

```
1 import components.naturalnumber.NaturalNumber;
2
3 /**
4  * Put a short phrase describing the program here.
5  *
6  * @author Vaishnavi Kasabwala
7  *
8  */
9 public final class Hailstone3 {
10     /**
11      * Private constructor so this utility class cannot be instantiated.
12      */
13     private Hailstone3() {
14     }
15
16     /**
17      * Generates and outputs the Hailstone series starting with the given
18      * {@code NaturalNumber}.
19      *
20      * @param n
21      *         the starting natural number
22      * @param out
23      *         the output stream
24      * @updates out.content
25      * @requires n > 0 and out.is_open
26      * @ensures out.content = #out.content * [the Hailstone series starting with
27      *         n]
28      */
29     private static void generateSeries(NaturalNumber n, SimpleWriter out) {
30         NaturalNumber x = new NaturalNumber2(n);
31         NaturalNumber zero = new NaturalNumber2(0);
32         NaturalNumber one = new NaturalNumber2(1);
33         NaturalNumber two = new NaturalNumber2(2);
34         NaturalNumber three = new NaturalNumber2(3);
35
36         int count = 1;
37         NaturalNumber max = new NaturalNumber2(x);
38
39         while (x.compareTo(one) != 0) {
40             out.print(x + ", ");
41             NaturalNumber temp = new NaturalNumber2(x);
42             if (temp.divide(two).compareTo(zero) == 0) { // when even
43                 x.divide(two);
44             } else { // when odd
45                 x.multiply(three);
46                 x.add(one);
47             }
48             count++;
49             if (x.compareTo(max) > 0) {
50                 max.copyFrom(x);
51             }
52         }
53         out.println(x);
54         out.println("Length of series: " + count);
55         out.println("The maximum value is: " + max);
56     }
57 }
58
59
60
61
62
```

```
63  /**
64   * Main method.
65   *
66   * @param args
67   *       the command line arguments
68   */
69  public static void main(String[] args) {
70      SimpleReader in = new SimpleReader1L();
71      SimpleWriter out = new SimpleWriter1L();
72
73      /*
74       * Put your main program code here; it may call myMethod as shown
75       */
76
77      out.println("Enter a positive integer: ");
78      int input = in.nextInt();
79      NaturalNumber n = new NaturalNumber2(input);
80
81      generateSeries(n, out);
82
83      /*
84       * Close input and output streams
85       */
86      in.close();
87      out.close();
88  }
89
90 }
91
```