E. Points

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given N points on a plane. Write a program which will find the sum of squares of distances between all pairs of points.

Input

The first line of input contains one integer number N ($1 \le N \le 100\,000$) — the number of points. Each of the following N lines contain two integer numbers X and Y ($-10\,000 \le X, Y \le 10\,000$) — the coordinates of points. Two or more points may coincide.

Output

The only line of output should contain the required sum of squares of distances between all pairs of points.

Examples

input	Copy
4 1 1 -1 -1 1 -1 -1 1	

output
32