

# TLE '17 Contest 8 P1 - Artificial Intelligence

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Fax McClad, Croneria's most disruptively innovative bounty hunter, plans to use artificial intelligence in order to track down the Dankey Kang Gang.

But, Fax doesn't know much about the artificial intelligence field, so he decides to hire somebody to do it for him. Luckily, you have been selected for an interview!

Advanced artificial intelligence algorithms require good understanding of linear algebra, so in your interview, Fax asks you some linear algebra questions.



*Artificial intelligence.*

We say that a function  $T$  defined on the real numbers is a **linear transformation** if  $T(x + y) = T(x) + T(y)$  and  $T(cx) = cT(x)$  for all real  $x, y, c$ .

Given  $N$  pairs in the form  $(x, T(x))$ , Fax wants you to tell him if  $T$  could be a linear transformation or not. You have failed several linear algebra exams before, and you definitely don't want to fail this interview. Can you answer Fax's question?

## Input Specification

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The first line of input will contain  $N$ , ( $1 \leq N \leq 100\,000$ ), the number of pairs.

$N$  lines of input follow. Each line will contain two integers, representing the pair  $(x, T(x))$ . The absolute value of these integers will not exceed  $10^6$ .

For 50% of the points,  $N \leq 1\,000$ .

## Output Specification

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Output  if  $T$  could be a linear transformation, otherwise, output  if it is definitely not.

## Sample Input 1

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2
1 2
2 4
```

## Sample Output 1

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yes

## Sample Input 2

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```
3
1 2
2 1
3 5
```

## Sample Output 2

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no