Barrett Reduction

Time limit: *500 ms*
Memory limit: *256 MB*

The $\mathrm{C}{+}{+}$ compiler optimizes the division by a constant D by multiplying your number by a constant A and then shifting the result B bits. This process is called Barrett reduction.

In this challenge we'll consider the division of an `unsigned 32 bit integer` by another `unsigned 32 bit integer` .

Given A and B, your task is to find the minimum possible value of D, for which the division is correct.

Note: it's guaranteed that for the given values A and B there exists an integer D such that for every number $0 \le X < 2^{31}$, $\lfloor \frac{X}{D} \rfloor = \lfloor \frac{X \times A}{2^B} \rfloor$, where $\lfloor X \rfloor$ represents the floor (integer part) of the result.

E.g: $\lfloor 0.4 \rfloor = 0$, $\lfloor 6.8 \rfloor = 6$.

Note that the challenge only uses unsigned integers, so there are no problems regarding using floor on negative numbers.

Standard input

The first line contains two integers A and B.

Standard output

The first line should contain one integer D.

Constraints and notes

- $0 \le A < 2^{32}$
- $0 \le B \le 63$
- $1 \le D < 2^{31}$

Input	**Output**	**Explanation**

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3435973837 35	10	Here are some examples of divisions.

$\lfloor \frac{5}{10} \rfloor = 0$

$\lfloor \frac{5 \times 3435973837}{2^{35}} \rfloor = \lfloor \frac{17179869185}{2^{35}} \rfloor = 0$

$\lfloor \frac{17}{10} \rfloor = 1$

$\lfloor \frac{17 \times 3435973837}{2^{35}} \rfloor = \lfloor \frac{58411555229}{2^{35}} \rfloor = 1$

$\lfloor \frac{35}{10} \rfloor = 3$

$\lfloor \frac{35 \times 3435973837}{2^{35}} \rfloor = \lfloor \frac{120259084295}{2^{35}} \rfloor = 3$