

Task: DWA

Two stones



XXV OI, Stage III, Day trial. Source file dwa.* Available memory: 128 MB.

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Two stones are located at the point $(0,0)$ of an infinite grid. There are exactly n possible moves, not necessarily unique, that each of the stones can independently make. A move is described by a vector of integer coordinates. Each stone can make each move at most once, and the moves it makes may be arranged in any order. Note that making a particular move by one stone does not prevent the other from making the same move at any time.

Our goal is to move the stones as far (in the Euclidean distance) apart as possible. How far is that?

Input

The first line of the standard input contains a single positive integer n that specifies the number of possible moves. Each of the n lines that follow contains two integers x_i, y_i ($-10^4 \leq x_i, y_i \leq 10^4$), separated by a single space, forming the vector $[x_i, y_i]$, which describes a possible move of a stone.

Output

Your program should print a single integer to the standard output, namely the square of the maximum possible distance between the stones.

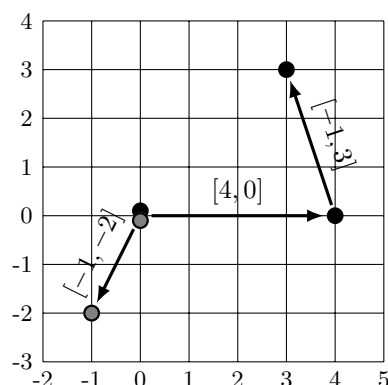
Przykład

For the following input data:

```
3
-1 3
-1 -2
4 0
```

the correct answer is:

```
41
```



Explanation for the example: The figure depicts an optimal solution: The first stone makes moves given by the vectors $[4,0]$ and $[-1,3]$, while the second stone makes a single move given by the vector $[-1,-2]$.

Sample grading tests:

1ocen: $n = 5$, the vectors are $[0,0]$, $[1,0]$, $[0,-1]$, $[-1,0]$, and $[0,1]$;

2ocen: $n = 100$, the vectors are $[i,j]$ for $i, j \in \{1, 2, \dots, 10\}$;

3ocen: $n = 200\,000$, all vectors are $[-1,-1]$.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several unit tests.

Subset	Property	Score
1	$n \leq 20$	15
2	$n \leq 2000$	45
3	$n \leq 200\,000$	40