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| LEARNING PROFILE FOR MathSequences (print3NSequence) | | | | | |
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# Problem Statement

Textbook example program.

# Description of the Code

Tests print3NSequences.

## print3NSequence

This subroutine prints a 3N+1 sequence to standard output, using startingValue as the initial value of N. It also prints the number of terms in the sequence. The value of the parameter, startingValue, must be a positive integer.

# Errors and Warnings

No errors.

# Sample Input and Output

## [Version 1.0]

This program will print out 3N+1 sequences

for starting values that you specify.

Enter a starting value.

To end the program, enter 0.

> 6

The 3N+1 sequence starting from 6

6

3

10

5

16

8

4

2

1

There were 9 terms in the sequence.

Enter a starting value.

To end the program, enter 0.

> -19

## [Version 1.1]

This program will print out 3N+1 sequences

for starting values that you specify.

Enter a starting value.

To end the program, enter 0.

> 10

The 3N+1 sequence starting from 10

10, 5, 16, 8, 4, 2, 1

There were 7 terms in the sequence.

Enter a starting value.

To end the program, enter 0.

> 34567

The 3N+1 sequence starting from 34567

34567, 103702, 51851, 155554, 77777, 233332, 116666, 58333, 175000, 87500,

43750, 21875, 65626, 32813, 98440, 49220, 24610, 12305, 36916, 18458, 9229,

27688, 13844, 6922, 3461, 10384, 5192, 2596, 1298, 649, 1948, 974, 487, 1462,

731, 2194, 1097, 3292, 1646, 823, 2470, 1235, 3706, 1853, 5560, 2780, 1390,

695, 2086, 1043, 3130, 1565, 4696, 2348, 1174, 587, 1762, 881, 2644, 1322, 661,

1984, 992, 496, 248, 124, 62, 31, 94, 47, 142, 71, 214, 107, 322, 161, 484,

242, 121, 364, 182, 91, 274, 137, 412, 206, 103, 310, 155, 466, 233, 700, 350,

175, 526, 263, 790, 395, 1186, 593, 1780, 890, 445, 1336, 668, 334, 167, 502,

251, 754, 377, 1132, 566, 283, 850, 425, 1276, 638, 319, 958, 479, 1438, 719,

2158, 1079, 3238, 1619, 4858, 2429, 7288, 3644, 1822, 911, 2734, 1367, 4102,

2051, 6154, 3077, 9232, 4616, 2308, 1154, 577, 1732, 866, 433, 1300, 650, 325,

976, 488, 244, 122, 61, 184, 92, 46, 23, 70, 35, 106, 53, 160, 80, 40, 20, 10,

5, 16, 8, 4, 2, 1

There were 174 terms in the sequence.

Enter a starting value.

To end the program, enter 0.

> -45

Positive integers only. Please try again.

> 1

The 3N+1 sequence starting from 1

1

There were 1 terms in the sequence.

Enter a starting value.

To end the program, enter 0.

> 2

The 3N+1 sequence starting from 2

2, 1

There were 2 terms in the sequence.

Enter a starting value.

To end the program, enter 0.

> 0

## [Version 1.2] Added IllegalArgumentException to print3NSequence

This program will print out 3N+1 sequences

for starting values that you specify.

Enter a starting value.

To end the program, enter 0.

> -5

Exception in thread "main" java.lang.IllegalArgumentException: Starting value must be positive.

at MathSequences.print3NSequence(MathSequences.java:58)

at MathSequences.main(MathSequences.java:45)

C:\Users\tyblu\AppData\Local\NetBeans\Cache\8.2\executor-snippets\run.xml:53: Java returned: 1

# Discussion

No errors.

My algorithm to limit output text over 80 characters wide seems to work well. Maybe I should make it a method in System.out or TextIO. It’s better than that proposed in Eck pp 159-160.