D Disgruntled Judge

Once upon a time, there was an NWERC judge with a tendency to create slightly too hard problems. As a result, his problems were never solved. As you can image, this made our judge somewhat frustrated. This year, this frustration has culminated, and he has decided that rather than spending a lot of time constructing a well-crafted problem, he will simply write some insanely hard problem statement and just generate some random input and output files. After all, why bother having proper test data if nobody is going to try the problem anyway?

Thus, the judge generates a testcase by simply letting the input be a random number, and letting the output be another random number. Formally, to generate the data set with T test cases, the judge generates $2T$ random numbers $x_1, \ldots, x_{2T}$ between 0 and $10\,000$, and then writes T, followed by the sequence $x_1, x_3, x_5, \ldots, x_{2T-1}$ to the input file, and the sequence $x_2, x_4, x_6, \ldots, x_{2T}$ to the output file.

The random number generator the judge uses is quite simple. He picks three numbers x_1, a, and b between 0 and $10\,000$ (inclusive), and then for i from 2 to $2T$ lets

$$x_i = (a \cdot x_{i-1} + b) \bmod 10\,001.$$

You may have thought that such a poorly designed problem would not be used in a contest of such high standards as NWERC. Well, you were wrong.

Input

On the first line one positive number: the number of testcases, at most 100. After that per testcase:

- One line containing an integer n ($0 \leq n \leq 10\,000$): an input testcase.

The input file is guaranteed to be generated by the process described above.

Output

Per testcase:

- One line with an integer giving the answer for the testcase.

If there is more than one output file consistent with the input file, any one of these is acceptable.

Sample in- and output

Input	Output
3 17 822 3014	9727 1918 4110

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