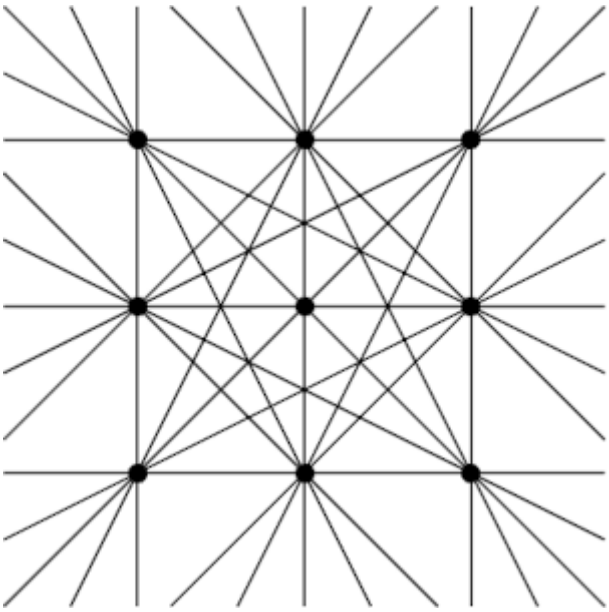
G – Lines in a grid

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 $n_1, \ldots, n_Q$.

Input limits

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

Output data

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

Example

Input	Output
3 1 3 2	0 20 6