

Sum of Vectors

[English](#)

[Vietnamese](#)

We can represent a 2D vector as a pair (X, Y) . The sum of two or more vectors is a vector whose coordinates are the sums of the corresponding coordinates of all the vectors in the sum. e.g. $(1, 2) + (3, 4) + (5, 6) = (1 + 3 + 5, 2 + 4 + 6) = (9, 12)$ Weight of a vector (x, y) is defined as $x * x + y * y$. You are given N vectors on a plain.

Your task is to write a program that will determine a subset of those vectors so the weight of the sum of all vectors in that subset is maximal.

Note: Use 64-bit integers (int64 in pascal or long long in c)

Input

In the first line of the input file is an integer N , $1 \leq N \leq 30,000$, the number of vectors.

The following N lines contain descriptions for each of the vectors. A description is made of two integers X and Y , separated by a single blank, $-30,000 \leq X, Y \leq 30,000$.

None of the given vectors will be $(0, 0)$

Output

In the first and only line of the output file you have to write the weight of the maximum sum.

Sample

Input:

```
5
5 -8
-4 2
4 -2
2 1
-6 4
```

Output:

```
202
```

Input:

```
4
1 4
-1 -1
1 -1
-1 4
```

Output:

```
64
```

Input:

```
9
0 1
6 8
```

0 -1
0 6
-1 1
-1 2
5 -4
1 0
6 -5

Output:
360