Intersection of convex polygons

Calculating the intersection of two convex polygons is one of the basic operations of computational geometry. In this assignment a method proposed by O'Rourke et. al. will be implemented. The paper about this method can be found at Nestor. You are asked to read the paper and implement the method, so no further explanation is given. The implementation is a two step process. First implement the method without worrying about degenerate problem instances and in the second step adapt the method so that degenerate problem instances can be handled.

You are requested to explain in the report how the method works, which implementation decisions you made, and which alterations you made in the second implementation compared with the first implementation.

The backbone program, to be found at Nestor, is a start for an interactive implementation. It enables you to interactively create a starting position of two edges of the polygons by pressing the “q” or ”p” key. By pressing the “n” key the algorithm makes one step. Of course you have to create the python code for that part. In the backbone program a data set for the non-degenerate implementation is given and one for the degenerate implementation.

Assignment A:
Implement the method from the paper for non-degenerate problem instances.
Calculate the intersection of P and Q as given in the python code. Verify that your implementation does not depend on the starting position of the two initial edges. Also verify that it can handle the situation that the polygons do not intersect or that one is contained in the other.

Assignment B:
Adapt the implementation from A so that it can deal with degenerate problem instances.
Calculate the intersection of P and degP as given in the python code.