

Binary [I]

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 100 · problem code: binary1 · author: glipR

This set of problems is centered around a sequence generated in the following manner:

1. Take all natural numbers in increasing order
2. Replace each natural number with its binary representation
3. Concatenate these into a single sequence

For example, the first 4 natural numbers generate the first 8 digits in the sequence: `11011100`.

The first digit is `1`, for `1`. The next two are `10`, for `2`. The next two are `11`, for `3`, and the final three are `100`, for `4`.

In this first problem, we just want to find the value of the "ith" value in the sequence. So the answer for `1` would be `1`, for `2` would be `1`, for `3` would be `0`, and so on. The bitstring above is the answers for the inputs `1` through to `8`.

Input

Input will consist of a single natural number i .

Output

Output a single 0 or 1, representing the value of the sequence at (1-indexed) index i .

Constraints

- $1 \leq i \leq 10^{18}$

Examples

Input

3

Output

0

Input

4

Output

1

Input

8

Output

0