Algebra

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	1024 mebibytes

Construct a tree in the following classic way:

- Root the tree at vertex 1.
- For each vertex i from 2 to n, in order, select a vertex p from 1 to $i-1$ uniformly at random, and make p the parent of i.

Let the size of the subtree of vertex u be s_u, and $f_u = s_u^k$ (that is, the k-th power of s_u). For each vertex u, calculate the expected value of f_u, modulo a given prime number M.

Formally, it can be shown that, under the constraints below, each expected value can be represented as p/q where q is coprime with M. You have to output the integer value $p \cdot q^{-1} \bmod M$. Here, q^{-1} is an integer such that $q \cdot q^{-1} \bmod M = 1$.

Input

The first line of input contains three integers: n, k, and M ($1 \le n \le 10^5$; $1 \le k \le 200$; $10^8 \le M \le 10^9+7$).

It is guaranteed that M is a prime number.

Output

Output a line containing a single integer: the answer to the problem.

Examples

standard input	*standard output*
3 1 1000000007	3 500000005 1
3 2 998244353	9 499122179 1