Counting

Mr. H believes that all CS3233 students are good at counting. He also believes that all the students can answer this classic problem fast. Here is the classic problem: Given a rectangle of size 2 x **N** with all cells colored white, determine the number of ways to paint all the cells with black color. It is obvious that the answer is (2**N**)!, that is the permutation of all the cells. Now, Mr. H challenges all CS3233 students with a harder problem.

1. The first cell that you can paint can be any of the 2**N** cells.
2. After that, each subsequent cell you paint must be adjacent to some black cell (that was already painted). Two cells are assumed to be adjacent if they are next to each other diagonally, vertically, or horizontally.

Mr. H needs the number of ways to paint all the cells with black color given **N**.

Input

There are multiple test cases. For each test case, you are only given 1 integer **N** ($1 \leq \mathbf{N} \leq 1{,}000$), as described above. The input is terminated when **N** is 0.

Output

For each test case, output the number of ways to paint all the cells with black color. The number can become very big, so print out the number modulo 1,000,000,007.

Sample Input

```
1
2
3
0
```

Sample Output

```
2
24
480
```