Two rectangles

Given 8 integers: -1000 < x_1, y_1, x_2, y_2, x_3, y_3, x_4, y_4 < 1000.

Check what is the shape of the intersection of two axis-aligned rectangles: $P1$ = (x_1, y_1), (x_1, y_2), (x_2, y_2), (x_2, y_1) and $P2$ = (x_3, y_3), (x_3, y_4), (x_4, y_4), (x_4, y_3).

- If the rectangles do not intersect print nothing.
- If there is exactly one point in common print point.
- If the intersections of $P1$ and $P2$ is a line segment print line.
- If they have a rectangular area in common print rectangle.

Input data specification

The first line contains the number of test cases t (1<=t<1000). Each of the following t lines contains 8 integers: x_1, y_1, x_2, y_2, x_3, y_3, x_4, y_4.

The area of both rectangles is greater than 0.

Output data specification

For each test case print one word on a separate line: nothing, point, line or rectangle.

Example

Input:
5
1 1 2 2 2 2 3 3
10 1 1 10 12 9 10 12
2 3 10 10 1 4 0 0
1 20 20 1 2 10 10 2
10 20 20 10 20 30 25 1

Output:
point
line
nothing
rectangle
line

Scoring

By solving this problem you will score **10** points.

Bonus challenge

The registered contestant who solves the problem in the least number of bytes of source code will receive a small gift.