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

Sequence $a_1, ..., a_k$ is called to be a *subsequence* of sequence $b_1, ..., b_l$, if there is a sequence of indices $1 \le i_1 < ... < i_k \le l$, such that $a_1 = b_{i_1}, ..., a_k = b_{i_k}$. 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 ($1 \le n \le 10^{18}$, $2 \le k \le 30$).

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.