Optimal fly   P61365_en

A fly just travelled between two points in the plane, stopping at several windows (segments) on its way. The fly does not have a very big brain, but it is powerful enough to fly in a straight line between stops. Now the fly wants to go back and visit the windows in reverse order, but it is still worried about efficiency. Is the reverse path optimal? Please help the fly with your bigger brain.

Input

Input consists of several cases, which only have integer numbers. Every case begins with the number of segments n. Follow the description of the $s_1 \ldots s_n$ segments, in the order the fly visits them, each with two pairs (x, y) with the coordinates of its two endpoints. Follow $n + 2$ pairs (x, y) with the coordinates of the points a_i where the fly stopped at the segments, in order. The first pair is the initial position a_0, and the last pair is the final position a_{n+1}.

Assume $1 \leq n \leq 10^4$. Segments are different, and do not intersect. The polygonal line $a_{n+1} \ldots a_0$ does not cross any segment. For all $1 \leq i \leq n$, a_i is strictly inside the segment s_i. The length of each window and flight segment is strictly positive, and at most 1000. No coordinate is larger than 10^6 in absolute value.

Output

Print "yes" if the polygonal line $a_{n+1} \ldots a_0$ is the shortest path between a_{n+1} and a_0 that visits the segments $s_n \ldots s_1$ in this order. Print "no" otherwise.

Hint

All the required computations can be made with `long longs` without overflows.

Sample input 1

```
1
500 0   500 100
0 0
500 50
0 100

1
500 0   500 100
0 0
500 50
0 50
```

Sample output 1

```
yes
no
```

Problem information

Author: Marc Vinyals

Generation: 2026-01-25T11:08:53.430Z