Exercise

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

In a classroom, there are $2n$ students. The i-th student has skill c_i. A teacher is holding an exercise that requires working in pairs. Initially, students $2i - 1$ and $2i$ are paired, for each i from 1 to n.

Now, the teacher wants to form new pairs $(a_1, b_1), (a_2, b_2), \ldots, (a_n, b_n)$ with the following conditions:

- Each student is in exactly one pair. That is, each number from 1 to $2n$ appears among numbers $a_1, a_2, \ldots, a_n, b_1, b_2, \ldots, b_n$ exactly once.
- No two students that were in a pair before will be in a pair again. That is, there are no $1 \le i, j \le n$ such that $a_i = 2j - 1, b_i = 2j$, or $a_i = 2j, b_i = 2j - 1$.

The teacher wants to minimize the sum of differences in skills over the n pairs, as this would be more productive. In other words, $|c_{a_1} - c_{b_1}| + |c_{a_2} - c_{b_2}| + \ldots + |c_{a_n} - c_{b_n}|$ should be as small as possible.

What is the smallest value of $|c_{a_1} - c_{b_1}| + |c_{a_2} - c_{b_2}| + \ldots + |c_{a_n} - c_{b_n}|$ the teacher can achieve?

Input

The first line of the input contains a single integer n $(2 \le n \le 100\,000)$.

The second line of the input contains $2n$ integers $c_1, c_2, \ldots, c_{2n}$ $(0 \le c_i \le 10^9)$ — the skills of the students.

Output

Output a single integer — the smallest possible value of $|c_{a_1} - c_{b_1}| + |c_{a_2} - c_{b_2}| + \ldots + |c_{a_n} - c_{b_n}|$ that the teacher can achieve.

Examples

standard input	standard output
2 1 2 3 4	4
3 1 9 3 4 2 6	7

Note

In the first example, the teacher can pair up the first student with the third and the second student with the fourth, getting $|3 - 1| + |4 - 2| = 4$.

In the second example, the teacher can pair up the first student with the third, the second with the sixth, and the fourth with the fifth, getting $|1 - 3| + |9 - 6| + |4 - 2| = 7$.