Q2: Explain difference between KNN Classifier vs KNN Regression methods

KNN Regression

1) Given a value K and a prediction point p_0, KNN regression first identifies the K points closest to p_0 : N_0 - the neighborhood

2) Next it estimates $f(x_0)$ using the average of all the training responses in N_0

$$\hat{f}(x_0) = \frac{1}{K} \sum_{x \in N_0} y_i$$

KNN Classifier

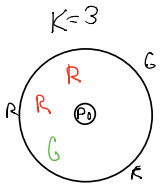
KNN Classifier simply took the closet K neighbors to determine which class a point belongs to.

1. Determine the neighborhood for p_0 given K : N_0

$$Pr(Y = j \mid X = x_0) = \frac{1}{K} \sum_{i \in N_0} I(y_i = j) \quad (2.12)$$

Euclidian Distance

$$\text{distance} = \sqrt{x^2 + y^2}$$



$\frac{2}{3}$ Red, $\frac{1}{3}$ Green $\Rightarrow$ p_0 is red