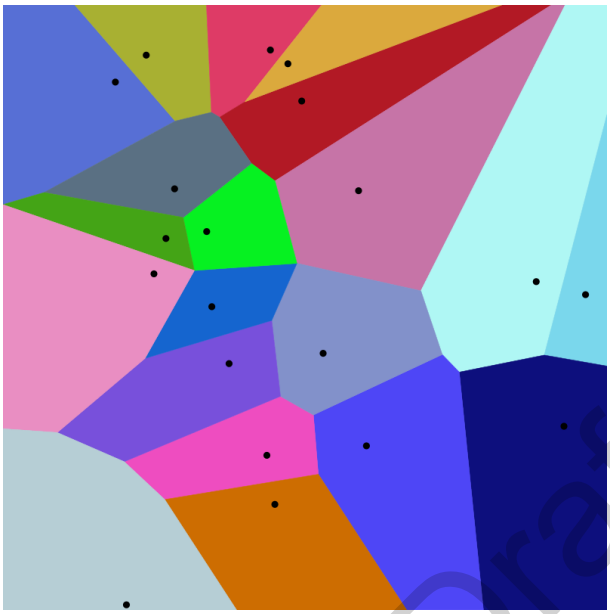
20.20 Voronoi Diagram



Voronoi diagram is a partitioning of a plane into the regions based on distance to the points in a specific subset of the plane. For each seed(point), there is a corresponding region and throughout that region, if any new point falls, that seed will be the nearest point to the newly arrived point.

In 1-NN, each point has only one region, These regions are called Voronoi cells.

Note: Mostly Voronoi diagrams are not used in practice as they become very complex in high dimensional space. Voronoi diagrams are mostly used in theoretical evaluation of K-NN and in a sub-area of computer science called Computational Geometry.

The partitions dividing two regions are equidistant from the points. All the vertices are equidistant from the points. The Voronoi diagram is related to K-NN with K=1. Just like Logistic Regression has a hyperplane as the decision surface, the decision surface for 1-NN is a voronoi diagram. But in ML, voronoi diagrams aren't much used in practice.