Triangulation

Triangulating Monotone Polygons

- Analysis

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Correctness

❖ First, the SCC is maintained during the entire algorithm run

❖ Besides,

each time a triangle is chopped off,

more properties are satisfied that

the chopping diagonals

- can't be blocked by any edge; and

- can't block or be blocked by any of the old diagonals

❖ Therefore we have that

all diagonals generated by the algorithm are internal ones

Complexity

❖ Note that

- (with both chains sorted already)

  all vertices can be sorted in $O(n)$ time;

- each vertex is pushed into S at most twice

  (once as c and the other time as t); and

- altogether $n - 2$ triangles are chopped off and

  each costs $O(1)$ time

❖ We can now conclude that

  a monotone polygon with n vertices

  can be triangulated in $O(n)$ time