Develop a Java program that prints all real solution to the quadratic equation ax^2+bx+c=0. Read in a,b,c and use the quadratic formula.If the discriminate is negative,display a message stating that there are no solutions.

```
Quadratic equation

import java.util.Scanner;
class quadratic {
  public static void main (String args[]){
    double a, b, c;
    double root, root1, root2, i, d;
    Scanner sc= new Scanner (System.in);
  System.out.println ("\n Enter the coefficients a, b, c");
      a= sc.nextDouble();
      b= sc.nextDouble();
      c= sc.nextDouble();
      d=  (b*b)-(4*a*c);

    if (a==0)
    { System.out.println("it's not a quadratic equation.
                          Enter valid inputs");
                        }
  else if (d>0)
    { root1= (-b+ Math.sqrt(d)/(2*a));
      root2= (-b- Math.sqrt(d)/(2*a));
    System.out.println ("the roots are real and
        distinct : root 1" + root1 + "root2 " + root2);
                        }
  else if (d<0)
    {   root= -b/(2*a);
        i= Math.sqrt(-d)/(2*a);
        System.out.println ("the roots are distinct
                    and imaginary");
      System.out.println ("root1" + root + "+" + "i" +i)
      System.out.println ("root2" + root + "-" + "(i" +i)
                        }
```

```
  else if (d==0)
    {   root1 = root2 = -b/(2*a);
    System.out.println ("the roots are real and equal
                        roots= " + root1 + " " + root2); }

  else
      { System.out.println ("roots are invalid"); }
                        }
                        }
```

Sample output

1) enter the coefficients a, b, c

0

9

8.

it's not a quadratic equation Enter valid

```
Scanner sc=new Scanner(System.in);
System.out.printl
a=sc.nextDouble()
b=sc.nextDouble()
c=sc.nextDouble()
d=(b*b)-(4*a*c);

if(a==0)
{System.out.print
}

else if(d>0)
{root1=(-b+Math.s
root2=(-b-Math.sq
System.out.printl
}

else if(d<0)
{
 root=-b/(2*a);

 i=Math.sqrt(-d)/
 System.out.print
```

Command Prompt

```
enter the coefficients a,b,c
2
3
4
the roots are distinct and imaginary
root1 -0.75+i1.1989578808281798
root2 -0.75-i1.1989578808281798

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
2
9
1
the roots are real and distinct:root1 -6.863999063670617root2 -11.13600093632938
3

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
0
3
4
it's not a quadratic equation

C:\Users\STUDENT\Desktop\1BM21CS044>
```

iii) enter the coefficients a, b, c

2

7

1

the roots are real and distinct :

root 1 -5.39921

root 2 -8.60078)

```
Scanner(System.in);
nt]
e()
e()
e()
);


int


h.s
.sc
nt]


;

d)/
int
```

Command Prompt

```
A
Exception in thread "main" java.util.InputMismatchException
        at java.base/java.util.Scanner.throwFor(Scanner.java:860)
        at java.base/java.util.Scanner.next(Scanner.java:1497)
        at java.base/java.util.Scanner.nextDouble(Scanner.java:2467)
        at quadratic.main(quadratic_equation.java:8)

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
2
3
4
the roots are distinct and imaginary
root1 -0.75+i1.1989578808281798
root2 -0.75-i1.1989578808281798

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
2
9
1
the roots are real and distinct:root1 -6.8639990636706 17root2 -11.13600936329383

C:\Users\STUDENT\Desktop\1BM21CS044>
```

ii) enter the coefficients a, b, c

4

5

6

the roots are distinct and imaginary

root 1 -0.625 + i 1.053268

root 2 -0.625 - i 1.053268

anner(System.in);

Command Prompt

```
        at quadratic.main(quadratic_equation.java:8)

C:\Users\STUDENT\Desktop\1BM21CS044>b
'b' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
A
Exception in thread "main" java.util.InputMismatchException
        at java.base/java.util.Scanner.throwFor(Scanner.java:860)
        at java.base/java.util.Scanner.next(Scanner.java:1497)
        at java.base/java.util.Scanner.nextDouble(Scanner.java:2467)
        at quadratic.main(quadratic_equation.java:8)

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
2
3
4
the roots are distinct and imaginary
root1 -0.75+i1.1989578808281798
root2 -0.75-i1.1989578808281798

C:\Users\STUDENT\Desktop\1BM21CS044>_
```

4- 4x2x2

iv) enter the coefficient a,b,c

2

4

2

the roots are real and equal roots : -1.0 , -1.0

Command Prompt

```
C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
4
5
6
the roots are distinct and imaginary
root1 -0.625+i1.0532687216470449
root2 -0.625-i1.0532687216470449

C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
2
7
1
the roots are real and distinct:root1 -5.399218940641788root2 -8.600781059358212


C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic

enter the coefficients a,b,c
2
4
2
the roots are real and equal roots=-1.0 -1.0

C:\Users\STUDENT\Desktop\1BM21CS044>
```