Geometric Intersection

Edge Chasing

- Eliminating Sickles

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❖ [Convex Polygon Intersection Construction]

Given two convex polygons P and Q, //|P| = n, |Q| = m

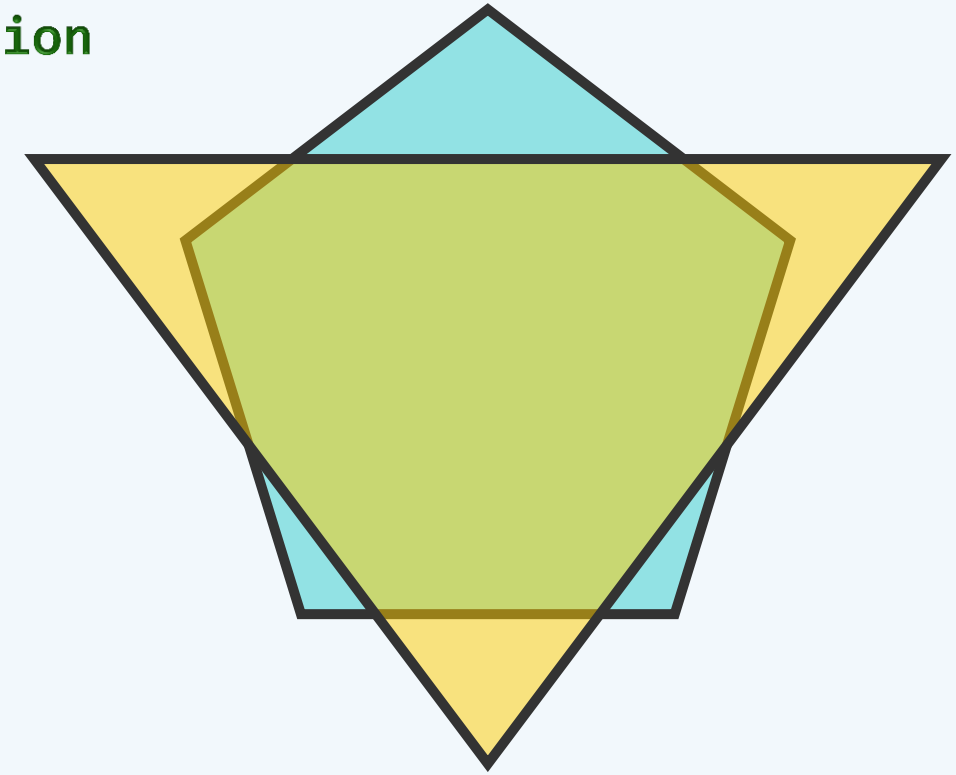
how to construct their intersection

(if non-empty)?

❖ Note that

the intersection can have

up to $O(n + m)$ edges



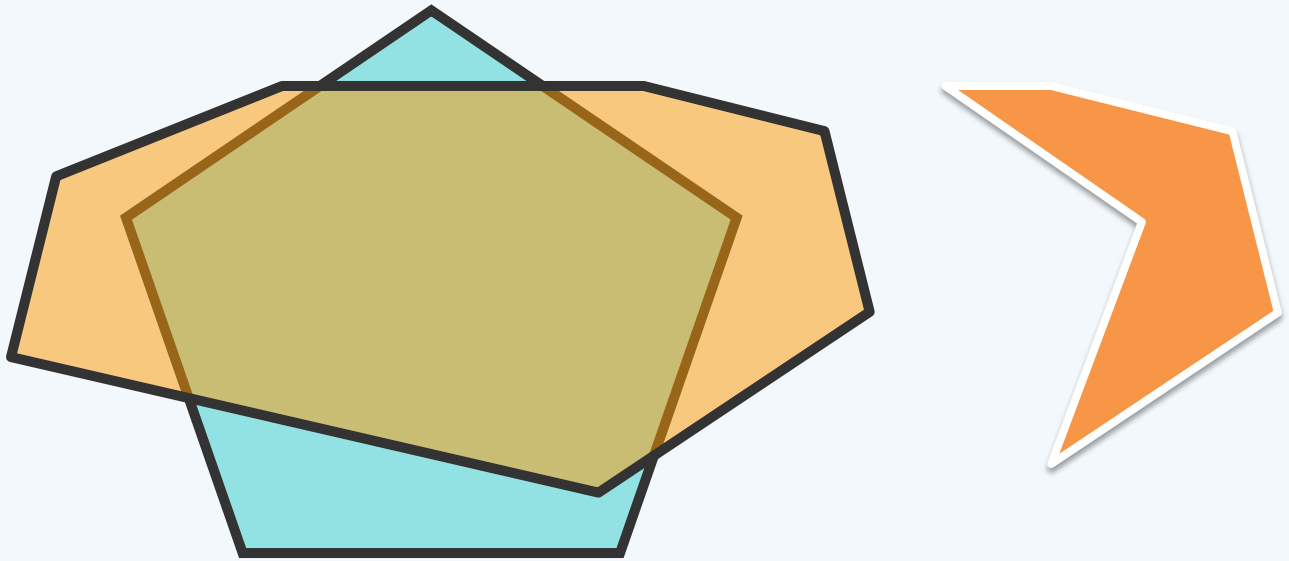
Falcate Areas

- The difference between P and Q

  consists of

  $O(n + m)$

  falcate areas



- Equivalently,

  we will get their common intersection

  by removing all sickles

O'Rourke's Algorithm

❖ Construct_Intersection_Between(P , Q) //Section 7.6, CGIC (2nd edn.)

//Both P and Q are stored as a sorted sequence of edges in CCW order

Perform a traversal of the boundaries of P and Q simultaneously

Maintain a pair of edges during the traversal: $e \in \partial P$ & $f \in \partial Q$

From a consideration of the **relative positions** of these edges

Advance e or f along ∂P or ∂Q