

Sets

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 256 megabytes

Given numbers n and k .

Let $[n]$ be the set of all numbers from 1 to n .

A set A is a subset of B if for every $a \in A$, a also belongs to B . The empty set (\emptyset) is a subset of any set.

It is necessary to find the value of the function $f([n], k)$.

$f([n], 1)$ returns the number of subsets in the set $[n]$.

$f([n], k)$ where $k > 1$ returns the sum $f(s, k - 1)$ where s is a subset of $[n]$.

Input

The first line contains two integers ($1 \leq n, k \leq 10^9$).

Output

It is necessary to output $f([n], k)$. Since the answer may be too large, output it modulo $10^9 + 7$.

Scoring

In this problem, there are conditional blocks. If your solution works correctly for certain constraints, it will receive a certain number of points. Note that the evaluation is still in the testing phase.

1. (5 points): $k = 1$;
2. (5 points): $n \leq 10, k \leq 2$;
3. (10 points): $n \leq 15, k \leq 3$;
4. (80 points): without additional constraints.

Examples

| standard input | standard output |
|----------------|-----------------|
| 1 1 | 2 |
| 2 2 | 9 |
| 3 3 | 64 |

Note

In the first example, the set with 1 element ($\{1\}$) and $k = 1$, so $f(\{1\}, 1) = 2$ ($\{1\}$ and $\{\emptyset\}$).

In the second example, the set with 2 elements ($\{1, 2\}$) and $k = 2$. $f(\{1, 2\}, 2) = f(\{1, 2\}, 1) + f(\{1\}, 1) + f(\{2\}, 1) + f(\{\emptyset\}, 1) = 4 + 2 + 2 + 1 = 9$.