

Sophie's World of Balance

Problem ID: sophieworld

Sophie recently became interested in philosophy and learned about idealism and utilitarianism. As an adventurous young philosopher, she decided to mix those two and build her own realm of philosophy. She came up with the following problem:

In her world of ideas, there are a total of $2n + 6$ ideas. Each idea is associated with a utility value. Sophie shall pair each idea with another idea, and the imbalance caused by such a pair would be the difference between their utility values.

However, Sophie does not think her world should be binary, so she decided to create exactly two idea triples (with three ideas each). The imbalance caused by such a triple would be the difference between the largest utility value and the smallest utility value in the triple.

For instance, suppose that there are 8 ideas (so $n = 1$) with utility 1, 2, 3, 4, 5, 6, 7, 8. Consider these possible arrangements:

- groups: [5, 6, 7], [1, 2, 4], and [3, 8]. The total imbalance of this arrangement is $(7 - 5) + (4 - 1) + (8 - 3) = 10$.
- groups: [1, 2, 3], [6, 7, 8], and [4, 5]. The total imbalance of this arrangement is $(3 - 1) + (8 - 6) + (5 - 4) = 5$.

Sophie wants to make sure the world is as balanced as possible, so the second arrangement is better. And it turns out that it is also the best in this case!

Can you help Sophie solve the problem for her emerging philosophy?

Input

The first line of input contains a single integer n ($1 \leq n \leq 10^5$). The second line contains $2n + 6$ integers separated by spaces representing the utility of ideas. Each number is between 1 and 10^9 .

Output

The output should contain a single line with a single integer: the smallest possible imbalance value for an arrangement of these ideas into two triples and n pairs.

Sample Input 1

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1
1 2 3 4 5 6 7 8
```

Sample Output 1

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5
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Sample Input 2

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2
1 1 1 1 1 1 1 1 1 1
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Sample Output 2

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0
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Sample Input 3

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2
10 1 3 5 25 2 3 1 42 10
```

Sample Output 3

```
20
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