```
else
{
System.out.println("The roots are imaginary");
}
}
else
{
System.out.println("Invalid Inputs");
}
}
```

OUTPUT

Enter the value of a 0
Enter the value of b 1
Enter the value of c 2
Invalid output
~~Enter the value of a~~

Enter the coefficient a, b, c 1, 2, 1
Roots are real and equal Roots are $x1 = x2 = -1.0$

Enter the coefficient a, b, c 1, 5, 1
The roots are real and distinct

Enter the coefficient a, b, c 1, 2, 3
The roots are imaginary

Program 1

1) Develop a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read a, b, c and use the quadratic formula.

```
import java.util.*;
import java.math.*;
public class Quadratic
{
public static void main (String args[])
{
Scanner in = new Scanner (System.in);
System.out.println("Enter the value of a");
double a = in.nextDouble();
System.out.println("Enter the value of b");
double b = in.nextDouble();
System.out.println("Enter the value of c");
double c = in.nextDouble();
if (a != 0)
{
double d = b*b - (4*a*c);
if (d > 0.0)
{ double s1 = (-b + Math.pow(d, 0.5)) / (2.0*a));
double s2 = (-b - Math.pow(d, 0.5)) / (2.0*a));
System.out.println("The roots are real and distinct");
System.out.println("The roots are " s1+" and "+s2);
}
else if (d == 0.0)
{
double s1 = -b / (2.0*a);
System.out.println("The roots are real and equal");
System.out.println("The root is "+s1);
```

```
crosoft Windows [Version 10.0.19043.2251]
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\Users\bmsce>cd C:\Users\bmsce\Desktop\1bm21cs056

\Users\bmsce\Desktop\1bm21cs056>javac quad.java

\Users\bmsce\Desktop\1bm21cs056>java Quad
ter the coefficient a,b,c



valid output

\Users\bmsce\Desktop\1bm21cs056>java Quad
ter the coefficient a,b,c



ots are real and equal
ots are r1=r2 -1.0

\Users\bmsce\Desktop\1bm21cs056>java Quad
ter the coefficient a,b,c



e roots are real and distinct
ots are real and distinct
e Roots are : -0.20871215252208009 -0.20871215252208009

\Users\bmsce\Desktop\1bm21cs056>java Quad
ter the coefficient a,b,c



e roots are imaginary

\Users\bmsce\Desktop\1bm21cs056>
```