H: Pseudo-Random Number Generator

Time limit: 0.3 second



Donald loves nature. Being a programmer, Donald writes programs to simulate the growth of trees or to build realistic 3D landscapes. For this purpose, Donald needs a good pseudo-random number generator. He devises the following method to produce an infinite sequence of 40-bit unsigned integers (the lines in green are comments).

$$\begin{array}{rcll} M & \coloneqq & 1 << 40 & // = 2^{40} = 1\,099\,511\,627\,776 \\ S(0) & \coloneqq & \texttt{0x600DCAFE} & // = 1\,611\,516\,670 \\ S(n+1) & \coloneqq & (S(n) + (S(n) >> 20) + 12345) \ \% \ M & \end{array}$$

On the last line, $x >> 20$ denotes the quotient of the Euclidean division of x by 2^{20} and $x \ \% \ M$ denotes the remainder of the Euclidean division of x by M.

As a very first test to decide if this is indeed a good pseudo-random number generator, Donald wishes to count the number of even values produced by this sequence, in order to check whether this is close enough to 50%. Your help will be welcome.

Input

The input consists of a single line, containing an integer N.

Limits

The input satisfies $0 \leqslant N < 2^{63}$.

Output

The output should contain a single line with a single integer corresponding to the number of even values in the sequence $S(0), S(1), \ldots, S(N-1)$.

Sample Input 1

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3
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Sample Output 1

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2
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Sample Input 2

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500000000
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Sample Output 2

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250065867
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