```java
1 import components.simplereader.SimpleReader;

5
6 /**
7  * A program that computes the square root of a number using Newton Iteration
8  *
9  * @author VishalKumar
10  *
11  */
12 public final class Newton3 {
13
14     /**
15      * Private constructor so this utility class cannot be instantiated.
16      */
17     private Newton3() {
18     }
19
20     /**
21      * Computes estimate of square root of x to within relative error 0.01%.
22      *
23      * @param x
24      *            positive number (or 0) to compute square root of
25      * @return estimate of square root
26      */
27     private static double sqrt(double x, double epsilon) {
28         double r = x;
29         // exception for when user wants to calculate the root of 0
30         if (x == 0.0) {
31             return 0.0;
32         } else {
33             while (!(((r * r) - x) / x < (epsilon * epsilon))) {
34                 r = ((r + (x / r)) / 2);
35             }
36         }
37         return r;
38     }
39
40     /**
41      * Main method.
42      *
43      * @param args
44      *            the command line arguments
45      */
46     public static void main(String[] args) {
47         SimpleReader in = new SimpleReader1L();
48         SimpleWriter out = new SimpleWriter1L();
49
50         // boolean to store whether or not user wants to do another round
51         boolean another = false;
52
53         // compute if user would like to calculate another square root
54         out.print("Would You like to calculate a square root? (y/n) ");
55         char answer = in.nextLine().charAt(0);
56
57         if (answer == 'y') {
58             another = !another;
59         }
60
```

```java
61        while (another) {
62            out.print("Enter a positive double (#.##): ");
63            double num = in.nextDouble();
64            // get desired epsilon value from user
65            out.print("Enter desired epsilon: ");
66            double epsilion = in.nextDouble();
67            double rootNum = sqrt(num, epsilion);
68            out.println("The square root of " + num + " is " + rootNum);
69
70            out.print(
71                    "Would You like to calculate another square root? (y/n): ");
72            answer = in.nextLine().charAt(0);
73
74            if (answer != 'y') {
75                another = !another;
76            }
77
78        }
79        out.println("Goodbye!");
80        /*
81         * Close input and output streams
82         */
83        in.close();
84        out.close();
85    }
86
87 }
88
```