Motivation
We practise arrangements.

Bounding box
Give an $O(n \log n)$ algorithm to compute an axis-parallel rectangle $R$ that contains all vertices in an arrangement of $n$ lines.

Zone of segment in triangulation
Given a triangulation $T$ with $n$ triangles and a segment $s := \overline{pq}$. Compute all triangles intersected by $s$. Especially take care about degenerate situations.

Trapezoidal decomposition
The trapezoidal decomposition of an arrangement $\mathcal{A}$ induced by a set of curves is given by drawing vertical extensions from each vertex in upward and downward direction. Such an extension is either a segment if it hits another curve, or a ray that extends to infinity.

1. Sketch an algorithm to compute this decomposition.

2. Assume that the arrangement consists of $n_e$ edges and they are in general position. Use a sweep argument to show that the vertical decomposition consists of $3n_e + 1$ trapezoids.

3. Relax the conditions for a trapezoid and show that the upper bound of $3n_e + 1$ trapezoids still holds for edges not being in general position.

Have fun with the solution!