

E. Subsequences Return

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Assume that $s_k(n)$ equals the sum of digits of number n in the k -based notation. For example, $s_2(5) = s_2(101_2) = 1 + 0 + 1 = 2$, $s_3(14) = s_3(112_3) = 1 + 1 + 2 = 4$.

The sequence of integers a_0, \dots, a_{n-1} is defined as $a_j = s_k(j) \bmod k$. Your task is to calculate the number of distinct *subsequences* of sequence a_0, \dots, a_{n-1} . Calculate the answer modulo $10^9 + 7$.

Sequence a_1, \dots, a_k is called to be a *subsequence* of sequence b_1, \dots, b_l , if there is a sequence of indices $1 \leq i_1 < \dots < i_k \leq l$, such that $a_1 = b_{i_1}, \dots, a_k = b_{i_k}$. In particular, an empty sequence (i.e. the sequence consisting of zero elements) is a subsequence of any sequence.

Input

The first line contains two space-separated numbers n and k ($1 \leq n \leq 10^{18}$, $2 \leq k \leq 30$).

Output

In a single line print the answer to the problem modulo $10^9 + 7$.

Examples

input
4 2
output
11

input
7 7
output
128

Note

In the first sample the sequence a_i looks as follows: (0, 1, 1, 0). All the possible subsequences are:

(), (0), (0, 0), (0, 1), (0, 1, 0), (0, 1, 1), (0, 1, 1, 0), (1), (1, 0), (1, 1), (1, 1, 0).

In the second sample the sequence a_i looks as follows: (0, 1, 2, 3, 4, 5, 6). The subsequences of this sequence are exactly all increasing sequences formed from numbers from 0 to 6. It is easy to see that there are $2^7 = 128$ such sequences.

Codeforces Round #283 (Div. 1)

Finished

Practice



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→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Submit?

Language: GNU G++ 5.1.0

Choose file: [选择文件](#) 未选择任何文件

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.



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