8. Quadratic formula :

```
import java.util.Scanner;
class quadratic
{
    int a,b,c;
    double x1, x2, d;
    void get()
{
    Scanner s = new Scanner (System.in);
    System.out.println("Enter the coefficients
of a,b,c");
    a = s.nextInt();
    b = s.nextInt();
    c = s.nextInt();
}
void compute()
{
    while (a==0)
{
    System.out.println("not a quadratic equation");
    System.out.print("Enter a non-zero value for a");
    Scanner s = new Scanner (System.in);
    a = s.nextInt();
}
d = b*b-4*a*c;
if(d>=0)
{
    x1 = (-b)/(2*a);
System.out.println("Roots are real & equal");
System.out.println("Root1 = Root2 = "+x1);
```

```
}
else if (d>0)
{
    r1 = ((-b) + (Math.sqrt(d))) /double (2*a);
    r2 = ((-b) - (Math.sqrt (d))) / double (2*a);
    system.out.println ("Roots are real and distinct");
    system.out.println ("Root 1 = "+r1+" Root 2 ="+r2);
}
else if (d<0)
{
    system.out.println ("Roots are imaginary");
    r1 (-b)/(2*a);
    r2 = Math.sqrt (-d)/(2*a);
    system.out.println ("Root 1 = "+r1+" + i"+r2);
    system.out.println ("Root 1 = "+r2+"-i"+r2);
}
}
}
class quadraticMain
{
    public static void Main (String args [])
    {
        Quadratic q = new quadratic ();
        q.getd();
        q.compute();
    }
}
```

Output : Enter the co-efficient equation

2 4 2

Not a quadratic equation

Enter a non-zero value for a

Roots are real & distinct.
Root 1 = -0.381966 Root 2 = -2.61803

121 121 121
Roots are imginary.

000
Not a qudratic eqn
Enter a non-zero value for a

1 0 0
Roots are real and equal
Root 1 = Root 2 0.0

12/12/23

```java
import java.util.Scanner;

class Quadratic {
    int a, b, c;
    double r1, r2, d;

    void getd() {
        Scanner s = new Scanner(System.in);
        System.out.println("Enter the coefficients of a, b, c");
        a = s.nextInt();
        b = s.nextInt();
        c = s.nextInt();
    }

    void compute() {
        while (a == 0) {
            System.out.println("Not a quadratic equation");
            System.out.println("Enter a non-zero value for a:");
            Scanner s = new Scanner(System.in);
            a = s.nextInt();
        }

        d = b * b - 4 * a * c;
        if (d == 0) {
            r1 = -b / (2.0 * a);
            System.out.println("Roots are real and equal");
            System.out.println("Root1 = Root2 = " + r1);
        } else if (d > 0) {
```

```
        if (d == 0) {
            r1 = -b / (2.0 * a);
            System.out.println("Roots are real and equal");
            System.out.println("Root1 = Root2 = " + r1);
        } else if (d > 0) {
            r1 = (-b + Math.sqrt(d)) / (2.0 * a);
            r2 = (-b - Math.sqrt(d)) / (2.0 * a);
            System.out.println("Roots are real and distinct");
            System.out.println("Root1 = " + r1 + " Root2 = " + r2);
        } else if (d < 0) {
            System.out.println("Roots are imaginary");
            r1 = -b / (2.0 * a);
            r2 = Math.sqrt(-d) / (2.0 * a);
            System.out.println("Root1 = " + r1 + " + i" + r2);
            System.out.println("Root2 = " + r1 + " - i" + r2);
        }
    }
}

class QuadraticMain {
    public static void main(String args[]) {
        Quadratic q = new Quadratic();
        q.getd();
        q.compute();
    }
}

```

LAB-2 Pgms :-

Date 19/11/23
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Q. Develop a Java program to create a class student with numbers 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 subject {
    int subjectMarks;
    int credits;
    int grade;
}

class student {
    string name;
    string usn;
    double SGPA;
    scanner s;
    subject [] subject;

student() {
    subjects = new subject[8];
    For (int i=0, i<8; i++) {
        subjects[i] = new subject();
    }
    s= new scanner (system.in);
}

void getStudentDetails () {
    system.out.print ("Enter Name :");
    name = s.nextline();
    system.out.print ("Enter USN: ");
    USN = s.nextline();
}
```

```
void getMarks() {
        for (int i=0; i<8 ; i++)
    {
    System.out.println("Enter details for subject" + (i+1)
                        + ":");
    System.out.print("Marks : ");
     subjects[i].subjectMarks = s.nextInt();
     System.out.print("credits : ");
     subjects[i].credits = s.nextInt();

if (subjects[i].subjectMarks >=90) {
     subject[i].grade =10;
} else if (subjects[i].subjectMarks >=75) {
     subjects[i].grade = 9;
} else if (subjects[i].subjectMarks >=60] {
     subjects[i].grade = 8;
} else if (subjects[i].subjectMarks >=50) {
     subjects[i].grade = 7;
} else if (subjects[i].subjectMarks >=40){
     subjects[i].grade = 6;
} else {
     subjects[i].grade = 0;
}
}
}
void computeSGPA() {
     double totalCredits = 0;
     double weightedSum = 0;

for (int i=0; i<8; i++) {
   totalCredits += subjects[i].credits;
weightedSum += subjects[i].grade* subjects[i]
                                  .credits;
```

```
    }
    SGPA = weighted sum / total credits ;
    }
}
public class Main {
        public static void main (String [] args)
    {
        Student s1 = new Student ();
        s1.getStudentDetails ();
        s1.getMarks ();
        s1. Compute SGPA ();

        System.out.println ("\n Result:");
        System.out.println ("Name:" + s1.name);
        System.out.println ("USN:" + s1.usn);
        System.out.println ("SGPA:" + s1.SGPA);
    }
}
```

⟹ Output:

```
Enter name : Pooja.
Enter USN : 1BM22CS194
Enter details for subject 1:
 Marks : 85
 credits : 4
Enter details for subject 2:
 Marks : 79
 credits : 4
Enter details for subject 3:
 Marks : 90
 credits : 3
```

Enter details for subject 5:
Marks : 88
Credits : 3
Enter details for subject 6:
Marks : 77
credits : 3
Enter details for subject 7:
Marks : 77
credits : 4
Enter the details for subject 8:
Marks : 98
Credits : 2

Result:
Name : Pooja.
USN : 1bM22cs194
SGPA : 9.11923.

19/12/23

```java
import java.util.Scanner;

class Subject {
    int subjectMarks, credits;
    char grade;
}

class Student {
    String name, usn;
    double SGPA;
    Scanner s;
    Subject[] subjects;

    Student() {
        int i;
        subjects = new Subject[8];
        for (i = 0; i < 8; i++)
            subjects[i] = new Subject();
        s = new Scanner(System.in);
    }

    void getStudentDetails() {
        System.out.println("Enter student name:");
        name = s.nextLine();
        System.out.println("Enter student USN:");
        usn = s.nextLine();
    }

    void getMarks() {
        for (int i = 0; i < 8; i++) {
            System.out.println("Enter marks for subject " + (i + 1) + ":");
            subjects[i].subjectMarks = s.nextInt();
            System.out.println("Enter credits for subject " + (i + 1) + ":");
            subjects[i].credits = s.nextInt();

            // Calculate grade based on marks
            if (subjects[i].subjectMarks >= 90) {
                subjects[i].grade = 'S';
            } else if (subjects[i].subjectMarks >= 80) {
                subjects[i].grade = 'A';
            } else if (subjects[i].subjectMarks >= 70) {
                subjects[i].grade = 'B';
            } else if (subjects[i].subjectMarks >= 60) {
```

```
            subjects[i].grade = 'B';
        } else if (subjects[i].subjectMarks >= 60) {
            subjects[i].grade = 'C';
        } else if (subjects[i].subjectMarks >= 50) {
            subjects[i].grade = 'D';
        } else if (subjects[i].subjectMarks >= 40) {
            subjects[i].grade = 'E';
        } else {
            subjects[i].grade = 'F';
        }
    }
}

void computeSGPA() {
    double totalCredits = 0;
    double weightedGradePoints = 0;

    for (int i = 0; i < 8; i++) {
        totalCredits += subjects[i].credits;

        switch (subjects[i].grade) {
            case 'S':
                weightedGradePoints += 10 * subjects[i].credits;
                break;
            case 'A':
                weightedGradePoints += 9 * subjects[i].credits;
                break;
            case 'B':
                weightedGradePoints += 8 * subjects[i].credits;
                break;
            case 'C':
                weightedGradePoints += 7 * subjects[i].credits;
                break;
            case 'D':
                weightedGradePoints += 6 * subjects[i].credits;
                break;
            case 'E':
                weightedGradePoints += 5 * subjects[i].credits;
                break;
            default:
                // 'F' grade, no points
                break;
```

```
                    break;
                default:
                    // 'F' grade, no points
                    break;
            }
        }

        SGPA = weightedGradePoints / totalCredits;
    }

    void displayResult() {
        System.out.println("\nStudent Details:");
        System.out.println("Name: " + name);
        System.out.println("USN: " + usn);
        System.out.println("SGPA: " + SGPA);
    }
}

public class Main {
    public static void main(String[] args) {
        Student s1 = new Student();
        s1.getStudentDetails();
        s1.getMarks();
        s1.computeSGPA();
        s1.displayResult();
    }
}
```

```
Microsoft Windows [Version 10.0.22000.2538]
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C:\Users\Admin\Desktop\java>javac Main.java

C:\Users\Admin\Desktop\java>java Main
Enter Name: pooja
Enter USN: 1bm22cs194
Enter details for Subject 1:
Marks: 85
Credits: 4
Enter details for Subject 2:
Marks: 79
Credits: 4
Enter details for Subject 3:
Marks: 90
Credits: 3
Enter details for Subject 4:
Marks: 84
Credits: 3
Enter details for Subject 5:
Marks: 88
Credits: 3
Enter details for Subject 6:
Marks: 77
Credits: 3
Enter details for Subject 7:
Marks:
77
Credits: 4
Enter details for Subject 8:
Marks: 98
Credits: 2

Result:
Name: pooja
USN: 1bm22cs194
SGPA: 9.192307692307692

C:\Users\Admin\Desktop\java>
```