

```
class roots
{
    public static void main(String args[])
    {
        int a,b,c,d,f=0;
        Scanner scan=new Scanner(System.in);
        System.out.println("\nEnter the values of a,b,c:");
        a=scan.nextInt();
        b=scan.nextInt();
        c=scan.nextInt();
        d=(b*b)-(4*a*c);
        if(d==0)
        {
            System.out.println("Roots are real and equal");
            f=1;
        }
        else if(d>0)
        {
            System.out.println("Roots are real and unequal");
            f=1;
        }
        else
        {
            System.out.println("Roots are imaginary");
            if(f==1)
            {
                float r1=(float)(-b+Math.sqrt(d)/(2*a));
                float r2=(float)(-b+Math.sqrt(d)/(2*a));
                System.out.println("Roots are:"+r1+","+r2);
            }
        }
    }
}
```

```
symbol:    method b(double)
location:  class Equation
3 errors
[poojaraghu@Poojas-MacBook-Pro Desktop % javac Equation.java
[poojaraghu@Poojas-MacBook-Pro Desktop % ls
Equation.class
Equation.java
Main.class
Main.java
Microsoft_Office_16.41.20091302_HomeStudent_Installer.pkg
dosbox.app
masm
roots.class
[poojaraghu@Poojas-MacBook-Pro Desktop % java Equation
Enter a,b,c value:
2 5 8
Imaginary root1: -5.0+ 6.244997998398398i
Imaginary root2: -5.0- 6.244997998398398i
poojaraghu@Poojas-MacBook-Pro Desktop % java Equation
Enter a,b,c value:
3 6 7
Imaginary root1: -9.0+ 10.392304845413264i
Imaginary root2: -9.0- 10.392304845413264i
poojaraghu@Poojas-MacBook-Pro Desktop %
```


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 discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

Algorithm:

- Steps:
- 1) Input the value of a, b, c .
 - 2) Calculate $d = b^2 - 4ac$.
 - 3) If $(d < 0)$
 Display that there are no real solutions.
 else if $(d = 0)$
 display that roots are equal. Calculate $r_1 = r_2 = (-b/2a)$
 else
 Display roots are real and calculate $r_1 = -b + d/2a$
 and $r_2 = -b - d/2a$
 - 4) print r_1 and r_2
 - 5) End program algorithm.

```
import java.util.*;
class roots
{
    public static void main(String args[])
    {
        int a, b, c, d, f = 0;
        Scanner scan = new Scanner(System.in);
        System.out.println("\n Enter the values of a, b, c: ");
        a = scan.nextInt();
        b = scan.nextInt();
        c = scan.nextInt();
        d = (b*b) - (4*a*c);
        if (d == 0)
        {
            System.out.println(" Roots are real and equal");
        }
    }
}
```

```
f=1;
}
else if (d>0)
{
    System.out.println("Roots are real and unequal");
    f=1;
}
else
    System.out.println("Roots are imaginary");
if (f==1)
{
    float x1 = (float)(-b + Math.sqrt(d) / (2*a));
    float x2 = (float)(-b - Math.sqrt(d) / (2*a));
    System.out.println("Roots are: " + x1 + ", " + x2);
}
}
}
```



```

import java.util.Scanner;
class Student
{
    private String USN;
    private String name;
    private int n;
    private double SGPA = 0;
    private int totalCredits = 0;
    private int credits[];
    private double marks[];
    Scanner ss = new Scanner(System.in);

    void Details()
    {
        System.out.println("Enter USN of the student");
        USN = ss.nextLine();
        System.out.println("Enter Name of the student");
        name = ss.nextLine();
        System.out.println("Enter no of subjects");
        n = ss.nextInt();
        credits = new int[n];
        marks = new double[n];
        System.out.println("*Enter details of the subjects:*");
        for(int i=0;i<n;i++)
        {
            System.out.println("Enter credits allotted to the subject "+(i+1));
            credits[i] = ss.nextInt();
            System.out.println("Enter marks in the subject "+(i+1));
            marks[i] = ss.nextDouble();
            Calculate(credits[i],marks[i],i);
        }
    }

    void Calculate(int credit,double mark,int j)
    {
        totalCredits = totalCredits + credit;
        if(mark>=90&&mark<=100)
            SGPA = SGPA + (10*credit);
        else if(mark>=80 && mark<=89)
            SGPA = SGPA + (9*credit);
        else if(mark>=70&&mark<=79)
            SGPA = SGPA + (8*credit);
        else if(mark>=60&&mark<=69)
            SGPA = SGPA + (7*credit);
        else if(mark>=50 && mark<=59)
            SGPA = SGPA + (6*credit);
        else if(mark>=40&&mark<=49)
            SGPA = SGPA + (5*credit);
        else
            System.out.println("Failed in Subject "+(j+1));
    }

    void Display()
    {
        System.out.println("Details of the Student");
        System.out.println("USN: "+USN);
        System.out.println("Name :"+name);
        System.out.println("SGPA of Student "+(SGPA/totalCredits));
    }
}

class Main1
{
    public static void main(String args[])
    {
        Student s1 = new Student();
        s1.Details();
        s1.Display();
    }
}

```

Desktop — -zsh — 127x29
[poojaraghu@Poojas-MacBook-Pro desktop % java Main1

Enter USN of the student

1BM19CS135

Enter Name of the student

Pooja

Enter no of subjects

4

Enter details of the subjects:

Enter credits allotted to the subject 1

2

Enter marks in the subject 1

82

Enter credits allotted to the subject 2

3

Enter marks in the subject 2

87

Enter credits allotted to the subject 3

5

Enter marks in the subject 3

81

Enter credits allotted to the subject 4

5

Enter marks in the subject 4

90

Details of the Student

USN: 1BM19CS135

Name :Pooja

SGPA of Student 9.333333333333334

poojaraghu@Poojas-MacBook-Pro desktop %

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 student.

```
import java.util.Scanner;
class Student
{
    private String USN;
    private String name;
    private int n;
    private double SGPA = 0;
    private int totalCredits = 0;
    private int credits[];
    private double marks[];
    Scanner ss = new Scanner(System.in);
    void Details()
    {
        System.out.println("Enter USN of the student");
        USN = ss.nextLine();
        System.out.println("Enter Name of the student");
        name = ss.nextLine();
        System.out.println("Enter no. of subjects");
        n = ss.nextInt();
        credits = new int[n];
        marks = new double[n];
        System.out.println("** Enter details of the subjects: **");
        for (int i = 0; i < n; i++)
        {
            System.out.println("Enter credits allotted to the subject " + (i+1));
            credits[i] = ss.nextInt();
            System.out.println("Enter marks in the subject " + (i+1));
            marks[i] = ss.nextDouble();
            Calculate(credits[i], marks[i], i);
        }
    }
}
```



```

    }
    }
    void Calculate(int credit, double mark, int j)
    {
        totalCredits = totalCredits + credit;
        if (mark >= 90 && mark <= 100)
            SGPA = SGPA + (10 * credit);
        else if (mark >= 80 && mark <= 89)
            SGPA = SGPA + (9 * credit);
        else if (mark >= 70 && mark <= 79)
            SGPA = SGPA + (8 * credit);
        else if (mark >= 60 && mark <= 69)
            SGPA = SGPA + (7 * credit);
        else if (mark >= 50 && mark <= 59)
            SGPA = SGPA + (6 * credit);
        else if (mark >= 40 && mark <= 49)
            SGPA = SGPA + (5 * credit);
        else
            System.out.println("Failed in subject " + (j+1));
    }
    void Display()
    {
        System.out.println("Details of the Student");
        System.out.println("USN: " + USN);
        System.out.println("Name: " + name);
        System.out.println("SGPA of Student " + (SGPA / totalCredits));
    }
}

class Main
{
    public static void main(String args[])
    {
        Student s1 = new Student();
        s1.Details();
        s1.Display();
    }
}

```