Lab Program:

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 stating that there are no real solutions.

```
Import java.util.Scanner;
public class Main {
public static void main(String[] args) {double a,b,c,
root1, root2; double det;

Scanner sc = new Scanner(System.in);
System.out.println("Enter the value of b:");
b = sc.nextDouble();
System.out.println("Enter the value of a:");
a = sc.nextDouble();
System.out.println("Enter the value of c:");
c = sc.nextDouble();

det = b*b - 4*a*c;
if (det >0) {
{ root1 = (-b + Math.sqrt(b*b - 4*a*c))/2*a;
System.out.println("First root is:" + root1);
System.out.println("Second root is:" + root2); }
else if (det == 0) {
root1 = -b/2*a);
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System.out.println("Both roots are same and are equal to :" + root1); }

else if (det < 0) }
System.out.println("Real roots don't exist");

}}}

Algorithm :

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double a, b, c, root1, root2, det

input a, b, c

det = b * b - 4 x a x b

if (det > 0)

root1 = (-b + $\sqrt{b \times b - 4ac}$)) 2 x a
root2 = (-b - $\sqrt{-b * b - 4ac}$)) 2 x a
print root1, root2

else if (det = 0)
root1 = -b / (2 x a)
print root1
else
print "Imaginary root"

End

LAB-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 calculate SGPA of a student.

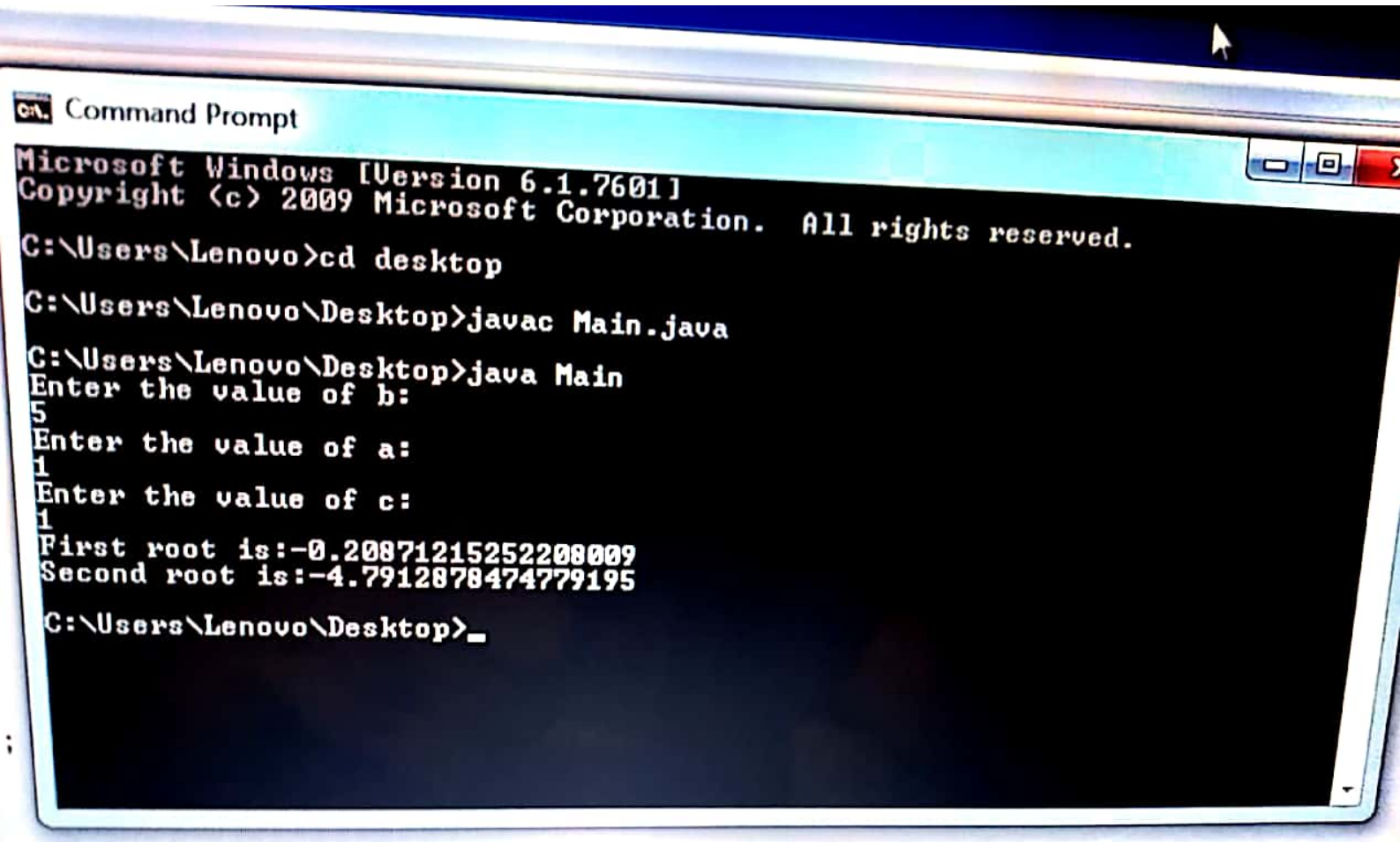
```
Import Java.util.Scanner;

Class Student {
private String USN;
private String name;
private int n;
private double SGPA = 0;
private int totalCredits = 0;
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();
int credits[] = new int[n];
double 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 subject "+
(i+1));
marks[i] = ss.nextInt();
Calculate(credits[i], marks[i], i); } }
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 * credits); else
System.out.println("Failed in subject "+(j+1));}
void display() {
System.out.println("Details of the student");
System.out.println("Name :"+name);
System.out.println("USN:"+USN);
System.out.println("SGPA of student"+(SGPA/totalCredits)); }}
public class Lab2 {
public static void main(String args[]) {
student s1 = new student();
s1.Details();
s1.Display(); } }
```

Algorithm:

Start
Input USN, Name, no. of subjects and the details of subjects ie Credits and marks as USN, name, n, credits[i], marks[i].
Set TotalCredits = TotalCredits + Credit
Set SGPA = SGPA + (Credit * number) where number = 10, 9, 8, 6, 7, 5 acc to marks.
Else print "Failed in subjects".
Print "Details of the student", name, USN and the calculated SGPA of the student.
End.




```
and are equal to:" +root1);

exist");
```