Doremy's Pegging Game

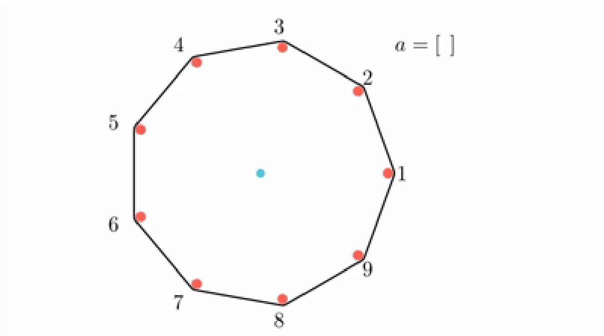
Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.5 seconds
Memory limit:	512 megabytes

Doremy has $n+1$ pegs. There are n red pegs arranged as vertices of a regular n-sided polygon, numbered from 1 to n in anti-clockwise order. There is also a blue peg of **slightly smaller diameter** in the middle of the polygon. A rubber band is stretched around the red pegs.

Doremy is very bored today and has decided to play a game. Initially, she has an empty array a. While the rubber band does not touch the blue peg, she will:

1. choose i $(1 \le i \le n)$ such that the red peg i has not been removed;
2. remove the red peg i;
3. append i to the back of a.

Doremy wonders how many possible different arrays a can be produced by the following process. Since the answer can be big, you are only required to output it modulo p. p is guaranteed to be a prime number.



game with $n = 9$ and $a = [7, 5, 2, 8, 3, 9, 4]$ and another game with $n = 8$ and $a = [3, 4, 7, 1, 8, 5, 2]$

Input

The first line contains two integers n and p $(3 \le n \le 5000,\ 10^8 \le p \le 10^9)$ — the number of red pegs and the modulo respectively.

p is guaranteed to be a prime number.

Output

Output a single integer, the number of different arrays a that can be produced by the process described above modulo p.

Examples

standard input	standard output
`4 100000007`	`16`
`1145 141919831`	`105242108`

Note

In the first test case, $n = 4$, some possible arrays a that can be produced are $[4, 2, 3]$ and $[1, 4]$. However, it is not possible for a to be $[1]$ or $[1, 4, 3]$.