WEEK 1:

Develop a Java program that prints all real solutions to the quadratic equation ax2+bx+c=0. Read in a, b, c and use the quadratic formula. If the discriminate b2-4ac is negative, display a message stating that there are no real solutions.

Source Code:

```
import java.util.Scanner;

class Quadratic {
    float d;
    Scanner sc = new Scanner(System.in);

    void solver()

    {
        System.out.println("enter the values of a,b, and c");
        int a = sc.nextInt();
        int b = sc.nextInt();
        int c = sc.nextInt();


        if (a == 0) {
            System.out.println("invalid equation");
        }
        else{
            d= b*b - 4*a*c;
            System.out.println(d);
            System.out.println("the solutions are");
            if(d>0){
                System.out.println("roots are unique ");
                double r1 = (-b+Math.sqrt(d))/(2*a);
                double r2 = (-b-Math.sqrt(d))/(2*a);
                System.out.println(r1 +" " + r2);
            }
            if(d==0){
                System.out.println("roots are equal ");
                double r = -b/(2*a);
                System.out.println(r);
            }
            if(d<0){
                System.out.println("There are no real roots" );
            }
        }
```

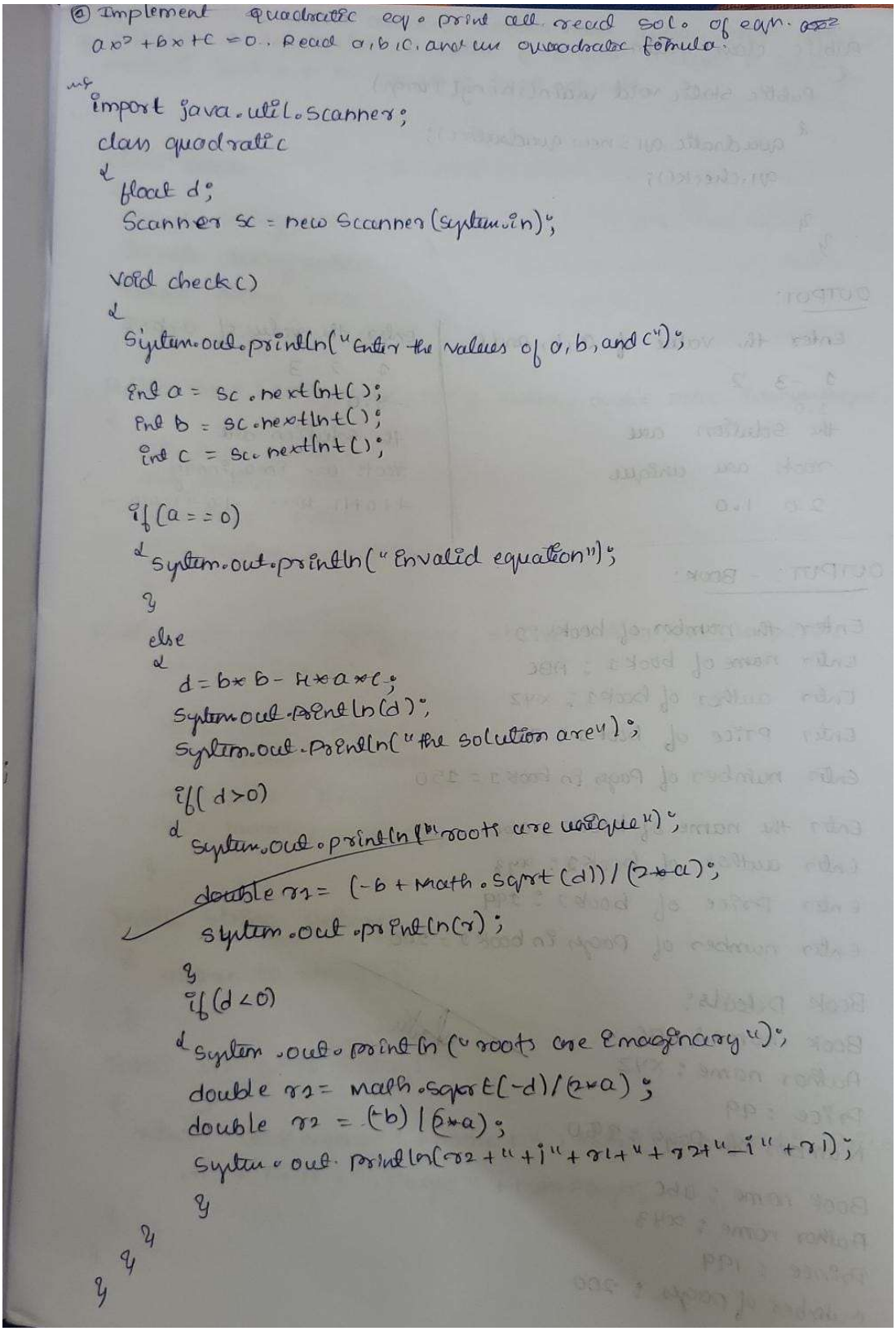
```
    }


}
```

```
public class QE {
    public static void main(String[] args) {
        Quadratic q1 = new Quadratic();
         q1.solver();

  }
}
```

OUTPUT:

```
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.26100.2605]
(c) Microsoft Corporation. All rights reserved.

C:\java>javac QE.java

C:\java>java QE
enter the values of a,b, and c
3 4 7
-68.0
the solutions are
There are no real roots

C:\java>javac QE.java

C:\java>java QE
enter the values of a,b, and c
1 2 1
0.0
the solutions are
roots are equal
-1.0

C:\java>javac QE.java

C:\java>java QE
enter the values of a,b, and c
2 6 4
4.0
the solutions are
roots are unique
-1.0 -2.0

C:\java>
```

OBSERVATION :



④ Implement quadratic eqn. print all real sol. of eqn. $ax^2+bx+c=0$. Read a, b, c and use quadratic formula.

```
import java.util.Scanner;
class quadratic
{
  float d;
  Scanner sc = new Scanner(System.in);

  void check()
  {
   System.out.println("Enter the values of a, b, and c");
   int a = sc.nextInt();
   int b = sc.nextInt();
   int c = sc.nextInt();

   if(a==0)
   {System.out.println("Invalid equation");
    }
    else
    {
      d=b*b-4*a*c;
      System.out.println(d);
      System.out.println("the solution are");
      if(d>0)
      {System.out.println("roots are unique");
       double r1= (-b+Math.sqrt(d))/(2*a);
       System.out.println(r1);
      }
      if(d<0)
      {System.out.println("roots are imaginary");
       double r1= Math.sqrt(-d)/(2*a);
       double r2 = (-b)/(2*a);
       System.out.println(r2+"+i"+r1+"\n"+r2+"-i"+r1);
      }
}
}
```

```
Public class main
{
    Public static void main(string[] args)
    {
        quadratic q1 = new quadratic();
        q1.check();
    }
}
```

OUTPUT:

Enter the value of a, b, and c

1 -3 2

1.0

the solution are

roots are unique

2.0 1.0

Enter the value of a, b, c

1 2 3

-8.0

the solution are

roots are imaginary

-1+0+i1.41... -1.0-i1.414...