A. XORinacci

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Cengiz recently learned Fibonacci numbers and now he is studying different algorithms to find them. After getting bored of reading them, he came with his own new type of numbers that he named *XORinacci* numbers. He defined them as follows:

- $f(0) = a$;
- $f(1) = b$;
- $f(n) = f(n-1) \oplus f(n-2)$ when $n > 1$, where $\oplus$ denotes the bitwise XOR operation.

You are given three integers a, b, and n, calculate $f(n)$.

You have to answer for T independent test cases.

Input

The input contains one or more independent test cases.

The first line of input contains a single integer T ($1 \le T \le 10^3$), the number of test cases.

Each of the T following lines contains three space-separated integers a, b, and n ($0 \le a, b, n \le 10^9$) respectively.

Output

For each test case, output $f(n)$.

Example

input Copy

```
3
3 4 2
4 5 0
325 265 1231232
```

output Copy

```
7
4
76
```

Note

In the first example, $f(2) = f(0) \oplus f(1) = 3 \oplus 4 = 7$.


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