

# Upper Right King (Hard)

There is a king in the lower left corner of the  $n \times n$  chess board. The king can move one step right, one step up or one step up-right. How many ways are there for him to reach the upper right corner of the board?

## Input

The first line of input contains number  $T$  - the amount of test cases. Next  $T$  lines consist of single integer  $n$  - the size of the board.

## Constraints

$1 \leq T \leq 10000$

$1 \leq n \leq 1000000$

## Output

For each test case output the number of ways to reach upper right corner of  $n \times n$  board modulo 1000003.

## Example

**Input:**

2  
2  
3

**Output:**

3  
13