

Day 1 - Problem 1 - Watching over the lake

Five years ago the authorities noted that the number of the Ohrid trout in the lake is drastically low. They have decided to forbid the fishing in the lake for 10 years. But there are still lots of illegal fishermen. To catch them, the authorities want to put a 360 degree camera in a position in the lake so it can monitor the whole lake. The lake is a polygon, given by the coordinates of the vertices in the clockwise order. Your task is to find out is there a position in the lake that can be used to put the camera so that the whole lake will be visible from that point. It is possible to look along the coast (if the camera is in line with the coast, it monitors it), but it cannot monitor over the coast line.

Input

The first line contains single integer $n \leq 3$, the number of test cases. Every test case starts with a number $4 \leq k \leq 100$, the number of vertices of the lake. In the following k lines there are two integers, x_i and y_i , both between -30000 and 30000 , the coordinates of the i^{th} vertex of the lake. The edge of the lake is a closed broken line with no self-intersections.

Output

For every test case the output is a single line containing YES – if there is a position for the camera and NO if it is not possible to find suitable place for the camera.

Grading will be done over two sets of inputs.

The first set of inputs (4 out of 10) will contain only test cases where the sides of the lake are either horizontal or vertical.

The second set (6 out of 10) will be without any restrictions considering the direction of the lines in the polygon.

Example

Input	Output
2	YES
4	NO
0 0	
0 1	
1 1	
1 0	
6	
0 0	
1 2	
1 1	
2 1	
2 2	
3 0	