

Problem Cntcrit

Input file `stdin`
Output file `stdout`

You are given an integer N . Consider all the labeled undirected graphs with N vertices. For each such graph, count the number of critical edges in it. Find the sum of the number of critical edges for all undirected graphs with N vertices.

An edge (u, v) is critical if by removing it, the number of connected components increases.

Since this number can be very large, print it modulo M , where M is a prime number.

Input data

The first line of the input will contain the numbers N and M .

Output data

Print a single integer, the sum of the number of critical edges for all undirected graphs with N vertices.

Restrictions

- $1 \leq N \leq 5\,000$.
- $2 \leq M \leq 10^9 + 9$, M is prime.

#	Points	Restrictions
1	11	$1 \leq N \leq 6$
2	53	$1 \leq N \leq 150$
3	36	No further restrictions.

Examples

Input file	Output file
6 2017	1254
319 666013	385993