

Count the Christmas Trees

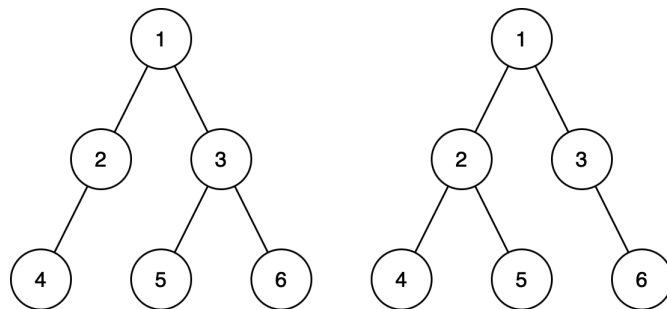
Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 512 megabytes

The New Year is coming soon! To celebrate, Matvey decided to buy himself a Christmas tree. He went to a store where graph-trees are sold. However, when he arrived, he couldn't decide because there was a huge selection. Then he decided to count how many Christmas trees of height n exist.

Matvey considers a tree with a root at vertex 1 to be a *Christmas tree of height n* if it satisfies the following conditions:

- let's assume that the root is on the first layer, its children are on the second layer, and so on, the children of the vertex on the i -th layer are on the $(i + 1)$ -th layer. Then there must be exactly i vertices on the i -th layer;
- each vertex has no more than two children;
- number the vertices by layers from top to bottom with integers, starting with 1. On one layer, number the vertices from left to right. After that, consider two vertices u, v , such that they are on the same layer and $u < v$, then all children of vertex u , if any, must have a smaller number than the children of vertex v .

Matvey considers Christmas trees to be different if there are numbers i, j , such that one tree has an edge between vertices i and j , and the other tree does not have such an edge.



For height 3, there are two different Christmas trees, which are shown in the figure.

You need to calculate the number of different Christmas trees of height n .

Input

The first line contains one number n — the depth of the Christmas tree ($1 \leq n \leq 5000$).

Output

In a single line, output one number — the number of Christmas trees of depth n .

Since the answer can be very large, output it modulo $10^9 + 7$.

Examples

standard input	standard output
3	2
4	12