

Problem B. Beautiful Sequence Unraveling

Input file: *standard input*
Output file: *standard output*
Time limit: 7 seconds
Memory limit: 512 mebibytes

You are a happy possessor of the powerful tool called *Beautiful Sequence Unraveler* (BSU). This tool works with beautiful sequences. A *beautiful sequence* is an array a_1, a_2, \dots, a_n of n integers for which the following statement holds: there are no integers i such that $1 \leq i < n$ and $\max\{a_1, \dots, a_i\} = \min\{a_{i+1}, \dots, a_n\}$.

BSU deals with beautiful sequences pretty well, but you do not know how frequently such sequences occur. So you want to calculate the number of beautiful sequences among all the arrays of length n which consist of integers between 1 and k , inclusively. Since this number may be large, you are required to calculate it modulo prime number p .

Input

The only line contains three integers n, k, p ($1 \leq n \leq 400$, $1 \leq k \leq 10^8$, $998\,244\,353 \leq p \leq 10^9 + 9$).

It is guaranteed that p is prime.

Output

Print the answer to the problem modulo p .

Examples

standard input	standard output
2 2 1000000007	2
3 4 1000000009	36
228 112263 998244353	379700769