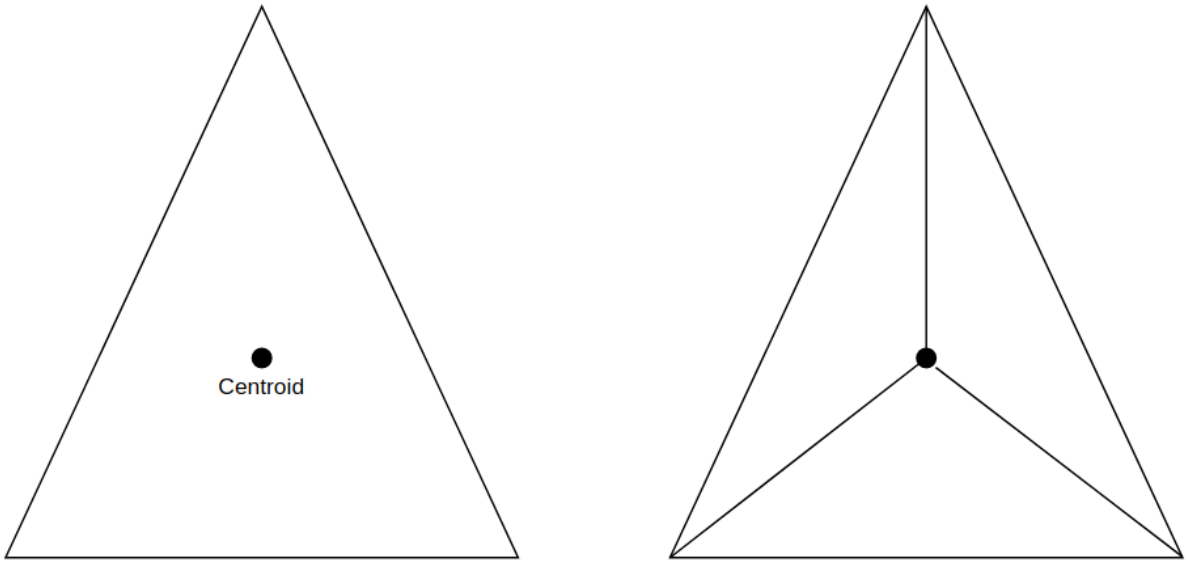
Hiring: Software Task

Task

Your task is to implement **your own** simple mesh subdivision algorithm for triangulated meshes. If you are not familiar with triangulated meshes, you can read up on the concept here: https://en.wikipedia.org/wiki/Triangle_mesh You are supposed to use the centroid of a triangle to split it into three smaller triangles as shown in the Figure below:



Triangles should only be subdivided if certain conditions are met. Write your code in a way that allows for easy enabling/disabling of certain conditions. The conditions are as follows:

- Subdivision only if the triangle area is larger than AREA_THRESHOLD
- Subdivision only if the smallest triangle angle is larger than 45 degrees
- Subdivision only if the Z-Coordinate of all affected vertices is smaller than Z_THRESHOLD

Apply your algorithm to the different meshes in your INPUT folder. Visualize how the number of subdivided triangles changes when you enable /disable certain conditions.

Rules

- Code should be written in python.
- You are allowed to use every tool and library you like. We recommend the library pymesh or the library trimesh for simple mesh processing.
- Put your solution on http://github.com and send the repository link to lea.fritschi@spherene.one
- Your time is valuable. We are not expecting you to spend more than 1-2h on this task. We are not expecting a “perfect” solution. If the time frame does not suffice to complete all tasks, feel free to quickly sketch what you’d do next and hand in an incomplete solution.