###

**34th Annual High School Programming Contest**

| **Sponsored by** |  |
| --- | --- |

##### April 8, 2022

###### Gold Problem #3: Repeating Binary Fractions

Background Information: In math class, a repeating decimal pattern can be represented as a rational number in lowest terms *a/b*, where *a*, *b* are integers and *a* is non-zero. For example the repeating decimal 0.36363636… is equal to 36/99, or 4/11 in lowest terms. The principle is the same with repeating binary patterns (patterns in base 2 only consisting of zeros and ones).

Your program will be given the repeating binary pattern immediately following the binary point of a number. It will output the fractional, lowest terms, equivalent in base-10.

###### Programming Problem:

Input:  A sequence of 0’s and 1’s that represent the repeated portion of a binary fraction up to 30 binary digits.

Output: The equivalent base-10 fraction in lowest terms, written in A/B format.

###### Example 1: Input:

######  0011

######  Output:

1/5

###### Example 2: Input:

######  01

######  Output:

1/3

 Example 3: Input:

 0000000000011110

 Output:

 2/4369