B. Distinct Xor Subsequence Queries

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. Among all **distinct** numbers you can produce by choosing any subsequence(possibly empty) from a and calculating their bitwise XOR, print the k-th smallest one. If such a number does not exist, print -1 instead.

Input

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

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

Output

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

Examples

input Copy

```
7
1 5
1 6
2 1
2 2
2 3
2 4
2 5
```

output Copy

```
0
3
5
6
-1
```

input Copy

```
3
1 1000
1 1000
2 3
```

output Copy

```
-1
```

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
325937582	Jun/25/2025 00:46	Accepted
325935704	Jun/25/2025 00:07	Wrong answer on test 4