Problem I. Absolute Game

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Alice and Bob are playing a game. Alice has an array a of n integers, Bob has an array b of n integers. In each turn, a player removes one element of his array. Players take turns alternately. Alice goes first.

The game ends when both arrays contain exactly one element. Let x be the last element in Alice's array and y be the last element in Bob's array. Alice wants to maximize the absolute difference between x and y while Bob wants to minimize this value. Both players are playing optimally.

Find what will be the final value of the game.

Input

The first line contains a single integer n ($1 \le n \le 1\,000$) — the number of values in each array.

The second line contains n space-separated integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^9$) — the numbers in Alice's array.

The third line contains n space-separated integers $b_1, b_2, \ldots, b_n$ ($1 \le b_i \le 10^9$) — the numbers in Bob's array.

Output

Print the absolute difference between x and y if both players are playing optimally.

Examples

standard input	standard output
4 2 14 7 14 5 10 9 22	4
1 14 42	28

Note

In the first example, the $x = 14$ and $y = 10$. Therefore, the difference between these two values is 4.

In the second example, the size of the arrays is already 1. Therefore, $x = 14$ and $y = 42$.