F. Anton and School

Anton goes to school, his favorite lessons are arraystudying. He usually solves all the tasks pretty fast, but this time the teacher gave him a complicated one: given two arrays b and c of length n, find array a, such that:

where a and b means bitwise AND, while a or b means bitwise OR.

Usually Anton is good in arraystudying, but this problem is too hard, so Anton asks you to help.

Input
The first line of the input contains a single integers n ($1 \leq n \leq 200\,000$) — the size of arrays b and c.

The second line contains n integers b_i ($0 \leq b_i \leq 10^9$) — elements of the array b.

Third line contains n integers c_i ($0 \leq c_i \leq 10^9$) — elements of the array c.

Output
If there is no solution, print -1.

Otherwise, the only line of the output should contain n non-negative integers a_i — elements of the array a. If there are multiple possible solutions, you may print any of them.

Examples

input
4 6 8 4 4 16 22 10 10

output
3 5 1 1

input
5 8 25 14 7 16 19 6 9 4 25

output
-1