C. Distinct Xor Subsequence Queries II

time limit per test: 1 second
memory limit per test: 256 megabytes

You are given an empty sequence a. Your task is to process q queries of the following types:

1. Append x to the end of sequence a;

2. Consider all 2^k possible subsequences of a, where k represents the current length of a. Among these subsequences, determine how many have a bitwise XOR value equal to x. Output the result modulo 998244353.

Input

The first line of input contains a single integer q $(1 \le q \le 2 \times 10^5)$.

Then, there are q lines describing the queries. Each line has two integers: $1\ x$ $(0 \le x < 2^{60})$ or $2\ x$ $(0 \le x < 2^{60})$

Output

For each query of type 2, print a line of a single integer denoting the answer.

Examples

input Copy

```
6
1 5
1 6
2 0
2 1
2 2
2 3
```

output Copy

```
1
0
0
1
```

input Copy

```
10
1 2024
1 2024
1 2024
1 2024
2 2024
1 1
1 1
1 1
1 1
2 2025
```

output Copy

```
8
64
```

Introductory Problems: XOR Basis

Finished

Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
325938058	Jun/25/2025 00:57	Accepted