Problem I. 1%-Euclidean

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Given n points $p_1, p_2, \ldots p_n$ in the two-dimensional Euclidean plane, calculate the total pairwise Euclidean distance between them. Simple as that.

Recall that Euclidean distance between two points $a = (x_1, y_1)$ and $b = (x_2, y_2)$ is defined as follows:

$$\text{dist}(a, b) = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Input

The first line of input contains a single integer n ($1 \le n \le 500\,000$), the number of points.

The i-th of the following n lines contains a pair of integers x_i, y_i ($-10^6 \le x_i, y_i \le 10^6$), the coordinates of p_i.

Output

Output the value of $\sum_{i<j} \text{dist}(p_i, p_j)$. Your answer will be considered correct if its relative or absolute error does not exceed 10^{-2}.

Examples

standard input	standard output
3 -1 2 2 2 -1 -2	12.0000000000
4 0 0 2 0 0 2 2 2	13.6568542490

Note

In the first sample test the pairwise distances are 3, 4 and 5.

In the second sample test the pairwise distances are $2, 2, 2, 2, 2\sqrt{2}, 2\sqrt{2}$.