

Counting Palindromes

time limit per test: 1 second (1 second for Python)

memory limit per test: 976.6 megabytes

input: standard input

output: standard output

points: 100 · problem code: countingpalindromes

Bob works at the Cookie Factory, where cookies are baked in flavours numbered 1 to n . Every evening, a conveyor belt carries a sequence of n cookies past him.

Alice's birthday is coming, and so Bob wants to sneak her a gift, a palindromic cookie box.

A palindromic box of cookies is a subsequence (not necessarily continuous) of cookies chosen from the belt (in order) whose flavour sequence reads the same forwards and backwards.

Alice is picky though: she won't accept a box unless it contains at least x cookies.

Bob doesn't want to get fired, so he'll pack the smallest valid palindromic box possible so he's less likely to get caught.

Formally, for a given conveyor belt arrangement a , define $f(a)$ as the length of the shortest palindromic subsequence of length at least x . If no such subsequence exists, $f(a) = 0$.

Since the factory runs many different arrangements over many nights, Bob wants to know the sum of $f(a)$ over all possible conveyor belt arrangements of n cookies where each cookie can have a flavour from 1 to n . That is, there are n^n possible conveyor belt arrangements.

Help Bob figure out the sum (modulo $10^9 + 7$) before Alice's birthday.

Input

A single line containing two integers n and x .

Output

A single integer, the answer modulo $10^9 + 7$.

Constraints

- $1 \leq n \leq 10^6$
- $x \in \{2, 3\}$

Example 1

Input

```
2 2
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Output

```
4
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Explanation

There are 4 possible conveyor belt arrangements.

- $[1, 1] : f([1, 1]) = 2$
- $[1, 2] : f([1, 2]) = 0$
- $[2, 1] : f([2, 1]) = 0$
- $[2, 2] : f([2, 2]) = 2$

So the sum is $2 + 0 + 0 + 2 = 4$.

Example 2

Input

3 3

Output

27

Explanation

There are 27 possible conveyor belts, 9 of which have $f(a) = 3$ and the rest have $f(a) = 0$.

Example 3

Input

2026 2

Output

937223623

Example 4

Input

2026 3

Output

979361356

Note

- n represents both the number of flavours and the number of cookies on the conveyor belt.