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BE Comp 2

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ML Practical 8

Title: KNN Classification

1) What are the applications of K-NN?

Ans. 1. Classification and Interpretation :- legal, medical, news, banking.

2. Problem solving : Planning, pronounciation.

3. Function learning : Dynamic control.

4. Teaching and Aiding : Help Desk, User training

5. Used to get missing values and in pattern recognition.

2) What is sklearn.neighbors and its functions?

Ans 1. sklearn.neighbors provides functionality for unsupervised and supervised neighbors based learning methods.

2. The principle behind nearest neighbor method is to find a predefined number of training samples closest in distance to the new point and predict the label from these.

3. The number of samples can be a user defined constant or vary based on local density of points.

4. Neighbor based methods are known as non-generalizing machine learning methods since they simply remember all of its training data.

5. Functions of sklearn.neighbors :

(i) fit (x, y) : Fit the model using x as training data and Y as test data.

(ii) get_params : get parameters for the estimator.

(iii) kneighbors (x, n_neighbors = None, return_distance = True) : finds the k-neighbors of a point. Returns distance.

(iv) predict (x) : predicts class labels.

(v) score (x, y) : returns mean-accuracy

(vi) set_params (** params) : set parameters of the estimator.

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3) Explain Distance weighted K-NN with example

Ans. 1. weighted K-NN is a modified version of K-NN.

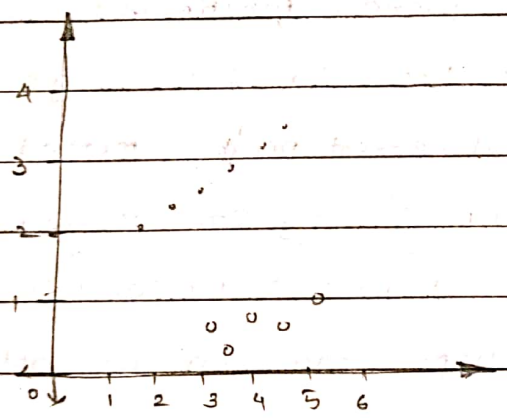
2. One of the many issues that affect performance of the K-NN algorithm is the choice of hyperparameter.

3. This method follows rule of taking the majority note but this can be a problem if neighbors vary widely in their distance and closest neighbors more reliably indicate the class of project.

4. The idea is to weight the contribution of each of the k-neighbors according to their distance to the query.

5. So the closer neighbor, the more important it is.

Example.



The shaded labels indicate the class 0 points and the lined labels indicate class 1 points.