Sequence

You are given the sequence of all K-digit binary numbers: 0, 1,..., 2^K-1. You need to fully partition the sequence into M chunks. Each chunk must be a consecutive subsequence of the original sequence. Let S_i ($1 \le i \le M$) be the total number of 1's in all numbers in the ith chunk when written in binary, and let S be the maximum of all S_i, i.e. the maximum number of 1's in any chunk. Your goal is to minimize S.

Input

In the first line of input, two numbers, K and M ($1 \le K \le 100$, $1 \le M \le 100$, $M \le 2^K$), are given, separated by a single space character.

Output

In one line of the output, write the minimum S that can be obtained by some split. Write it without leading zeros. The result is not guaranteed to fit in a 64-bit integer.

Example

Input:
3 4

Output:
4