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Lab - 6

KNN

KNN is a simple supervised learning algorithm that can be used for classification / regression tasks.

Pseudocode

Input:
→ Dataset D with features X and labels Y
→ Test instance x_test
→ Number of neighbour k

Procedure

1. For each training instance (x_train, y_train) in D:
   a. compute the distance btwen x_test and x_train
   b. Store the distance and the corresponding label y_train
2. Sort all distances in ascending order
3. select the top k nearest neighbours
4. Count the frequency of each class among the k neighbours
5. Predict the class with the highest frequency.

$$distance = \sqrt{\sum (x_{test} - x_{train})^2}$$

Code

```
from sklearn.datasets import load_iris
from sklearn.model_selection train_test_split
from sklearn.neighbours import
KNeighboursClassifier

iris = load_iris()
x, y = iris.data, iris.target

x_train, x_test, y_train, y_test =
train_test_split(x, y, test_size = 0.2)

Knn = KNeighboursClassifier(n_neighbours = 3)

Knn.fit(x_train, y_train)

y_pred = knn.predict(x_test)
```