

Contest Duration: 2025-09-07(Sun) 14:10 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250907T1310&p1=248>) - 2025-09-07(Sun) 15:50 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250907T1450&p1=248>) (local time) (100 minutes)

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## E - Colinear

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 450 points

### Problem Statement

There are  $N$  points on a two-dimensional plane.  $N$  is odd. The  $i$ -th point is at  $(x_i, y_i)$ . All point coordinates are distinct.

Determine whether there exists a line passing through more than half of the  $N$  points, and if so, output it.

For any input satisfying the constraints, if a line satisfying the condition exists, it can be expressed as  $ax + by + c = 0$  using integers  $a, b, c$  with  $-10^{18} \leq a, b, c \leq 10^{18}$  (where  $(a, b, c) \neq (0, 0, 0)$ ). Output these  $a, b, c$ .

### Constraints

- $3 \leq N \leq 5 \times 10^5$
- $N$  is odd.
- $-10^8 \leq x_i \leq 10^8$
- $-10^8 \leq y_i \leq 10^8$
- If  $i \neq j$ , then  $(x_i, y_i) \neq (x_j, y_j)$ .
- All input values are integers.

## Input

The input is given from Standard Input in the following format:

```
N  
x1 y1  
x2 y2  
:  
xN yN
```

## Output

If no line satisfying the condition exists, output No.

If a line satisfying the condition exists, output two lines. On the first line, output Yes, and on the second line, output  $a, b, c$  in this order separated by spaces.  $a, b, c$  must satisfy  $-10^{18} \leq a, b, c \leq 10^{18}$  and  $(a, b, c) \neq (0, 0, 0)$ .

If there are multiple solutions, any of them will be considered correct.

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### Sample Input 1

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```
3  
1 1  
3 2  
2 4
```

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### Sample Output 1

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```
Yes  
2 1 -8
```

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The line  $2x + y - 8 = 0$  passes through the 2nd and 3rd points, so it satisfies the condition.

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### Sample Input 2

[Copy](#)

```
5  
5 2  
1 3  
2 6  
4 4  
5 4
```

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## Sample Output 2

Copy

No

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No line satisfying the condition exists.

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## Sample Input 3

Copy

```
11
-9374372 85232388
-60705467 86198234
-7475320 80628487
98066347 -23868213
-12177678 85284287
30535572 -35358356
51324557 22410787
28854279 44658587
-28804873 82911971
65052073 8819187
-67744430 68365758
```

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## Sample Output 3

Copy

Yes

4655800 4702358 -344340416016346

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'#telegram)

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