This assignment is on Delaunay triangulations and line arrangements.

1. Give an $O(n \log n)$ time algorithm for the following problem. The input is a set $S$ of $n$ points in the plane and a distance threshold $d > 0$. Partition $S$ into a maximum number of disjoint subsets $S_1, S_2, \ldots, S_k$ such that the minimum distance between two points from different subsets is strictly greater than $d$.

2. Let $\mathcal{A}$ be a line arrangement of $n$ lines in the plane. Let $B$ be the union of all the bounded cells of the arrangement. Show that the boundary of $B$ has $O(n)$ edges of the arrangement. (In the figure below $B$ is shaded and its boundary has 9 edges of the arrangement.)