Task 1. Pretty sequences

Today is the sequence day! The math teacher wrote some sequences on the whiteboard, each having ***N*** different numbers, all from 1 to ***N***, and told the students that these sequences had some special property. After some careful consideration, one of the students, **D**eni, guessed the correct property. All the sequences on the whiteboard had at least one pair of adjacent numbers in the form $(x, x+1)$. **D**eni was so happy that she called this type of sequence *pretty*. For example, for ***N*** = 4 the sequences: $3,1,2,4$ and $2,3,4,1$ are *pretty* but the sequences $2,4,1,3$ and $4,3,2,1$ aren't. After that, the math teacher gave **D**eni a harder question. She was asked to calculate the number of all possible *pretty* sequences with ***N*** different numbers, all from 1 to ***N***. This was so hard that **D**eni couldn't find an answer during the whole class. You are a friend of **D**eni and want to help her.

Task. Write the program **pretty**, which for a given ***N*** has to tell **D**eni the number of *pretty* sequences. This number can be rather large, so you have to calculate it modulo ***M***.

Input. From the first line of the standard input, read two integers ***N*** and ***M*** – the length of the sequences on the whiteboard and the module, used for the calculation.

Output. On one line of the standard output, the program has to write one integer – the number of *pretty* sequences with ***N*** different numbers, all from 1 to ***N***, modulo ***M***.

Constraints

- ♣ $1 \le N \le 10^{18}$
- ♣ $2 \le M \le 10^{7}$

Subtasks

Subtask	Points	*N*	Further constraints
1	0	–	The examples.
2	9	≤ 10	–
3	14	≤ 15	–
4	11	≤ 20	–
5	43	$\le 10^6$	–
6	23	$\le 10^{18}$	–

The points for a subtask are given only if all the tests for the subtask are successfully passed.

Examples

Input	Output	Explanation
4 42	13	*The pretty* sequences with 4 different numbers, all from 1 to 4, are: 1 2 3 4 3 1 2 4 1 2 4 3 3 4 1 2 1 3 4 2 3 4 2 1 1 4 2 3 4 1 2 3 2 1 3 4 4 2 3 1 2 3 1 4 4 3 1 2 2 3 4 1
2000 10009	1295	Here the real answer is a large number whose remainder modulo 10009 is 1295.