

.KNN

24 May 2023 21:47

- * It comes under Supervised Learning
- * KNN can be used to solve both Regression and classification.
- * If target is Continuous \rightarrow KNN Regressor
- * If target is categorical \rightarrow KNN Classifier.
- * KNN will anyone similar things exists in closer proximity.
- * KNN algorithm relies on Similarities and distance measures to make prediction.
- * KNN algorithm is distance based learning because it will make use of distance measures.

Imp

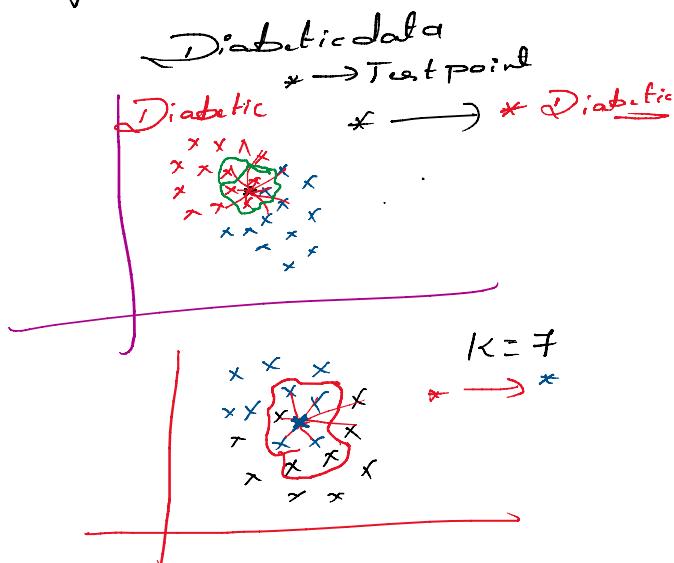
- * KNN Algorithm is called as lazy algorithm because it will not learn anything during training.
- * KNN is instance based Learning.
- * KNN learns everything during testing process

what is K in KNN?

$K \rightarrow$ nearest neighbors

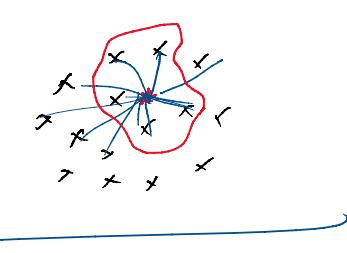
How KNN works?

- ① Plot data
- ② Take test point
- ③ find distance between test point and all other points.
- ④ Define K , $K=5$
- ⑤ It will look for 5 nearest points to the test point
- ⑥ classify test point to one of the class based on majority voting.



Regression

- * Take test point
- * Find distance
- * $K=5$
- * It will choose 5 neighbors
- * To make prediction we take average of nearest neighbors



KNN Regressor

\rightarrow Average of nearest neighbors

KNN Classifier

\rightarrow Majority voting.

K should always be odd.

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How to Select k ?

→ $\frac{1}{k}$ of trials

Continuous data

K-Nearest Regressor

→ Average

Evaluate

④ MSE, MAE, RMSE
R_PC_R, adjusted R²

Categorical target

K-Nearest classifier

→ Majority voting

Evaluate

Confusion matrix, accuracy,
recall, precision, f1 score, Auc-Roc

```
from sklearn.neighbors import KNeighborsRegressor
```

```
From sklearn.neighbors import KNeighborsClassifier
Model=KNeighborsClassifier(n_neighbors=3)
Model.fit(x_train,y_train)
Y_pred=model.predict(x_test)
```