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papergrid
Date: 10 / 09 / 20

1. Develop a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminate $b^2 - 4ac$ is negative, display a message saying there are no real solutions.

```
import java.util.Scanner;
class quadratic
{
   public static void main (String args[])
   {
      double a, b, c;
      double r1, r2;
      double determinant;
      Scanner input = new Scanner (System.in);
      System.out.println("Enter the values of a,b,c :");
      a = input.nextDouble();
      b = input.nextDouble();
      c = input.nextDouble();
      determinant = (b*b) - (4*a*c);
      if (determinant > 0)
      {
         r1 = (-b + Math.sqrt(determinant)) / (2*a);
         r2 = (-b + Math.sqrt(determinant)) / (2*a);
         System.out.println("Real roots of the quadratic
         equation are : " + r1 + " and " + r2);
      }
      else if (determinant == 0)
      {
         r1 = (-b + Math.sqrt(determinant)) / (2*a);
         System.out.println(" They have equal real
         roots : " + r1 + "and " + r1);
      }
```

```
        else
        {
            System.out.println("There are no real solutions.");
        }
    }
}
```

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2. Develop a Java program to create a class Student with members usn, name, an array credits and an array marks. Include methods to accept and display details and a method to calculate SGPA of a student.

```
import java.util.Scanner;
class Student
{
    String name;
    String usn;
    int marks[] = new int[5];
    int credits[] = new int[5];
    int i,n;
    int grade=0, total=0;
    void get_data()
    {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter Student name : ");
        name = in.next();
        System.out.println("Enter Student USN : ");
        usn = in.next();
        System.out.println("Enter number of subjects:");
        n = in.nextInt();
        System.out.println("Enter subject credits and
        subject marks :");
        for(i=0; i<n; i++)
        {
            System.out.println("Credits for subject "+
            (i+1) + " : ");
            credits[i] = in.nextInt();
            System.out.println("Marks in subject "+
            (i+1) + " : ");
```

```
            marks[i] = in.nextInt();
        }
    }
    void calculate_sgpa()
    {
        for(i=0; i<n; i++)
        {
            if(marks[i] >=90 && marks[i] <=100)
                grade = 10;
            else if(marks[i]>=80 && marks[i]<90)
                grade = 9;
                .
                .
                .
                .
            else if(marks[i]>=0 && marks[i]<40)
                grade = 0;
            else
                System.out.println("Invalid marks entered.");
            total = total + (grade*credits[i]);
        }
        total = total/20;
        System.out.println("SGPA = " + total);
    }
    void stud_details()
    {
        System.out.println("Name : " + name);
        System.out.println("USN : " + usn);
        System.out.println("Marks & Credits of all subjects:");
        for(i=0; i<n; i++)
        {
            System.out.println("Subject Name (i+1) : " + name);
            System.out.println("Marks : " + marks[i] +
            ", credits : " + credits[i]);
        }
```

```
        calculate_sgpa();
    }
    public static void main(String args[])
    {
        Student obj = new Student();
        obj.get_data();
        System.out.println();
        obj.stud_details();
    }
}
```