A. Biye!!!

Congratulations! After years of struggle, you are finally getting married. The venue is set, the guests have arrived, and the aroma of Kacchi Biryani fills the air. However, a crisis has emerged that threatens the prestige (”Loke ki bolbe”) of your family.

You are serving dinner to N VIP guests seated in a single row at the Head Table. Currently, the size of the mutton piece on the i-th guest’s plate is denoted by A_i.

Unfortunately, your Father-in-Law has invited the dreaded Judgmental Auntie Squad. These Aunties do not look at plates individually; they scan the table in pairs to find flaws. For any two adjacent guests at indices i and i + 1, the Aunties will strictly judge that section based on the largest piece of meat between them. The smaller piece is ignored, but the larger piece sets the ”status” for that pair.

Your Father-in-Law has provided a ”Vision of Perfection” represented by an array B. To avoid a scandal, the Aunties’ judgment of your table must perfectly match their judgment of the Father-in-Law’s vision.

Formally, for every adjacent pair of guests $(1 \leq i < N)$, the following condition must hold:

$$max(A'_i, A'_{i+1}) = max(B_i, B_{i+1})$$

Where A' is the modified state of your array A.

You are currently hiding under the table with a toolkit. In one operation, you can:

- Increment the size of the mutton piece on a specific plate by 1 (using edible glue).
- Decrement the size of the mutton piece on a specific plate by 1 (using a knife).

Your task is to determine the minimum total number of operations required to satisfy the Aunties and save your marriage.

Input

The first line contains a single integer $N(2 \leq N \leq 2 \times 10^5)$, the number of guests.

The second line contains N space-separated integers $A_1, A_2, ..., A_N(1 \leq A_i \leq 10^9)$, the initial sizes of the mutton pieces.

The third line contains N space-separated integers $B_1, B_2, ..., B_N (1 \leq B_i \leq 10^9)$, the reference sizes from the Father-in-Law's vision.

Output

Print a single integer representing the minimum number of operations required to satisfy the condition.

Examples

Input	Output
3 2 5 2 2 3 2	2

- Current Table (A): [2, 5, 2]. The Aunties see maximums of max(2, 5) = 5 and max(5, 2) = 5.
- Vision (B): [2, 3, 2]. The Aunties expect maximums of max(2, 3) = 3 and max(3, 2) = 3.
- The Fix: You act quickly to trim the middle piece (A2) from 5 down to 3.
- Result: New A′ = [2, 3, 2]. The pair maximums are now 3 and 3. The Aunties are satisfied.
- Total cost = 2 operations

Input	Output
4 4 4 4 4 1 2 3 4	5