Two Tokens

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	256 megabytes

Busy Beaver has given up on programming, and decides to take up modern art instead!

Busy Beaver has two tokens with paint on them. He would like to paint an undirected graph as follows:

- Initially, all vertices are unpainted. First, Busy Beaver places one token on vertex 1 and the other on vertex 2.
- Then, he slides tokens along the edges of the graph; whenever a vertex is covered by a token, that vertex becomes painted. (Note that vertices 1 and 2 start out painted.)
- If it is possible to paint all vertices such that the two tokens are **never** connected by an edge at any point during the process, the graph is called *artistic*.

Find the number of artistic undirected graphs on N vertices. Since the answer may be large, output it modulo a prime P.

Input

The only line of each test contains two integers N and P ($2 \le N \le 5000$; $5 \cdot 10^8 < P < 10^9$). P is prime.

Output

Output the number of artistic undirected graphs on N vertices, modulo P.

Examples

standard input	standard output
2 799999999	1
3 998244853	2
1984 998244853	424428556

Note

In the first test case, the graph with two vertices and no edges is the only artistic graph.

In the second test case, the first two graphs below are artistic. The last graph is not artistic, because it is impossible to ever paint the vertex 3.