

# SKYLINE - Skyline

The director of a new movie needs to create a scaled set for the movie. In the set there will be  $N$  skyscrapers, with distinct integer heights from 1 to  $N$  meters. The skyline will be determined by the sequence of the heights of the skyscrapers from left to right. It will be a permutation of the integers from 1 to  $N$ .

The director is extremely meticulous, so she wants to avoid a certain sloping pattern. She doesn't want for there to be ANY three buildings in positions  $i, j$  and  $k$ ,  $i < j < k$ , where the height of building  $i$  is smaller than that of building  $j$ , and building  $j$ 's height is smaller than building  $k$ 's height.

Your task is to tell the director, for a given number of buildings, how many distinct orderings for the skyline avoid the sloping pattern she doesn't like.

## Input

There will be several test cases in the input. Each test case will consist of a single line containing a single integer  $N$  ( $3 \leq N \leq 1,000$ ), which represents the number of skyscrapers. The heights of the skyscrapers are assumed to be 1, 2, 3, ...,  $N$ . The input will end with a line with a single 0.

## Output

For each test case, output a single integer, representing the number of good skylines - those avoid the sloping pattern that the director dislikes - modulo 1,000,000. Print each integer on its own line with no spaces. Do not print any blank lines between answers.

## Example

**Input:**

3  
4  
0

**Output:**

5  
14