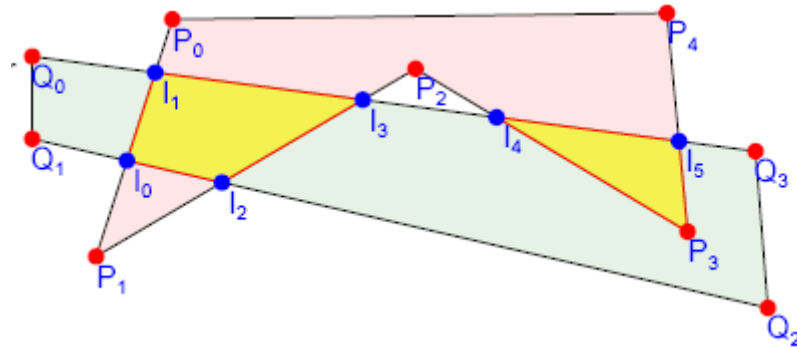


## Weiler - Atherton algorithm

We use this algorithm to find union or intersection of not crossed polygons

We have two polygons P and Q, vertices are given in order



1) We calculate intersections of sides and put them in two lists :  
P0 ; I1 ; I0 ; P1 ; I2 ; I3 ; P2 ; I4 ; P3 ; I5 ; P4 for polygon P  
Q0 ; Q1 ; I0 ; I2 ; Q2 ; Q3 ; I5 ; I4 ; I3 ; I1 for polygon Q

2) We have also list of entering points for P : I1 ; I2 ; I4

3) We begin with first point of entering list I1

We take next point on list for P until we get exiting point I0

We go to list for Q and take next point I2

As I2 is exiting for Q, we go to list for P

As I3 is exiting for P, we go to list for Q

We retrieve point for beginning I1

First common area is polygon I1 I0 I2 I3

4) We delete entering points in this area I1 and I2 from entering list

5) We take last point in entering list I4

We find on P list P3 then I5

As I5 is exiting we go to Q list and find I4

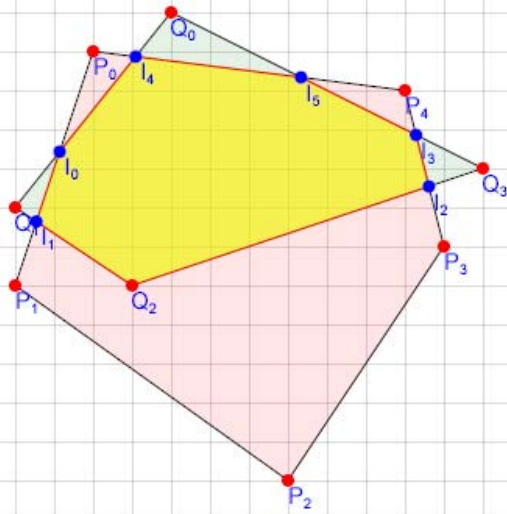
Second common area is I4 P3 I5

As entering list of points is empty, we have all common areas

If polygons are crossed, this algorithm give false results because we cannot decide if a point is entering or exiting for the polygon.

We can use this algorithm to find union of areas, we have only to exchange entering and exiting properties.

You can test this algorithm with embedded svg above



- Intersection
- Union

Add point P  
Remove point P

Add point Q  
Remove point Q