

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 ($1 \leq T \leq 10^3$), the number of test cases.

Each of the T following lines contains three space-separated integers a , b , and n ($0 \leq a, b, n \leq 10^9$) 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, $f(2) = f(0) \oplus f(1) = 3 \oplus 4 = 7$.

Manthan, Codefest 19 (open for everyone, rated, Div. 1 + Div. 2)

Finished

→ **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

→ **Problem tags**

math *900

No tag edit access

→ **Contest materials**

- Announcement (en) 
- Tutorial (en) 