Problem 11: De Launay (DL) Triangulation

Due date: 31 March 2026

7. Generate a set of N random points (say, 1000) in a two-dimensional plane within a square region of linear dimension L = 100 such that the distance between any two points is at least 1 or more.

   (a) Construct the DL triangulation of the points using the algorithm discussed in the class. Compare your results with those from a standard program (say, from MatLab).

   (b) Compute the distributions of the area and the maximum angle of the DL triangles. Obtain the average area and the average maximum angle, and their variances. Present your results in a plot.

   (c) Re-compute the distribution by ensuring that the maximum angle of DL triangles do not exceed 150 degree.

   (d) Vary N = 100 to 10,000 in steps of 100 and plot the CPU time vs. N curve.