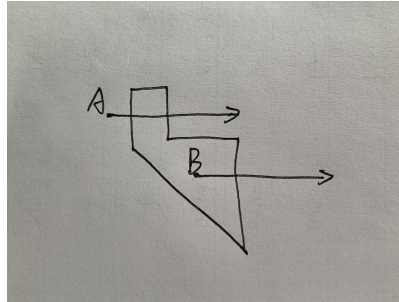


Question solution

In this question, I used the half-line method.

For a given point and polygon, the half-line to the right of the point may intersect the polygon for many times or not. If the number of intersections with the polygon is even, the point is outside the polygon, or if the number of intersections with the polygon is odd, the point is inside the polygon.

For example, in the photo below:



The half-line of point A intersects the polygon for 2 times and 2 is an even number, so point A is outside the polygon.

The half-line of point B intersects the polygon for 1 times and 1 is an odd number, so point B is inside the polygon.

However, the method has some boundary problems and vertex problems. For example, when the point is on the line segment of the polygon or the line segment of the polygon is on the half-line of the point, it is hard to judge whether the half-line intersects with the line segment. Also, it is to judge when the half-line intersects the intersection of two line segments (the vertex).

To solve the problems above, I set the rules that:

1. Judge whether the point is on the line segment at first.
2. The horizontal edge of the polygon is not considered.
3. For the intersection of line segment vertex and the half-line, judge whether the vertex is the vertex with the larger Y-axis. If the half-line intersects with the smaller vertex, ignore it.

In my code, I define a function to judge whether a half-line to the right of a point intersects a line segment, and also define a function to count the number of intersections and judge whether the point is inside the polygon.

Results:

```
7 11 inside
10 14 inside
11 4 outside
12 21 outside
16 3 outside
16 10 inside
```

17 4 inside
18 7 inside
18 17 outside
20 7 outside