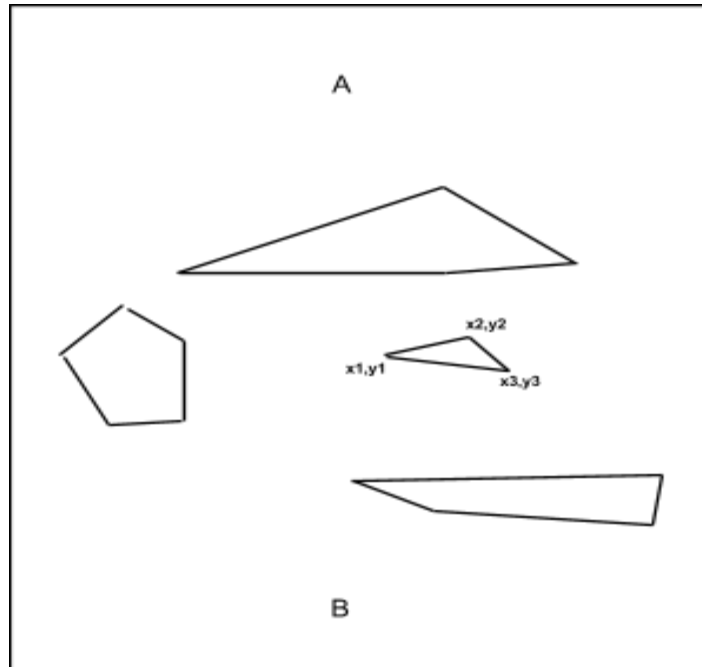


The task

Navigate a ship from point A to point B in the Northern Ocean with icebergs. The path should be as short as possible and not cross any of the icebergs (touching the iceberg is OK).

You can assume all numbers are positive integers (if you wish) and all polygons are convex.



You need to submit

1. A short doc explaining the algorithm and the design
2. The code - document the code as much as possible
3. An example input file (may have as much as 3 icebergs) and its output file.

Input

A file including

1. Integer with number of icebergs
2. A set of 2D polygons representing icebergs boundaries, represented as a set of ordered coordinates. One line for an iceberg, the format: $x1,y1\ x2,y2\ x3,y3$.
3. Position of Start point A in the format x,y
4. Position of End point B in the format x,y

Output

A file including

1. An ordered list of co-ordinates which combine the selected path from A to B not crossing any iceberg. Including A and B.