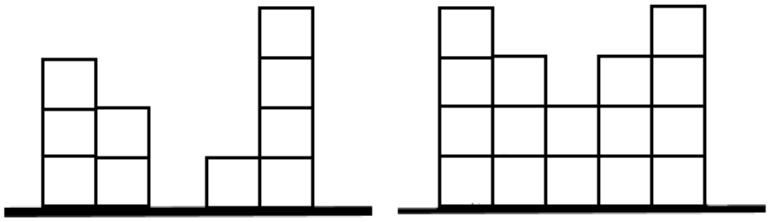
Mirko and Slavko are playing with bricks. Both of them have their own pile of bricks. The piles consist of **N** columns (where **N** is an odd number). The number of bricks in the **i**th column of Mirko's pile is labeled with $\mathbf{m}_i$ and Slavko's pile with $\mathbf{s}_i$.

They have decided to create two **equal** piles constructed in a way that the heights of columns are **strictly descending** at first and then **strictly ascending** (see right image below) and the heights of adjacent columns differ **exactly** by 1 (see image). The lowest of the columns must have an **equal** number of columns to the left and to the right of it.

The piles can be modified by removing **one** brick from **the top of some column** and throw it out the window (they **cannot reuse** it) or by taking **one** brick from the box and place it on **the top of some column** (there is an infinite amount of bricks in the box). Removing or placing a brick counts as one move.

You have to determine the **minimal** number of moves so that Mirko and Slavko can rearrange their piles in the described way.



On the left, there is a pile with column heights 3, 2, 0, 1 and 4.
On the right, there is one of the possible final layouts.

INPUT

The first line of input contains an **odd** number **N**. ($1 \leq \mathbf{N} \leq 300\,000$), the number of columns in both piles.

The second line of input contains **N** integers $\mathbf{m}_i$ ($0 \leq \mathbf{m}_i \leq 10^{12}$), column heights in Mirko's pile.

The third line of input contains **N** integers $\mathbf{s}_i$ ($0 \leq \mathbf{s}_i \leq 10^{12}$), column heights in Slavko's pile.

OUTPUT

The first and only line of output must contain the minimal number of moves.

SCORING

In test cases worth 40% of total points, the following will hold: $1 \leq \mathbf{N} \leq 1\,000$ i $0 \leq \mathbf{m}_i, \mathbf{s}_i \leq 1\,000$.

SAMPLE TESTS

input	input
3 1 2 3 3 2 2	5 2 3 0 1 4 3 3 2 3 1
output	**output**
3	10

Clarification of the first example: Mirko places two bricks on the top the first column in his pile and Slavko places one brick on the top of the third column in his pile.