The 2009 ACM Asia Programming Contest Wuhan Site
sponsored by IBM
hosted by Wuhan University

Problem E
Exclusive-OR
Input: exclusive.in

You are **not** given n non-negative integers $X_0, X_1, ..., X_{n-1}$ less than 2^{20} , but they do exist, and their values never change.

I'll gradually provide you some facts about them, and ask you some questions.

There are two kinds of facts, plus one kind of question:

Format	Meaning
`I p v`	I tell you $X_p = v$
`I p q v`	I tell you X_p XOR $X_q = v$
`Q k p1 p2 … pk`	Please tell me the value of X_{p1} XOR X_{p2} XOR ... XOR X_{pk}

Input
There will be at most 10 test cases. Each case begins with two integers n and Q ($1 \le n \le 20,000$, $2 \le Q \le 40,000$). Each of the following lines contains either a fact or a question, formatted as stated above. The k parameter in the questions will be a positive integer not greater than 15, and the v parameter in the facts will be a non-negative integer less than 2^{20}. The last case is followed by $n=Q=0$, which should not be processed.

Output
For each test case, print the case number on its own line, then the answers, one on each one. If you can't deduce the answer for a particular question, from the facts I provide you **before** that question, print "`I don't know.`", without quotes. If the i-th fact (don't count questions) **cannot** be consistent with **all** the facts before that, print "`The first i facts are conflicting.`", then keep silence for everything after that (including facts and questions). Print a blank line after the output of each test case.

Sample Input

```
2 6
I 0 1 3
Q 1 0
Q 2 1 0
I 0 2
Q 1 1
Q 1 0
3 3
I 0 1 6
I 0 2 2
Q 2 1 2
2 4
I 0 1 7
Q 2 0 1
I 0 1 8
Q 2 0 1
0 0
```

Output for the Sample Input

```
Case 1:
I don't know.
3
1
2

Case 2:
4

Case 3:
7
The first 2 facts are conflicting.
```