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### EXERCISE-05

# K-NEAREST NEIGHBOUR ALGORITHM

### INTRO DUCTION

K-Meacest Neighbour is one of the simplest machine learning algorithms based on supervised learning Technique. KNN Algorithm Assumes the similarity between new cases data and available cases and put the new cases into the category that is most similar to the available categories. It sloves all the available data and classifies a new data point based on similarity KNN Algorithm can be used for Regression as well as for classification. But mostly it is used for classification problem. It is a non-parametric algorithm, which means it doesn't make any assumptions on underlying data. It is also called Razy Learners Algorithm because it does not learn from the training set, Instead it shores the dataset.

Why KNN Algorithm is used ?

suppose there are two categories, i.e., category A and category B, and we have a new data point XI

So this data point will lie in which of these categories. To solve this type of problem, we need a KNN algorithm. With the help of KNN, We can easily identify the category or class of a particular dataset.

### AIM

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To implement kNN Algorithm.

#### ALGORITHM

- Load the data
- Choose K Value For each data point in the data,
  - Find the Euclidean dutance to all training data samples.
  - store the distances on on ordered list and sortit.
  - Choose the top k entires from the sosted lut.
  - Label the lest point based on the majority of classes present in the selected points.

#### - End.

To validate the accuracy of the KNN classification, a confusion matrix is used other statistical methods such as the liklihood- Ratio test are also used for and the second second validation.

There is no particular way to determine the best Value of k; so we need to try some value to find the but out of them.

### OUTPUT

Extracting Features
['sepal length (cm)', 'sepal width (cm)', `petal length (cm)', `petal width (cm)']
Extracting Targets
['setosa' 'Vericolor' 'Virginica']
Number of eows of columns in test data  (45,4)
Number of eous of vlime in train clata (105,4)
Accumacy The Total
0.944774477777777
Predicted values ['Vexicolor']

## PROGRAM from skleam datasets import load ini ieis = load\_isis() = ixis data = in target pmit ("--. print ("Extracting features \n") f\_name = 1815. feature\_names print(f\_name) print (u\_\_\_\_\_\_ point ("Extracting Targets\n") t-name = iris target\_names print (t-name) from skleam model-selection import train\_test-split x\_train, x\_test, y\_train, y\_test = train\_test\_split (x, y, test\_ -813e = 0.3, 2amdom\_state = 1) print ("\_\_\_\_\_ print ("Number of rows of columns in test data in") print (x\_tat.shape) pmt (4\_ - - print ("Number of sours of (olums in the train dataln") Pomt (x\_train.shape).

from shier in Cartacte mapper that was Owa hoor - wife wish is x y = 1000 - Wallet payer ("Extracting to australia") France 1811 (ceture shower por to ("Extendency rangels so") from akteen recold-retection import think the \* Just X tot, X tot, X tot = bow but The The X ing to symptom, white it is a painty (1) Kink ("Alamba if come if colonia is, but literal parit (x tut shipe) 1) Just (1) thing troubly by most by storman of the

from skleam neighbours import	KNeighbors Classifier
C-knn=kNéighbors Classifler (n-ne	
(_knn.fit (x_txain, y_txain)	0
y_pred = (-knn.predict (x_test)	
from akleam import metrices	
print("	")
peint ("Accuracy h")	
point (motrics · accuracy_score (	y_test, y_pred))
Sample = [[5,5,3,2]]	
pred = c-knn. predict (sample)	
pred_value = [iris.taget_nam	w[P] for P in pred
print("	")
point (" predicted Valuaby")	
pmt(pred_val)	fu.
pmt("	

### RESULT

The program is encluded successfully and the output is verified.