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ASSIGNMENT

Working Principle of K-Nearest Neighbour (KNN) Algorithm

The K-Nearest Neighbours (KNN) algorithm is a supervised machine learning algorithm used for both classification and Regression task.

→ Working Principle

1. Choose the value of K.
   Select the number of neighbours (k). It is usually a small positive integer (like 3, 5 or 7)
2. Calculate Distance
   For the given test data, compute the distance between this point and all points in the training dataset.
   The most commonly used distance metric is the Euclidian Distance

$$d(p,q) = \sqrt{(p_1 - q_1)^2 + (p_2 - q_2)^2 + \dots + (p_n - q_n)^2}$$

   where
   $p = (p_1, p_2, \dots, p_n)$ → test data point
   $q = (q_1, q_2, \dots q_n)$ → training data point
3. Find the K Nearest Neighbours
   Sort all the distances and select the K pt.
4. Vote or Average
   i) For classification the majority class among the K nearest neighbours is assigned to the test point.
   ii) For regression, the average of the K nearest neighbours value is taken as the predicted value.
5) Return the Output
   The predicted class or value is returned as the output of the given test data.