integer value for a: ");
        a=console.nextInt();
        System.out.printf("Type an integer value for b: ");
        b=console.nextInt();
        System.out.printf("Type an integer value for c: ");
        c=console.nextInt();


        Quadratic test = new Quadratic (a,b,c);
        System.out.println("\n");
        System.out.println("\nThe equation is "+test.geta()+"x^2 +
"+test.getb()+"x + "+test.getc()+" = 0");


        if (pow(b,2)>=4*a*c)
        {
            if (test.formulaX1()==test.formulaX2())
                System.out.println("The quadratic is a perfect square and the
value of x= "+test.formulaX1());
            else
            {
                System.out.println("x1= "+test.formulaX1());
                System.out.println("x2= "+test.formulaX2());
            }
```

```
        }


        else
            System.out.println("Error "+test.formulaX1()+". There are no real
roots.");
        System.out.println(test);


        System.out.println("\nAre there anymore equations? (Y/N)");
        char answer=console.next().charAt(0);


        while(answer=='Y' || answer=='y')
        {
            System.out.println("\nFor the quadratic formula equation ax^2 + bx + c
= 0");
            System.out.printf("Enter a value of a: ");
            a=console.nextInt();
            test.seta(a);
            System.out.printf("Enter a value of b: ");
            b=console.nextInt();
            test.setb(b);
            System.out.printf("Enter a value of c: ");
            c=console.nextInt();
            test.setc(c);
            System.out.println("\nThe equation is "+test.geta()+"x^2 +
"+test.getb()+"x + "+test.getc()+" = 0");



            if (pow(b,2)>=4*a*c)
            {
                if (test.formulaX1()==test.formulaX2())
                    System.out.println("The quadratic is a perfect square and the
value of x= "+test.formulaX1());
                else
                {
                    System.out.println("x1= "+test.formulaX1());
```

```
                    System.out.println("x2= "+test.formulaX2());
                }
            }

            else
                System.out.println("Error "+test.formulaX1()+". There are no real
roots.");
            System.out.println(test);

            System.out.println("\nAre there anymore equations (Y/N)");
            answer=console.next().charAt(0);
        }
    }
}
```