03-G-01

Triangulation

Monotone Decomposition

- Internal Cusps

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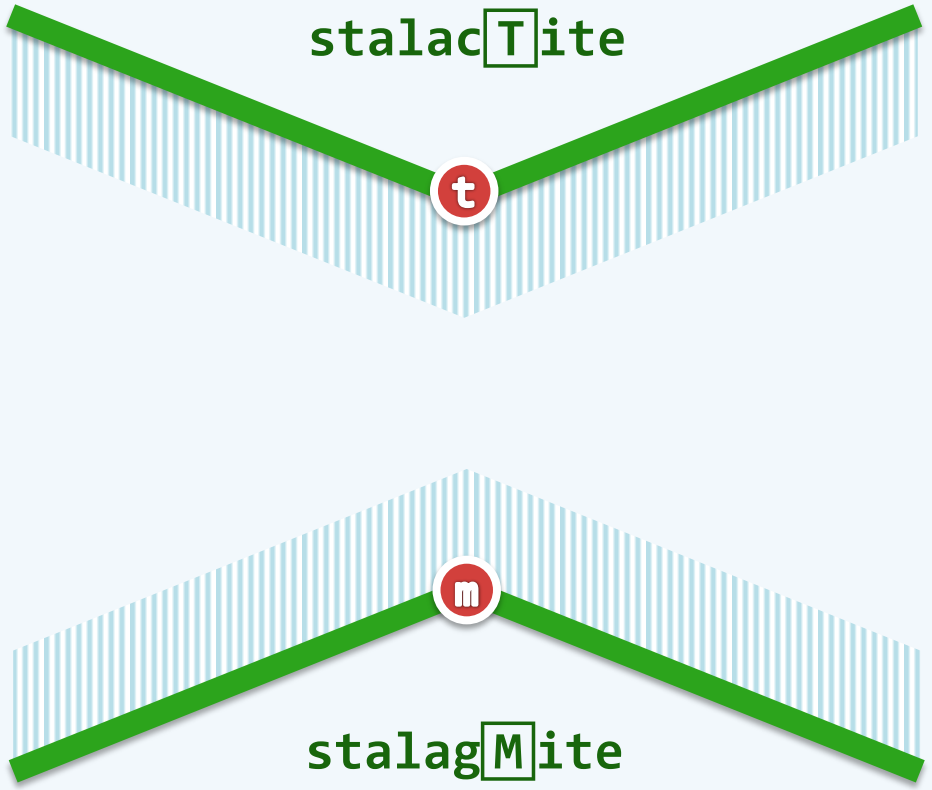
Stalactite & Stalagmite

- A reflex vertex v of a polygon P

  with both its adjacent vertices

  lying higher / lower than it



Monotone Decomposition

- To divide a polygon

  into monotone pieces,

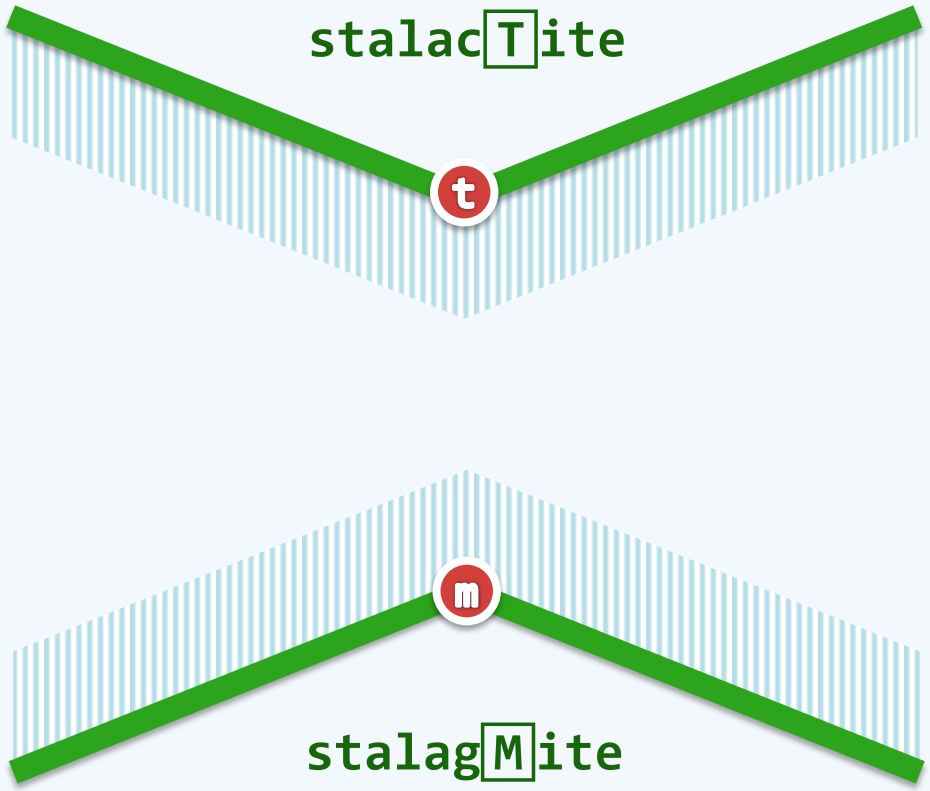
  it suffices to

  break all such cusps

- For sake of simplicity,

  here we only discuss how to

  eliminate all stalagmites



MonotoneDecomposition(SimplePolygon P)

- //For sake of simplicity,

  //we make an assumption on general position that

  //no 2 vertices lie on a same horizontal line

  Sort all vertices by decreasing height into an event queue $\mathcal{E}$

  //v_1, ..., v_n, from top down

  An imaginary horizontal line $\mathcal{L}$ is swept over P from top down

  During the sweep, the sweep line status $\mathcal{S}$ is maintained

  //$\mathcal{S}$ stores information of the polygon in vicinity of $\mathcal{L}$

  At each event, $\mathcal{S}$ is updated and

  perhaps some output (diagonal) is produced