

Problem C. Collatz

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 256 mebibytes

Collatz function f is defined on positive integers as follows:

$$\begin{cases} f(x) = \frac{x}{2}, & \text{if } x \bmod 2 = 0, \\ f(x) = 3 \cdot x + 1, & \text{otherwise.} \end{cases}$$

Let us define a *Collatz sequence* of a number x as $x, f(x), f(f(x)), \dots$. For example, for 10 it looks like 10, 5, 16, 8, 4, 2, 1, 4, 2, 1, \dots . The *Collatz hypothesis* states that for any positive integer, its Collatz sequence will eventually reach the “4, 2, 1” loop.

This problem has not yet been solved, so we won’t ask you to prove or disprove the hypothesis. Just find the position of the first 1 in the Collatz sequence of a random number. You can find the exact meaning of the word “random” for this problem in the Notes section below.

Input

The first and only line of input contains an integer n in binary notation ($1 \leq n \leq 2^{200000}$). There are no leading zeroes.

Output

Print one integer: the position of the first occurrence of 1 in the Collatz sequence of n . Sequence elements are numbered starting from zero. Although the input is random, it is guaranteed that the answer for each test is finite.

Example

standard input	standard output
1010	6

Note

There are three categories of tests:

1. samples;
2. “small” tests: $n \leq 2^{1000}$, n is random, seed is selected manually by the jury;
3. “large” tests: no additional constraints, n is random, seed is selected randomly without studying the structure of the resulting test.

Here, “ n is random” means “length of n is selected manually, the first digit is 1, all other digits are uniformly and independently set to zero or one using some pseudo-random number generator”.