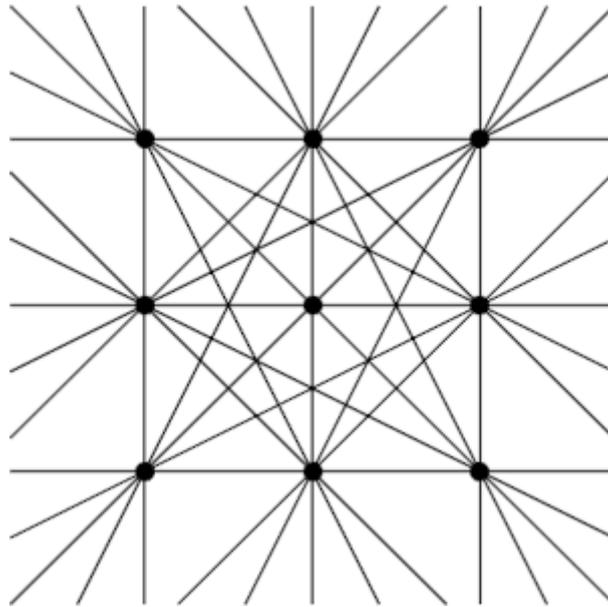


## G – Lines in a grid

*Time limit: 8 s    Memory limit: 1024 MiB*

Suppose that we are given a  $n \times n$  integer grid, e.g.  $\{(i, j)\}_{i=0, j=0}^{n-1, n-1}$ . Let  $l_n$  be the number of different lines that intersect with at least two points on the grid.

For  $n = 3$ , there are exactly 20 such lines, as drawn on the image below.



Compute  $l_n$  for all given  $n$ .

### Input data

First line contains an integer  $Q$  – the number of queries. The second line contains  $Q$  space-separated integers  $n_1, \dots, n_Q$ .

### Input limits

- $1 \leq Q \leq 1000$
- $1 \leq n_i \leq 10^7$

### Output data

Print  $Q$  numbers  $l_{n_1}, \dots, l_{n_N}$ , each in its own line. Since  $l_k$  can be large, print them modulo  $10^6 + 3$ .

**Example****Input**

3  
1 3 2

**Output**

0  
20  
6