

international collegiate programming contest ASIA REGIONAL CONTEST

**ICPC JAKARTA 2022** 



# Problem B Magical Barrier

There are *N* power sources, numbered from 1 to *N*, scattered around the ICPC Kingdom. Power source *i* is uniquely located at coordinate  $(X_i, Y_i)$  in a 2D Cartesian plane such that there are no three power sources located in a straight line.

For each pair of distinct power sources *i* and *j* that satisfies  $1 \le i < j \le N$ , a magical barrier forms as a line segment that spans from  $(X_i, Y_i)$  to  $(X_j, Y_j)$ .

You noticed a strange phenomenon. When two distinct magical barriers are intersecting, then both magical barriers are somewhat strengthened. To simplify things, you define the **strength** of a magical barrier *b* as the number of magical barriers other than *b* that intersects with *b*. Two distinct magical barriers are intersecting if and only if there exists exactly one point (x, y) that lies on both magical barriers while none of the *N* power sources are located at (x, y).

You want to find the strength of the strongest magical barrier in the ICPC Kingdom.

## Input

Input begins with an integer N ( $2 \le N \le 1000$ ) representing the number of power sources. Each of the next N lines contains 2 integers  $X_i Y_i$  ( $-10^9 \le X_i, Y_i \le 10^9$ ) representing the location of power source i. It is guaranteed that the location of each power source is unique, and there are no three power sources located in a straight line.

# Output

Output an integer in a single line representing the strength of the strongest magical barrier.

# Sample Input #1

6	
C	0
C	6
6	0
6	6
1	4
1	2

## Sample Output #1

#### 3

Explanation for the sample input/output #1

Let  $\langle i, j \rangle$  be the magical barrier that spans from power source *i* to power source *j*.





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One of the strongest magical barriers is  $\langle 1, 4 \rangle$  with a strength of 3. The 3 magical barriers that intersect with  $\langle 1, 4 \rangle$  are  $\langle 2, 3 \rangle$ ,  $\langle 3, 6 \rangle$ , and  $\langle 3, 5 \rangle$ . Note that the magical barrier  $\langle 2, 3 \rangle$  also has a strength of 3.

## Sample Input #2

2 0 0

0 1

## Sample Output #2

0

Explanation for the sample input/output #2

The only magical barrier is  $\langle 1, 2 \rangle$  with a strength of 0.

#### Sample Input #3

4	
-	3 0
3	0
0	3
0	1

#### Sample Output #3

0

Explanation for the sample input/output #3

All magical barriers have a strength of 0.

#### Sample Input #4

4	
С	0
С	1
1	0
1	1

#### Sample Output #4

1

Explanation for the sample input/output #4

The strongest magical barrier is either (1, 4) or (2, 3), which intersects each other at (0.5, 0.5).