

Strange Operation (strangeoperation)

Doctor Strange found two integer arrays of length N , namely A_0, \dots, A_{N-1} and B_0, \dots, B_{N-1} . He can perform the following operation on A any number of times:

- Choose an index $1 \leq i \leq N - 2$ and let $A_i := -(A_{i-1} + A_i + A_{i+1})$. That is, assign the value $-(A_{i-1} + A_i + A_{i+1})$ to A_i .



Figure 1: Dr. Strange is preparing to perform some operations.

Help the Doctor determine whether it is possible to make the array A equal to B and if so, then find the minimum number of operations required to achieve this.

📎 Among the attachments of this task you may find a template file `strangeoperation.*` with a sample incomplete implementation.

Input

The first line contains the only integer N . The second line contains N integers, the elements of array A . The third line contains N integers, the elements of array B .

Output

You need to write a single line with an integer: the minimum number of operations required to make A equal to B , or -1 if it is not possible to do so.

Constraints

- $2 \leq N \leq 200\,000$.
- $-10^9 \leq A_i, B_i \leq 10^9$ for each $i = 0 \dots N - 1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

In this task, you can get **partial scores**: you will get 50% of the points for a subtask if you successfully determine whether it is possible to make A equal to B (but do not correctly solve all of its test cases). For this, the following condition must be satisfied for all test cases in a subtask: you should output -1 whenever it is impossible to make the two arrays equal, and otherwise, you should output a non-negative integer between 0 and $2^{63} - 1$.

- Subtask 1 (0 points)

Examples.

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- Subtask 2 (15 points)

There is at most one non-zero number in A .

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- Subtask 3 (18 points)

$N \leq 7$.

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- Subtask 4 (50 points)

$N \leq 1000$.

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- Subtask 5 (17 points)

No additional limitations.

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Examples

| input | output |
|-------------------------------------|--------|
| 6 2 7 1 8 2 8 2 -10 1 -11 1 8 | 3 |
| 4 3 1 4 1 -4 1 -6 1 | -1 |

Explanation

In the **first sample case**, consider the following steps for the array $A = [2, 7, 1, 8, 2, 8]$:

- Perform the operation on index 3. The array becomes: $[2, 7, 1, -11, 2, 8]$.
- Perform the operation on index 1. The array becomes: $[2, -10, 1, -11, 2, 8]$.
- Perform the operation on index 4. The array becomes: $[2, -10, 1, -11, 1, 8]$.

It is not possible to make the two arrays equal in less than 3 moves.

In the **second sample case**, it can be proven that there is no way to make A equal to B using the described operation.