Machine Learning In Python

Subject : Classification Using KNN

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Hamedan University of Technology

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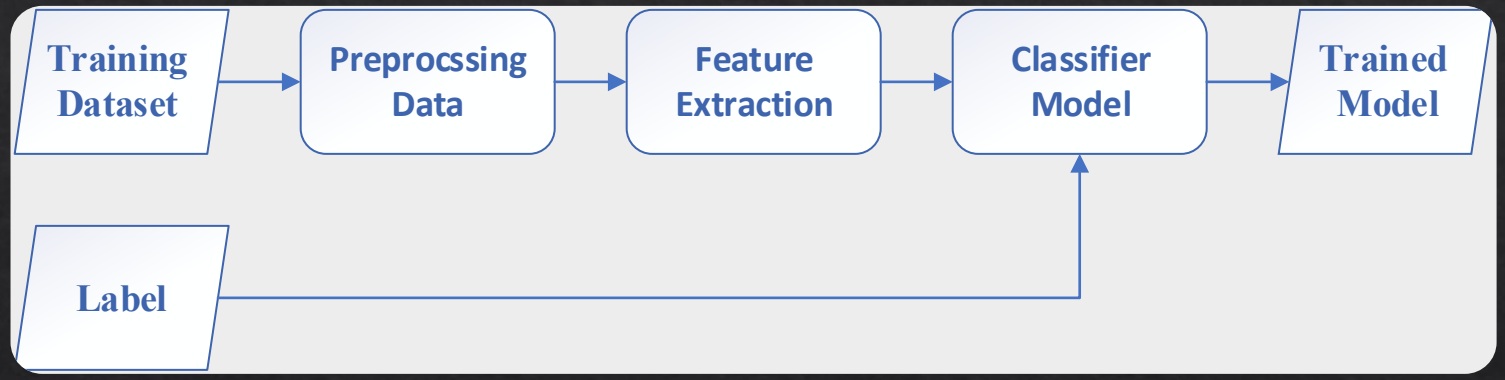
Classification Using KNN

Classification In Supervised Learning Framework

Training Phase



Testing Phase

Classification Using KNN

Classifier Models :

K Nearest Neighbors (KNN)

- KNN is a supervised classification algorithm which uses the distance between samples in the feature space to classify them.
- KNN is a lazy learning algorithm because it does not have a specialized training phase and uses all the data for training while classification
- The training phase of the algorithm consists only of storing the feature vectors and class labels of the training samples.
- KNN is also a non-parametric learning algorithm because it doesn’t assume anything about the underlying data.
- The number of neighbors is determined by K.

Classification Using KNN

Classifier Models :

K Nearest Neighbors (KNN)

Training phase

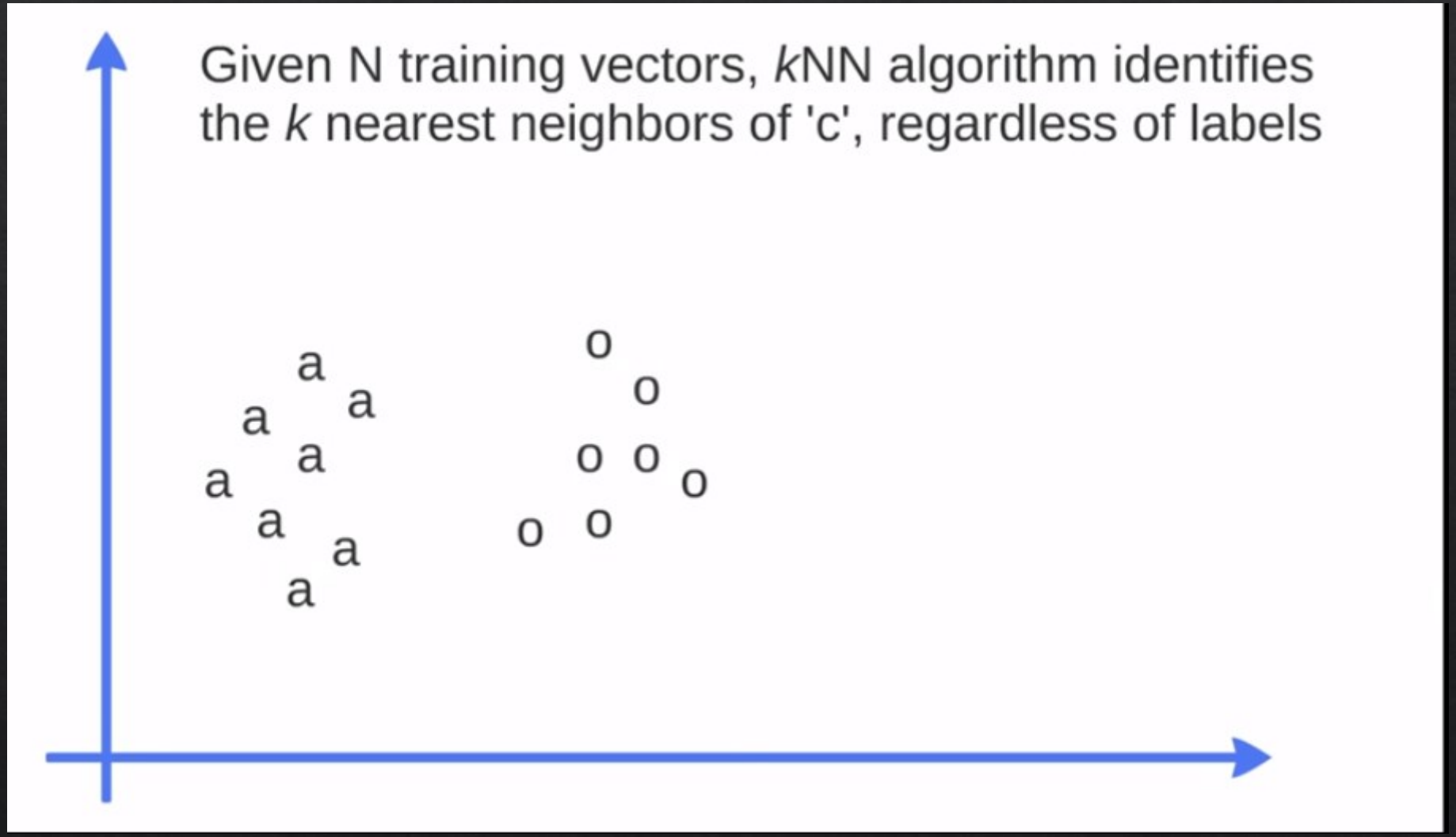
- **Representing all training samples in the feature space**

Testing phase

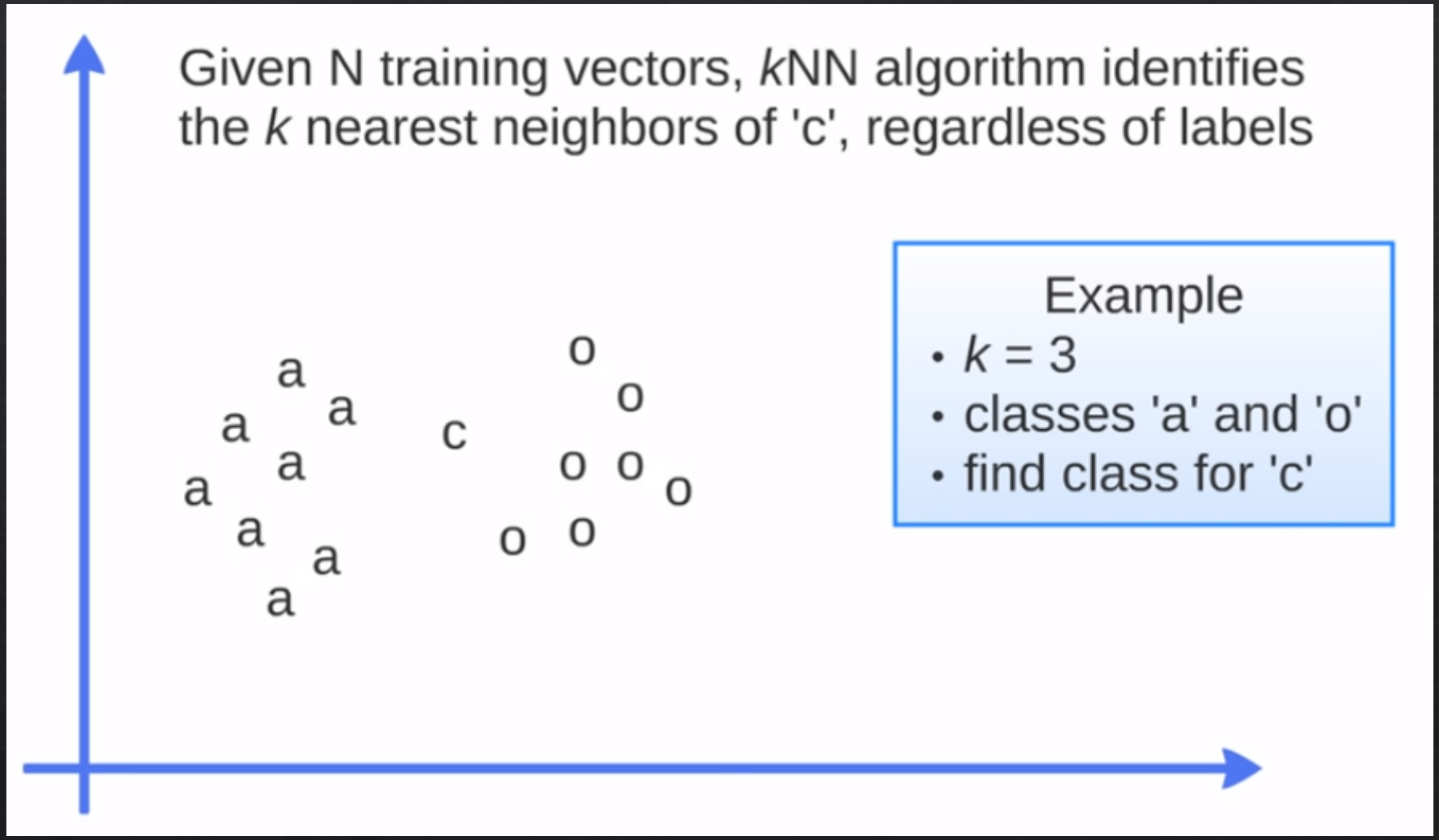
- **Calculate the distance between testing sample to find K nearest neighbors**
- **The labels of K nearest neighbors are counted**
- **The testing sample belongs to a class with maximum counted labels**

Classification Using KNN

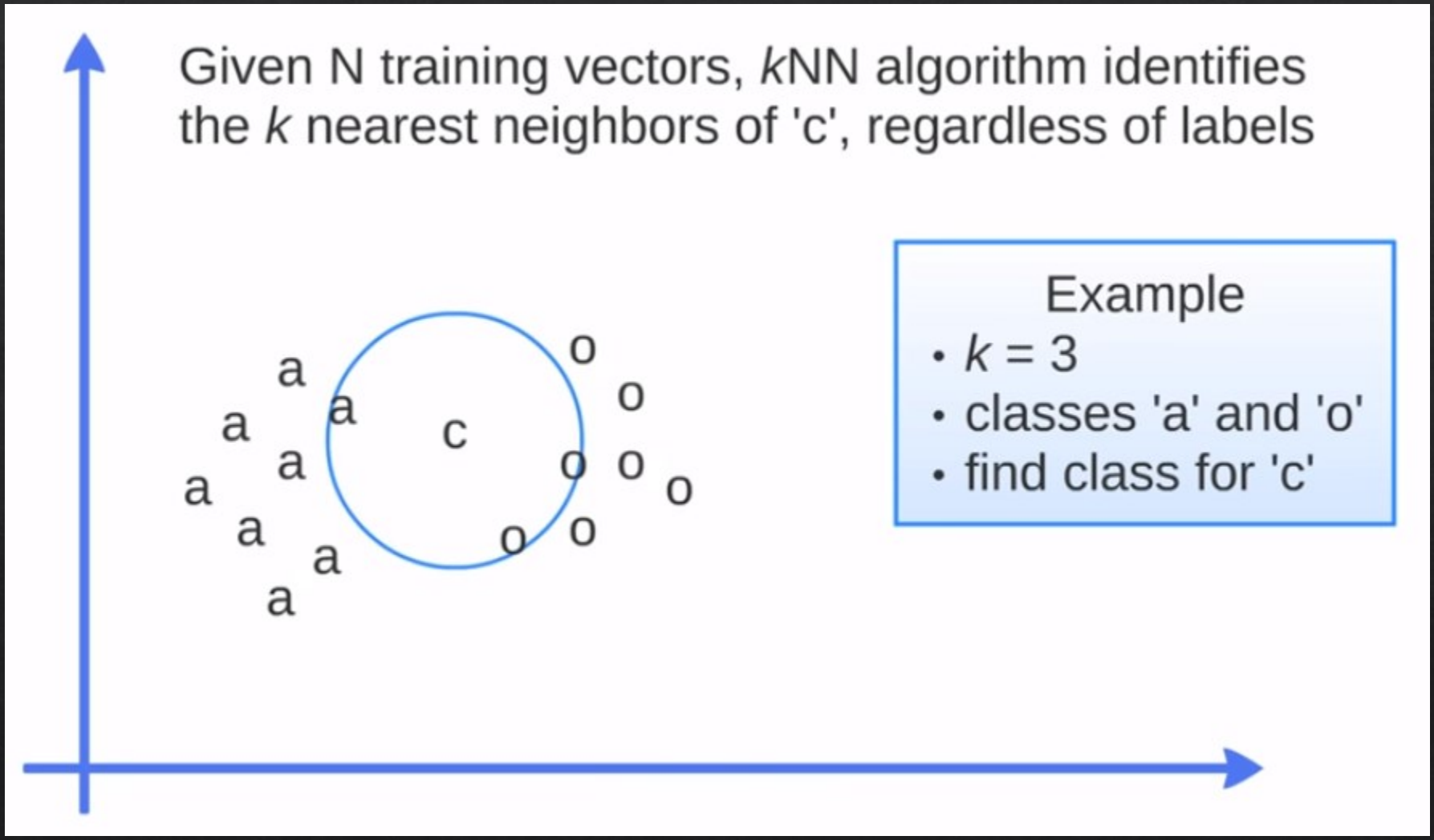
Classification Using KNN



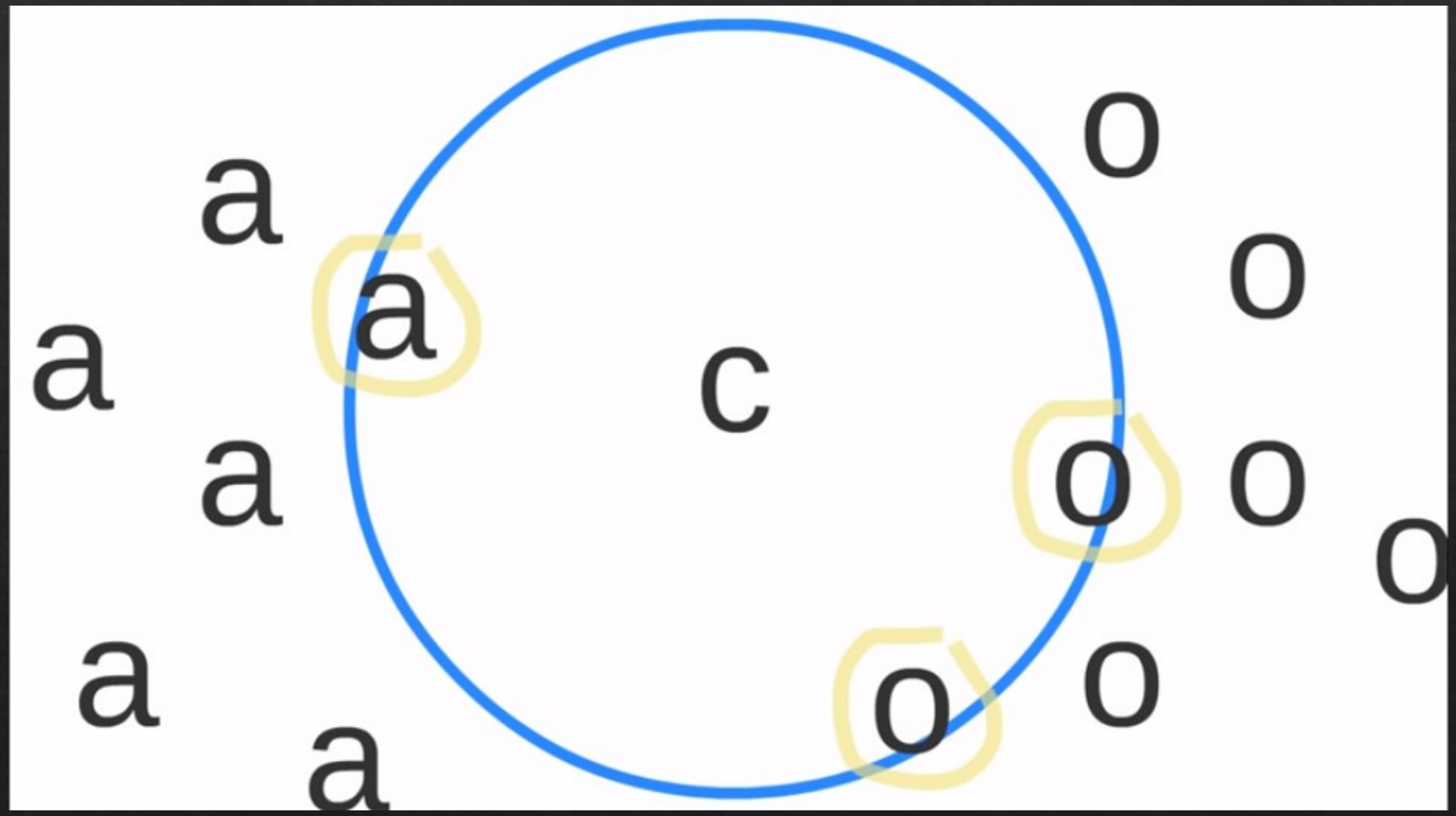
Classification Using KNN



Classification Using KNN

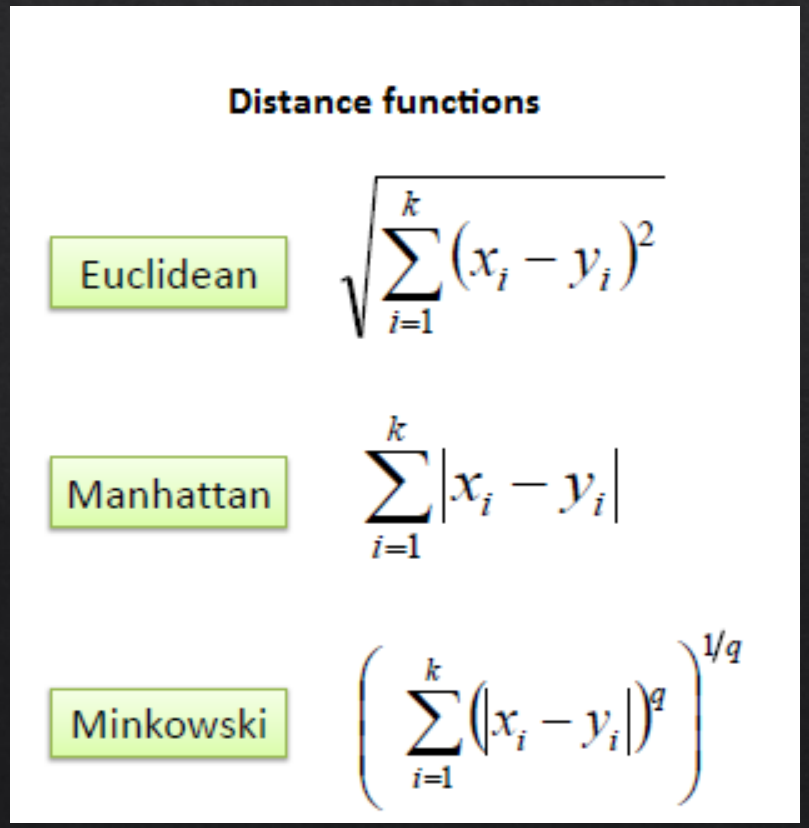


Classification Using KNN



Classification Using KNN

Distance Calculation Metrics in KNN



Classification Using KNN

Remarks about KNN

- Choose an odd value of K for binary classification problems.
- K must not be a multiple of the number of classes.
- The main drawback of KNN is the complexity in searching the nearest neighbors for each sample.