Problem A

In how many different ways can we place black and white stones on $n \times n$ grid? You can place any number of each kind of stones, but each field can contain at most one stone. Two ways of placing the stones are considered to be the same if they can be transformed to one another by rotating the grid and/or by exchanging the colors of black and white stones. Note the possibility to mirror the grid is not included!

Input and output

Each line of the input contains a single integer n ($1 \leq n \leq 1\,000$). For each of them, output the number of placements as described above, modulo $1\,000\,003$.

Example

Input:

```
1
2
```

Output:

```
2
14
```