UHCC1 P4 - Manhattan Distance

Time limit: 1.0s **Memory limit:** 256M

Felim has N points with integer coordinates in the xy-plane that he received as a Valentine's gift, and he wants to find two distinct points A and B with integer coordinates such that the sum of the Manhattan distance between the N points and A and B is minimal.

He is unable to do so, so he wants you to find these two points and output the minimum distance.

The Manhattan distance between (x_1, y_1) and (x_2, y_2) is $|x_1 - x_2| + |y_1 - y_2|$.

Constraints

$1 \leq N \leq 10^6$

$-10^9 \leq x_i, y_i \leq 10^9$

Input Specification

The first line contains the integer N. The next N lines each contain 2 integers, x_i, y_i.

Output Specification

The first and only line contains the minimum sum of the Manhattan distance from the N points to the two points you selected.

Sample Input

```
4
3 1
5 1
1 3
5 4
```

Sample Output

```
22
```

Explanation for Sample

If we choose the two points to be $(3, 3)$ and $(4, 2)$, then the sum of distances is $11 + 11 = 22$. It can be proven that this is minimal.