

# 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