

# Dreamoon's Collection

## Description

As a math lover, Dreamoon has a collection of magic integers, called  $A$ .

One day, his lovely little sister found a magic number  $x$ , and want to send it as a gift to her brother.

But she thought it is too boring to send it directly, so she did a bitwise exclusive or for each  $a \in A$  by  $x$ , obtain a new collection  $B = \{a \oplus x \mid a \in A\}$ , then send it as a puzzle.

Can you help Dreamoon to solve this puzzle?

## Input

Each test case starts with a line containing an integer  $n$  indicating the size for both collections. Following this are 2 lines, each containing  $n$  integers, indicating the collections  $A, B$  from Dreamoon and his sister respectively.

- $1 \leq n \leq 10000$
- $0 \leq a \leq 10^9, \forall a \in A$
- $0 \leq b \leq 10^9, \forall b \in B$
- $n^2 \bmod 4 = 1$

## Output

For each test case, output the magic number  $x$  in a single line.

If there is no  $x$  satisfies the condition, please output  $-1$ .

If there are more than one  $x$  satisfy the condition, please output the smallest  $x$ .

## Sample Input

```
3
1 2 3
3 2 1
1
514
50730
5
1 2 3 5 8
13 21 34 55 89
```

## Sample Output

```
0
50216
-1
```