AADS - Assignment 6

Aditya Fadhillah (hjg708), Mads Nørregaard (gnz359), Nikolaj Schaltz (bxz911)

January 8, 2025

Contents

1 Polygon Triangulation Exercises

1.1 Exercise (a)

Draw the diagonals that the function MakeMonotone(P_1) creates to partition the polygon P_1 into monotone pieces and state the order in which they are created.

Make it clear whether you use the version from the Computational Geometry book that handles everything in one pass or the version from the lecture that first sweeps from top to bottom and then from bottom to top on each resulting polygon.

1.2 Exercise (b)

Draw the diagonals that are created when we call TriangulateMonotonePolygon(P_2) and state the order in which they are created.

2 Exercises from Computational Geometry

2.1 3.4

Suppose that a simple polygon P with n vertices is given, together with a set of diagonals that partitions P into convex quadrilaterals. How many cameras are sufficient to guard P? Why doesn't this contradict the Art Gallery Theorem?

2.2 3.7

Let P be a simple polygon with n vertices, which has been partitioned into monotone pieces. Prove that the sum of the number of vertices of the pieces is O(n)