updated program.

paperism
Date.

Q) Develop a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

```
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 eq");
      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*a);
            System.out.println("Roots are real and
                                equal");
            System.out.println("Root1 = Root2 =" + r1);
        }
        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 &
                                distict");
            System.out.println("Root1 = " + r1 + "Root2 =" + r2);
        }
    else if (d<0)
    {
        System.out.println("Roots are imaginary");
        r1 = (-b)/(2*a);
        r2 = Math.sqrt(-d)/(2*a);
        System.out.println("Root1 = "+r1+" + i" + r2);
        System.out.println("Root1 = " +r1+ " -i" + r2);
    }
  }
}
class QuadraticEq
{
    public static void main(String args[])
    {
        Quadratic q = new Quadratic();
        q.getd();
        q.compute();
    }
}
```

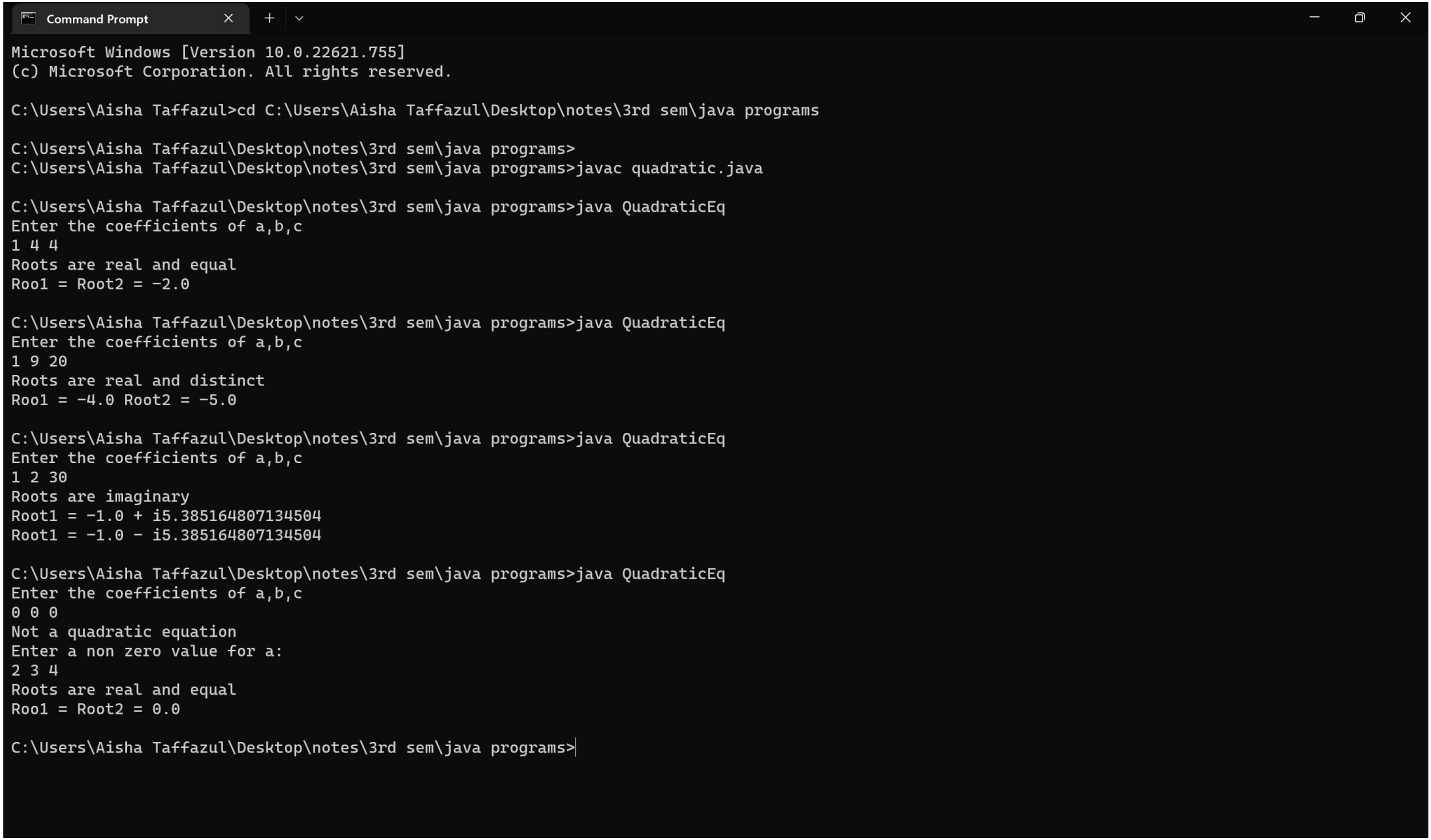
Output:

Enter the coefficients of a, b, c
1 4 4
Roots are real and equal
Root 1 = Root 2 = -2.0

Enter the coefficient of a, b, c
1 9 20
Roots are real and distinct
Root 1 = -4.0 Root 2 = -5.0

Enter the coefficient of a, b, c
1 2 30
Roots are imaginary
Root 1 = -1.0 + i 5.38516
Root 1 = -1.0 - i 5.38516

Enter the coefficients of a, b, c
0 0 0
Not a quadratic equation
Enter a non zero value for a:
2 3 4
Roots are real and equal
Root 1 = Root 2 = 0.0.


Command Prompt
Microsoft Windows [Version 10.0.22621.755]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Aisha Taffazul>cd C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>javac quadratic.java
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>java QuadraticEq
Enter the coefficients of a,b,c
1 4 4
Roots are real and equal
Roo1 = Root2 = -2.0
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>java QuadraticEq
Enter the coefficients of a,b,c
1 9 20
Roots are real and distinct
Roo1 = -4.0 Root2 = -5.0
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>java QuadraticEq
Enter the coefficients of a,b,c
1 2 30
Roots are imaginary
Root1 = -1.0 + i5.385164807134504
Root1 = -1.0 - i5.385164807134504
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>java QuadraticEq
Enter the coefficients of a,b,c
0 0 0
Not a quadratic equation
Enter a non zero value for a:
2 3 4
Roots are real and equal
Roo1 = Root2 = 0.0
C:\Users\Aisha Taffazul\Desktop\notes\3rd sem\java programs>