CPC '21 Contest 1 P2 - AQT and Multiset

Time limit: 2.0s **Memory limit:** 256M

AQT has two multisets of integers A and B, both of size $2N+1$ for some non-negative integer N. Help AQT determine the smallest non-negative integer c such that after XOR-ing each element in A by c, the multisets A and B are equal.

Constraints

In all subtasks,

$0 \leq A_i, B_i < 2^{63}$

$0 \leq N \leq 2 \cdot 10^5$

Subtask 1 [5%]

$0 \leq A_i, B_i < 2^{15}$

$0 \leq N \leq 100$

Subtask 2 [15%]

$0 \leq N \leq 10^3$

Subtask 3 [80%]

No additional constraints.

Input Specification

The first line contains one integer N.

The second line contains $2N+1$ space separated integers, $A_1, \ldots, A_{2N+1}$.

The third line contains $2N+1$ space separated integers, $B_1, \ldots, B_{2N+1}$.

Output Specification

Output the smallest possible value of c as described above on a single line. If no such value exists, output `-1` on a single line.

Sample Input 1

```
3
84 80 88 84 93 84 86
5 1 12 7 9 5 5
```

Sample Output 1

```
81
```

Explanation of Sample Output 1

The smallest possible solution is $c = 81$. If we XOR each element in A by 81, we have $A = \{5, 1, 9, 5, 12, 5, 7\}$, which is equivalent to B.

Sample Input 2

```
1
3 1 9
1 12 123
```

Sample Output 2

```
-1
```