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CTU Open Contest 2026

Birthday

`birthday.(c|cpp|py), Birthday.(java|kt)`

For his birthday, Míša received a small mathematician's kit: a prime number p , and a division machine. The machine can be loaded with a non-negative integer with at most k digits. Míša can then spin the crank, and the machine lights up if the loaded number is divisible by p .

Míša accidentally broke the machine, and now it only lights up when the loaded number is also a palindrome. Still, he gets excited every time the machine lights up for a number that it has never lit up for before.

How many times will Míša be excited? More precisely, for how many distinct integers will the division machine light up?

A palindrome is any integer that reads the exact same forwards and backwards when written in the most succinct format (without zeroes appearing in front of the first nonzero digit).

Input Specification

The input consists of one line with two space-separated integers k and p ($1 \leq k, p \leq 2000$). It is guaranteed that p is a prime.

Output Specification

Output a single integer, the number of distinct integers that the division machine will light up for. As the number can be large, output it modulo $10^9 + 7$.

Sample Input 1

2 3

Output for Sample Input 1

7

Sample Input 2

67 67

Output for Sample Input 2

943679912

In the first sample, the palindromes divisible by three with at most 2 digits are 0, 3, 6, 9, 33, 66, 99.