// Roots of quadratic equation

1. Input a, b, c
2. d = b^2 - 4ac
3. if (d == 0)
   print ("Two equal roots").
   r1 = -b/2a
   r2 = r1
4. else if (d > 0)
   print ("Two distinct real roots")
   r1 = (-b + sqrt(d))/2a
   r2 = (-b - sqrt(d))/2a
5. else
   print ("No real roots")
6. exit

SYNTAX:

```
import java.util.*;
class quadeqs {
public static void main(String args[]) {
 double a, b, c, d, x1, x2;
 Scanner in = new Scanner(System.in);
 System.out.println("Enter the coefficient
                     of x^2, x and constant
                     term");
 a = in.nextDouble();
 b = in.nextDouble();
 c = in.nextDouble();
 d = (b*b) - (4*a*c);
 if (d>0) {
 x1 = (-b + Math.sqrt(d)) / (2*a);
 x2 = (-b - Math.sqrt(d)) / (2*a);
 System.out.println("Roots are real &
                     distinct");
 System.out.println("Roots are " + x1 + " and "
                     + x2);
 }
```

```
else if (d == 0){
    x1 = x2 = (-b/(2*a));
System.out.println("Roots are real and
                    equal");
System.out.println("Roots are "+x1+"and"+
                    x2);
}
else if(d<0){
  System.out.println("There are no
                    real solns");
}
}
}
```

EXPECTED OUTPUT:

```
Enter the coefficient of x^2, x, and constant
                    term
1
2
3
There are no real solutions
Enter the coefficient of x^2, x, and constant
1
2
1
Roots are real and equal
    Roots are -1.0 and -1.0
```

~~Import~~

Enter the coefficients of x^2, x, and constant term

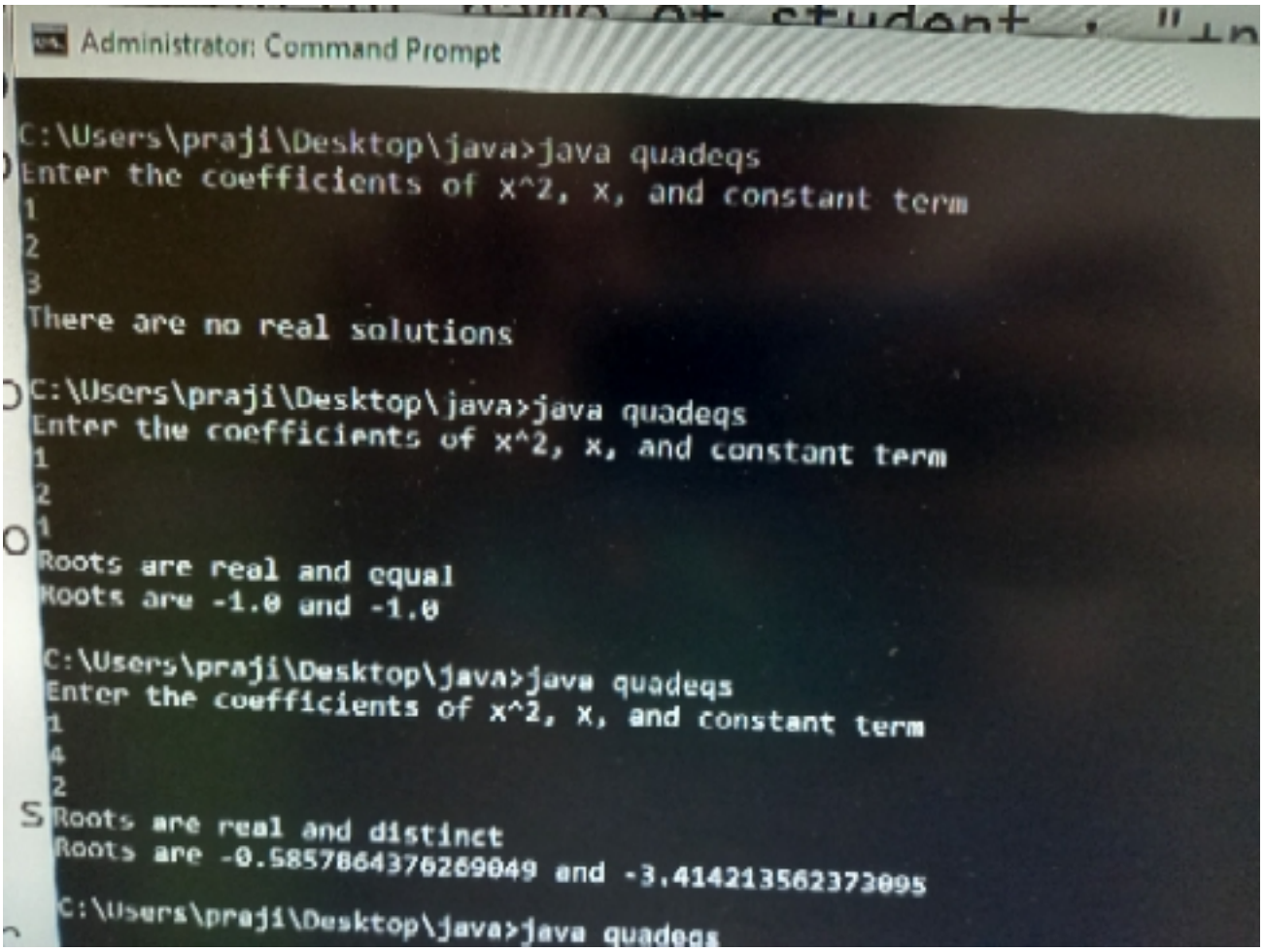
1

4

2

Roots are real and distinct

Roots are -0.585 and -3.4142


Administrator: Command Prompt
C:\Users\praji\Desktop\java>java quadeqs
Enter the coefficients of x^2, x, and constant term
1
2
3
There are no real solutions
C:\Users\praji\Desktop\java>java quadeqs
Enter the coefficients of x^2, x, and constant term
1
2
1
Roots are real and equal
Roots are -1.0 and -1.0
C:\Users\praji\Desktop\java>java quadeqs
Enter the coefficients of x^2, x, and constant term
1
4
2
Roots are real and distinct
Roots are -0.5857864376269049 and -3.4142135623730951
C:\Users\praji\Desktop\java>java quadeqs

// SGPA calculation

Algo

1. Take ~~input~~ ~~of~~ ~~name~~ name and usn as initial input

2. // SGPA

Algo:

1. Input n → no. of courses
2. Initialize array for marks and credits. from student class
3. Input name & USN → from user
4. Input the marks as along with credits from user
   ↳ call calculate() method
5. Calculate method :-

```
Total = 0
cred = 0
total = total + (c*credits[i]);
cred = cred + credits[i];
total = total / cred
return (total);
```

(6) Call display (method)
& display marks, credits
& SGPA.

SYNTAX:

```
(1) Import java.util.*;
class student {
    String usn, name;
    Static int credits[];
    Static double marks[];
    void input (int n)
    {
    Scanner sc= new Scanner(System.in);
    System.out.println("enter usn & name");
    usn = sc.nextLine();
    name = sc.nextLine();
    System.out.println("Enter marks along
                        with credits");
    for (int i=0 ; i<n ; i++)
    {
        marks[i] = sc.nextDouble();
        credits[i] = sc.nextInt();
        System.out.println();
    }
    }
```

```
double calculate(int n)
{
    int c, cred = 0;
    double tot, total = 0.0;
    for (int i = 0; i < n; i++)
    {
        tot = marks[i];
        if (tot >= 90)
            c = 10;
        else if (tot >= 80)
            c = 9
        else if (tot >= 70)
            c = 8
        else if (tot >= 60)
            c = 7
        else if (tot >= 50)
            c = 6
        else if (tot >= 40)
            c = 4
        else
            c = 0;
        total = total + (c * credits[i]);
        cred = cred + credits[i];
    }
    total = total/cred;
    return total;
}
```

```
void display(int n, double total)
{
System.out.println("name of student:"+
                                name);
System.out.println("no of subject:"+no);
System.out.println("marks of student with
                        Credits of course");
for(int i=0;i<n;i++)
{
System.out.println(marks[i]+" "+
                        credits[i]);
}
System.out.println("sgpa of student:"
                        +total);
}
public static void main(String args[])
{
Scanner sc = new Scanner(System.in);
student obj = new student();
System.out.println("enter no. of course");
int n = sc.nextInt();
credits = new int[n];
marks = new double[n];
obj.input(n);
double total = obj.calculate(n);
```

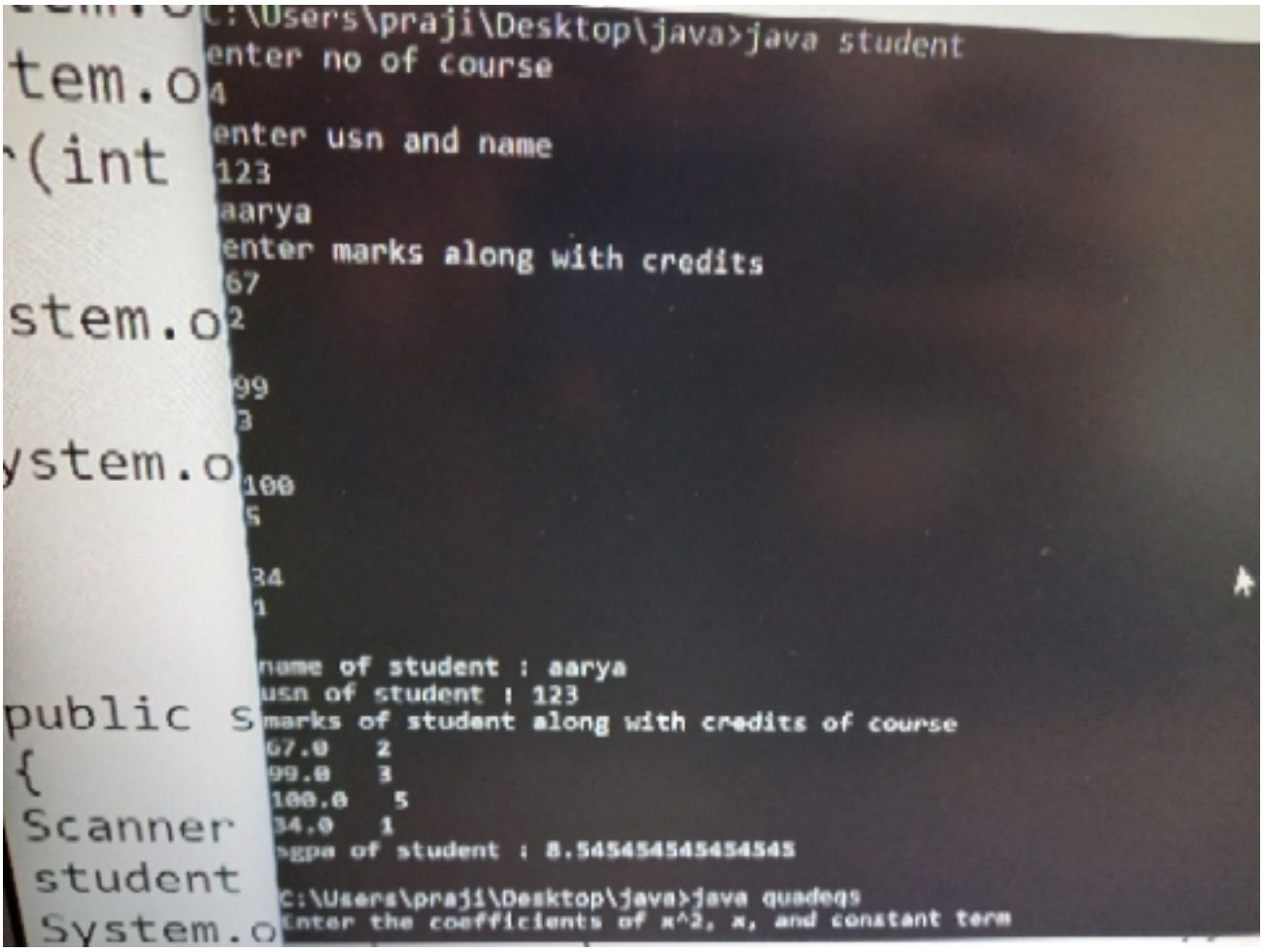
```
        obj.display(n,total);
    }
}
```

EXP OUTPUT:

```
Enter no. of course
4
enter usn and name
123
aarya
enter marks along with credits
67
2
89
3
100
5
34
1
name of student : aarya
usn of student : 123
marks of student along with
    credit of course
    67.0  2
    89.0  3
    100.0 5
```

34.01

sgpa of student :- 8.5454.


tem.o
(int
stem.o
ystem.o
public s
{
Scanner
student
System.o
C:\Users\praji\Desktop\java>java student
enter no of course
4
enter usn and name
123
aarya
enter marks along with credits
67
2
99
3
100
5
34
1
name of student : aarya
usn of student : 123
marks of student along with credits of course
67.0 2
99.0 3
100.0 5
34.0 1
sgpa of student : 8.545454545454545
C:\Users\praji\Desktop\java>java quadeqs
Enter the coefficients of x^2, x, and constant term