```
 1 import components.simplereader.SimpleReader;
 5
 6 /**
 7  * Put a short phrase describing the program here.
 8  *
 9  * @author Put your name here
10  *
11  */
12 public final class Newton4 {
13
14     /**
15      * Private constructor so this utility class cannot be
   instantiated.
16      */
17     private Newton4() {
18     }
19
20     /**
21      * y Computes estimate of square root of x to within relative
   error 0.01%.
22      *
23      * @param x
24      *            positive number to compute square root of
25      * @return estimate of square root
26      */
27     private static double sqrt(double x, double error) {
28         double guess = x;
29         error /= 100;
30         if (x == 0) {
31             return 0;
32         } else {
33             while (Math.abs(guess * guess - x) / x > error * error)
   {
34
35                 guess = (guess + x / guess) / 2;
36             }
37         }
38
39         return guess;
40     }
41
42     /**
43      * Main method.
44      *
```

```
45      * @param args
46      *             the command line arguments
47      */
48     public static void main(String[] args) {
49         SimpleReader in = new SimpleReader1L();
50         SimpleWriter out = new SimpleWriter1L();
51 
52         String answer;
53         out.println("Value of error: ");
54         double error = in.nextDouble();
55         out.println("Enter number to calculate square root of: ");
56         double number = in.nextDouble();
57         while (number >= 0) {
58             double sqrtOfNum = sqrt(number, error);
59             out.println("Square root of " + number + " is " +
   sqrtOfNum);
60             out.println("Enter number to calculate square root of:
   ");
61             number = in.nextDouble();
62         }
63 
64         in.close();
65         out.close();
66     }
67 
68 }
69 
```