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PROBLEMS SUBMIT STATUS STANDINGS CUSTOM TEST

C. Bitwise Balancing

time limit per test: 2 seconds
memory limit per test: 256 megabytes

You are given three non-negative integers b, c, and d.

Please find a non-negative integer $a \in [0, 2^{61}]$ such that $(a \mid b) - (a \,\&\, c) = d$, where $\mid$ and $\&$ denote the bitwise OR operation and the bitwise AND operation, respectively.

If such an a exists, print its value. If there is no solution, print a single integer -1. If there are multiple solutions, print any of them.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^5$). The description of the test cases follows.

The only line of each test case contains three positive integers b, c, and d ($0 \le b, c, d \le 10^{18}$).

Output

For each test case, output the value of a, or -1 if there is no solution. Please note that a must be non-negative and cannot exceed 2^{61}.

Example

input

```
3
2 2 2
4 2 6
10 2 14
```

output

```
0
-1
12
```

Note

In the first test case, $(0 \mid 2) - (0 \,\&\, 2) = 2 - 0 = 2$. So, $a = 0$ is a correct answer.

In the second test case, no value of a satisfies the equation.

In the third test case, $(12 \mid 10) - (12 \,\&\, 2) = 14 - 0 = 14$. So, $a = 12$ is a correct answer.

Codeforces Round 976 (Div. 2) and Divide By Zero 9.0

Finished

Practice

→ Virtual participation

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Start virtual contest

→ Clone Contest to Mashup

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Clone Contest

→ Submit?

Language: GNU G++17 7.3.0

Choose file: Choose File No file chosen

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→ Contest materials

- Announcement (en)
- Tutorial (en)

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