

Nailoong vs. Bombloong 1

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 512 megabytes

This is a communication problem. In this problem, your program will be run twice. Between the two runs, all variables stored in memory will be lost, but the information obtained in the first run may be crucial for correctly solving the problem in the second run.

There are two characters in this problem: “Nailoong” and “Bombloong”. Meanwhile, there is a jury (also known as the interactor) who will test the tacit understanding between the two cute creatures.

Hence, they have to follow the strange rules as follows:

- Initially, the jury has an array a_1, \dots, a_{2^k} of length 2^k , where $0 \leq a_i \leq 1$ holds. A secret integer $1 \leq x \leq 2^k$ is also hidden by the jury.
- Both the initial array a and the secret integer x are told to Nailoong.
- Nailoong must respond to the jury with **exactly one** integer $1 \leq y \leq 2^k$, meaning to change a_y into $1 - a_y$.
- Then, the judge tells Bombloong with only the array a **after Nailoong’s modification**.
- Bombloong needs to recover the hidden integer x . Note that it does not necessarily need to know the value of y .

Communication Protocol

In each test case, the contestant’s program will be run twice. A testing tool is provided to help you develop and test your solution.

First Run

In the first run, you will play the role of “Nailoong”.

Input

The first line contains an integer 1, which allows your program to identify that this is the first run.

The second line contains two integers k, x ($0 \leq k \leq 16$, $1 \leq x \leq 2^k$).

The third line contains 2^k integers a_1, \dots, a_{2^k} ($0 \leq a_i \leq 1$).

Output

Output exactly one integer y such that $1 \leq y \leq 2^k$.

Second Run

In the second run, you will play the role of “Bombloong”.

Input

The first line contains an integer 2, which allows your program to identify that this is the second run.

The second line contains an integer k ($0 \leq k \leq 16$).

The third line contains 2^k integers a_1, \dots, a_{2^k} ($0 \leq a_i \leq 1$), noting that this is the array a modified by Nailoong.

Output

Output exactly one integer x such that $1 \leq x \leq 2^k$.

Examples

| standard input | standard output |
|---------------------|-----------------|
| 1 2 3 1 0 0 1 | 1 |
| 2 2 0 0 0 1 | 3 |

Note

The two examples are meant to demonstrate two runs on the same test.

Nailoong modified index $y = 1$ in the array, so that a changes from $[1, 0, 0, 1]$ to $[0, 0, 0, 1]$.

Bombloong received the array $a = [0, 0, 0, 1]$. Since Nailoong and Bombloong were in perfect sync, he thought that $x = 3$ and output the correct answer.