Golf (Solution)

First, by coordinate compression, we may assume that the coordinates are at most $2N$.

Moreover, the answer will not be changed if we further assume that the golf ball passes only the lines extending one of the sides of an obstacle, and the lines parallel to one of the coordinates passing through the start point or the end point. The reason is, if a given route of the golf ball does not satisfy this condition, we will get a valid route if we replace a move in the route by the nearest line by parallel translation because there is no obstacle between them.

Therefore, we extend line segments from each side of each obstacle, the start point, and the end point until they meet other obstacles, and search on them by the **breadth-first search**.

To get full score, we efficiently need to

- enumerate the line segments connected with the current line segment, and
- manage line segments so that we visit each line segment at most once.

For example, this can be implemented by the following way.

We divide each line segment so that we put it on a **segment tree**. Then, in total, the line segments are divided into $O(N \log N)$ parts.

We manage divided line segments by constructing a segment tree for each type of intervals covered by parts of the line segments.

At each interior point of the segment tree, we put the number of line segments in the corresponding interval to which we did not yet visit. At each leaf node, if there is a line segment to which we did not yet visit, we put information about it.

For each line segment parallel to the x-axis, there are at most $O(\log N)$ types of intervals of the y-coordinates of line segments meeting it. While visiting line segments, we do the following: search the nodes of the segment tree corresponding to the interval as long as there is a line segment to which we did not yet visit, and, when we reach a leaf node, we consider the line segment in that node as a candidate of the next state, and remove it from the segment tree.

The total time complexity for search is $O(N \log^2 N)$. We can get full score by this method.