

Exercise 5

DCEL

I have 3 class:

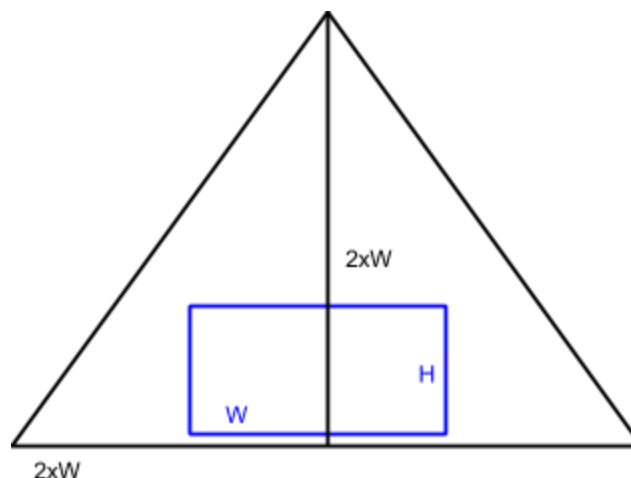
- **Vertice**, represent a point of vertice and the incident edge of triangle.
- **Edge**, represents a middle edge, have the other middle edge of segment, next edge, the face, and the vertex.
- **Face**, represents a face, and have the edge.

Triangulation

The process of the algorithm are the nexts:

1. Create the big triangle to evolve all points.
2. For each point, search the face to insert.
3. Insert the points in the face.
4. Create pruned triangles.
5. Paint the result.

First to **create the big triangle to evolve all points**, I get the minimum and maximum and create the triangle with the high are $2 \times \text{maximumWeight}$, and de weight are $2 \times \text{maximumWeight}$.



For each point search the face using the algorithm visibility walking triangulation, I start in the last insert face and check for each segment of triangle, if the line of segment is between the point and the face, if I found I jump to the next face with reverse edge.

To **insert the point in the face**, I use Delaunay triangulation, for this I want get that all circles creates by the points in triangles are empty, dont have any point inside. I insert the point and check if have empty circle, else, I try with the next vertices, when I found, I insert.

With idxs I create **the pruned triangles**, for this I check every edge of triangle, and check if the edge have vertex of the biggest triangle and remove, then I do the same with idxs and remove if not isn't.

Solution

