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Power Hungry Cows

Language:

Time Limit: 1000MS **Memory Limit:** 30000K
Total Submissions: 5646 **Accepted:** 1397

Description

FJ's cows would like to be able to compute integer powers P ($1 \leq P \leq 20,000$) of numbers very quickly, but need your help. Because they're going to be computing powers of very large numbers, they can only keep around two work variables for intermediate results.

The first of those work variables is initialized to the number (denoted x) for which they are calculating the power; the other is initialized to 1. The cows can both multiply and divide any pair of the work variables and store the result in any work variable, but all results are stored as integers.

For example, if they want to compute x^{31} , one way to perform the calculation is:

WV1 WV2

Start: x 1

Multiply first by first, store in second: x x^2

Multiply second by second: x x^4

Multiply second by second: x x^8

Multiply second by second: x x^{16}

Multiply second by second: x x^{32}

Divide second by first: $x \quad x^{31}$

Thus, x^{31} can be computed in six operations. Given the power to be computed and the number of work variables, find the minimum number of operations to calculate the power.

Input

A single line with one integer: P.

Output

A single line with a single integer that is the minimum number of operations it requires to compute the power.

Sample Input

31

Sample Output

6

Source

USACO 2002 February

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