Lab Program 1

15/11/'22.

Program 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 stating that there are no real solutions.

```
import java.util.*;

class Quadratic
{
 public static void main(String arg[])
 {
  int a,b,c;
  Double d, r, r1, r2;
  Scanner sc=new Scanner(System.in);
  System.out.println("Enter the values of a, b and c");
  a=sc.nextInt();
  b=sc.nextInt();
  c=sc.nextInt();
  if (a==0)
  {
   System.out.println("It is not a Quadratic Equation!");
  }
  else
  {
   d=b*-4*a*c;
   if(d==0)
   {
```

```
r = -b/(2*a);
System.out.println("The roots are real and equal");
System.out.println("Root = "+r);
}
else if (d>0)
{
r1 = (-b + Math.sqrt(d)) / (2*a);
r2 = (-b - Math.sqrt(d)) / (2*a);
System.out.println("The roots are real and distinct");
System.out.println("R1 = "+r1+ "R2 = "+r2);
}
else
{System.out.println("Sorry! There are no real solutions. The roots are imaginary:");
r1 = -b/(2*a);
r2 = Math.sqrt(Math.abs(d))/(2*a);
System.out.println("R1 = "+r1+"+i"+r2+ "R2 = "+r1+"-i"+r2);
}}}
```

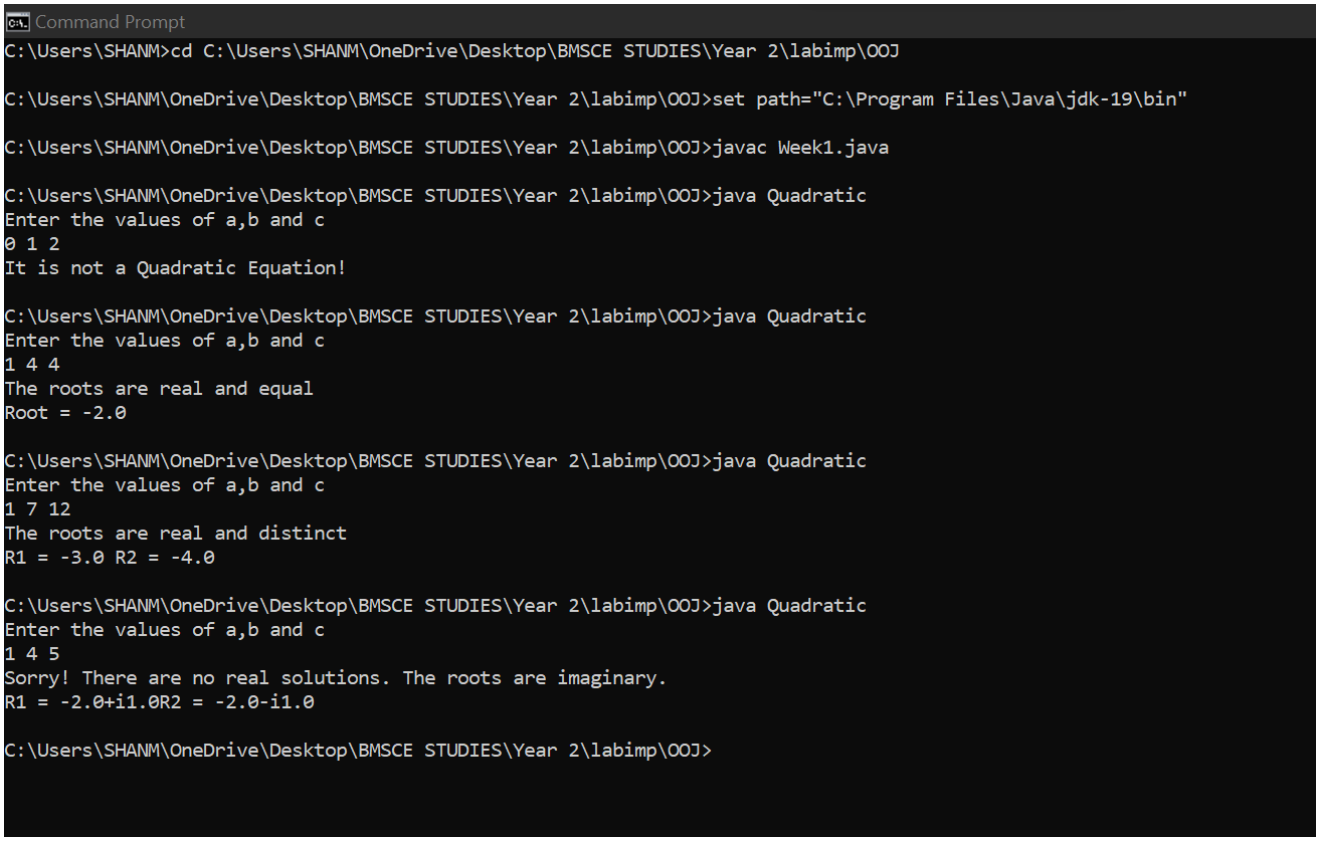
Output:-

```
Enter the values of a, b and c
0 1 2
It is not a Quadratic Equation!

Enter the values of a, b and c
1 4 4
The roots are real and equal
Root = -2.0

Enter the values of a, b and c
1 7 12
The roots are real and distinct
R1 = -3.0  R2 = -4.0
```

Enter the values of a, b and c
1 4 5
Sorry! There are no real solutions. The roots are imaginary.
R1 = -2.0 + i1.0 R2 = -2.0 - i1.0

Solution

OUTPUT:


Command Prompt
C:\Users\SHANM>cd C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>set path="C:\Program Files\Java\jdk-19\bin"
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>javac Week1.java
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>java Quadratic
Enter the values of a,b and c
0 1 2
It is not a Quadratic Equation!
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>java Quadratic
Enter the values of a,b and c
1 4 4
The roots are real and equal
Root = -2.0
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>java Quadratic
Enter the values of a,b and c
1 7 12
The roots are real and distinct
R1 = -3.0 R2 = -4.0
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>java Quadratic
Enter the values of a,b and c
1 4 5
Sorry! There are no real solutions. The roots are imaginary.
R1 = -2.0+i1.0R2 = -2.0-i1.0
C:\Users\SHANM\OneDrive\Desktop\BMSCE STUDIES\Year 2\labimp\OOJ>