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)
  { root 1 = (-b + math.sqrt(d) / (2*a));
    root 2 = (-b - math.sqrt(d) / (2*a));
System.out.println (" the roots are real and distinct
                      : root 1 "+root1" + 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 ("root 2 " +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

(i) enter the coefficients a, b, c

0
3
4

it's not a quadratic equation. Enter valid input.

(ii) Enter the coefficients a, b, c.

2

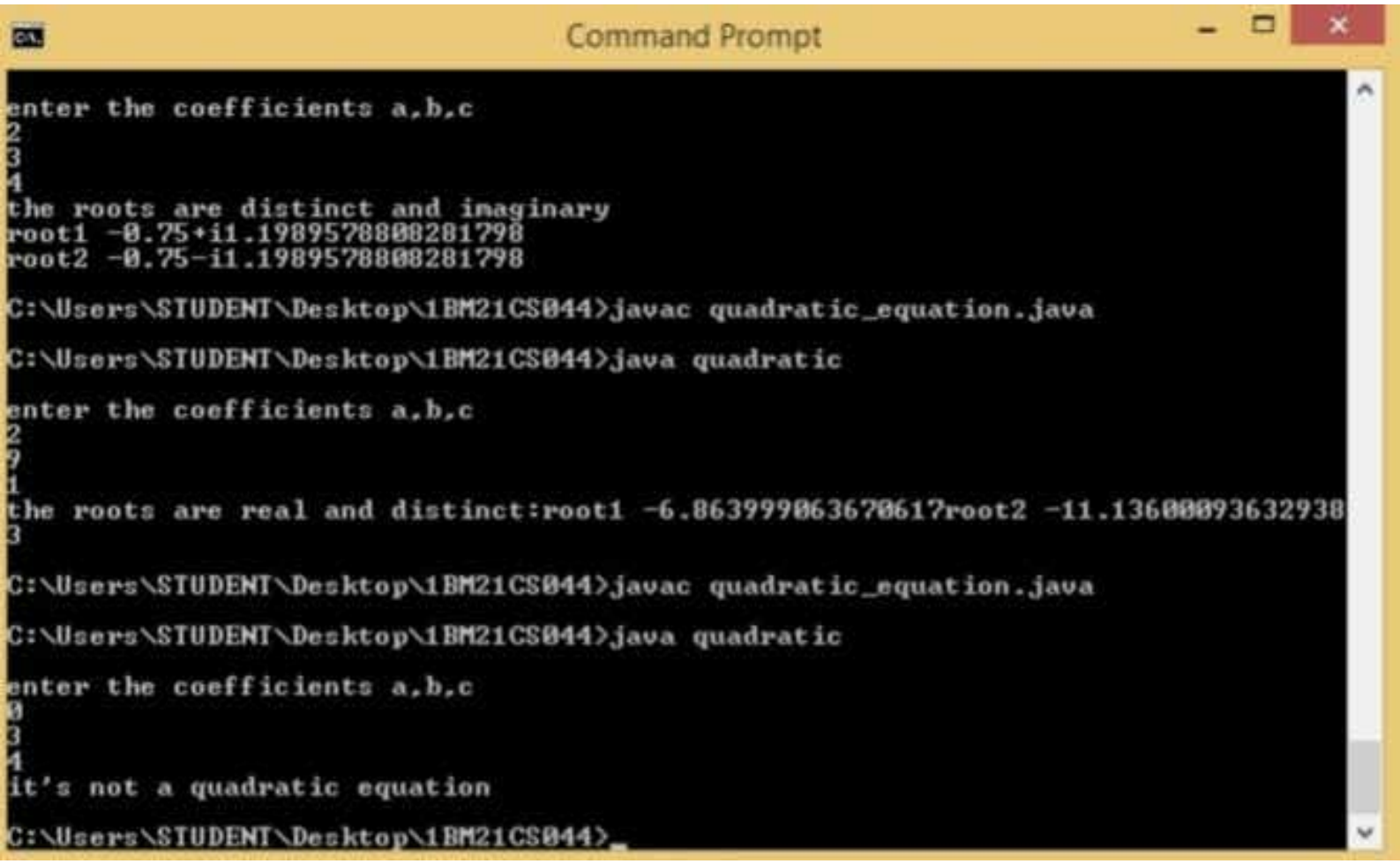
9

1

The roots are real and distinct:

root 1 = -6.8639906

root 2 = -11.136009


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 -6.8639990636706 17root2 -11.136000936329383
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

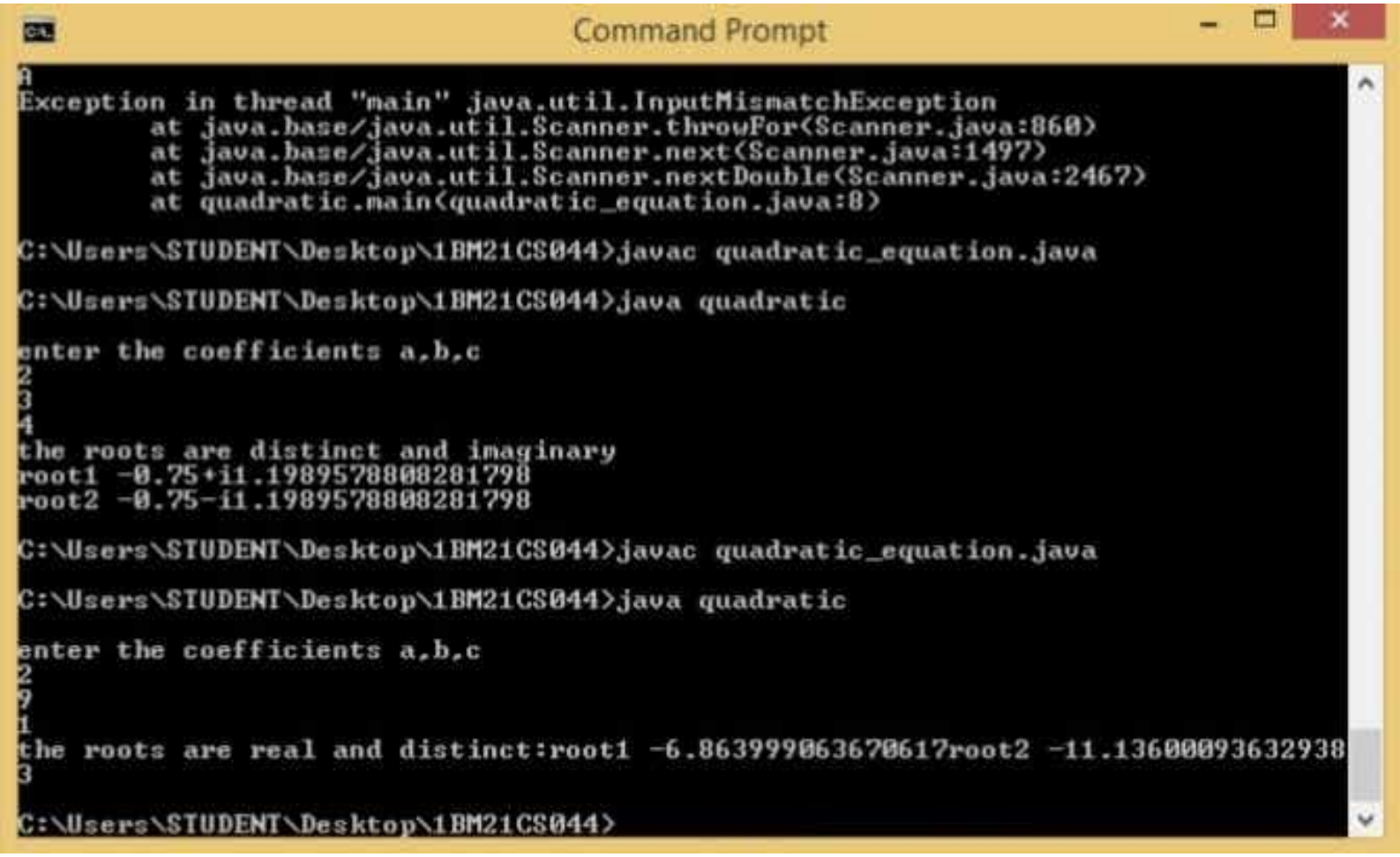
3

4

The roots are distinct and imaginary.

root 1 $-0.75 + i1.19895$

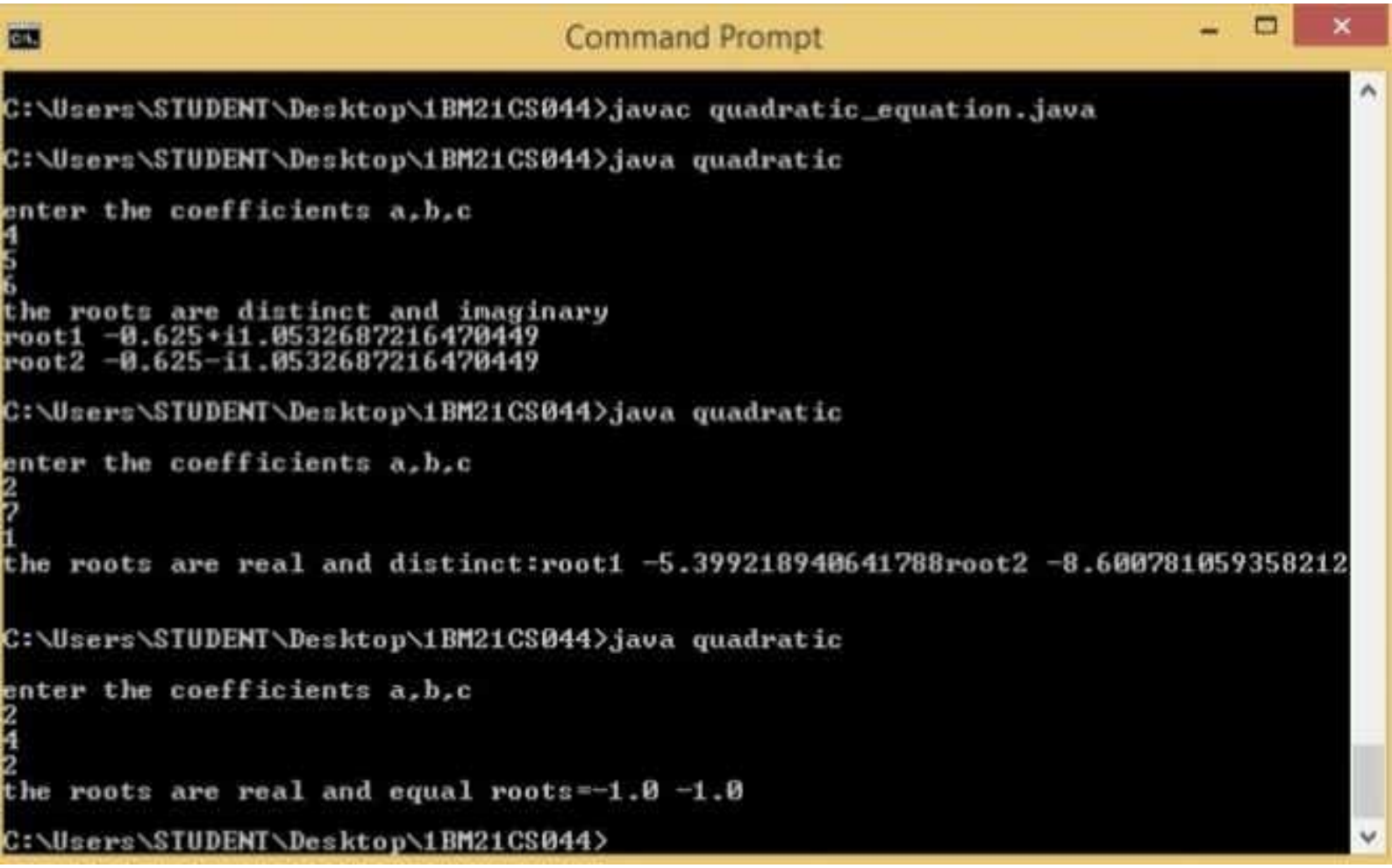
root 2 $-0.75 - i1.19895$


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 -6.863999063670617root2 -11.13600093632938
3
C:\Users\STUDENT\Desktop\1BM21CS044>

(iv) enter the coefficients 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>