Machine Learning In Python

Subject : Classification Using SVM

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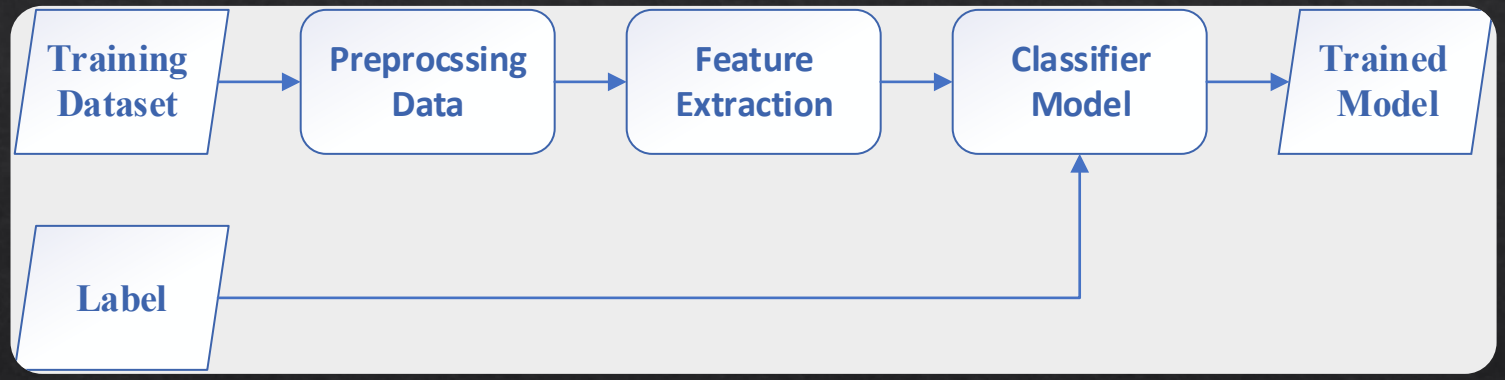
Classification Using SVM

Classification In Supervised Learning Framework

Training Phase



Testing Phase

Classification Using SVM

Classifier Models :

Support Vector Machine (SVM)

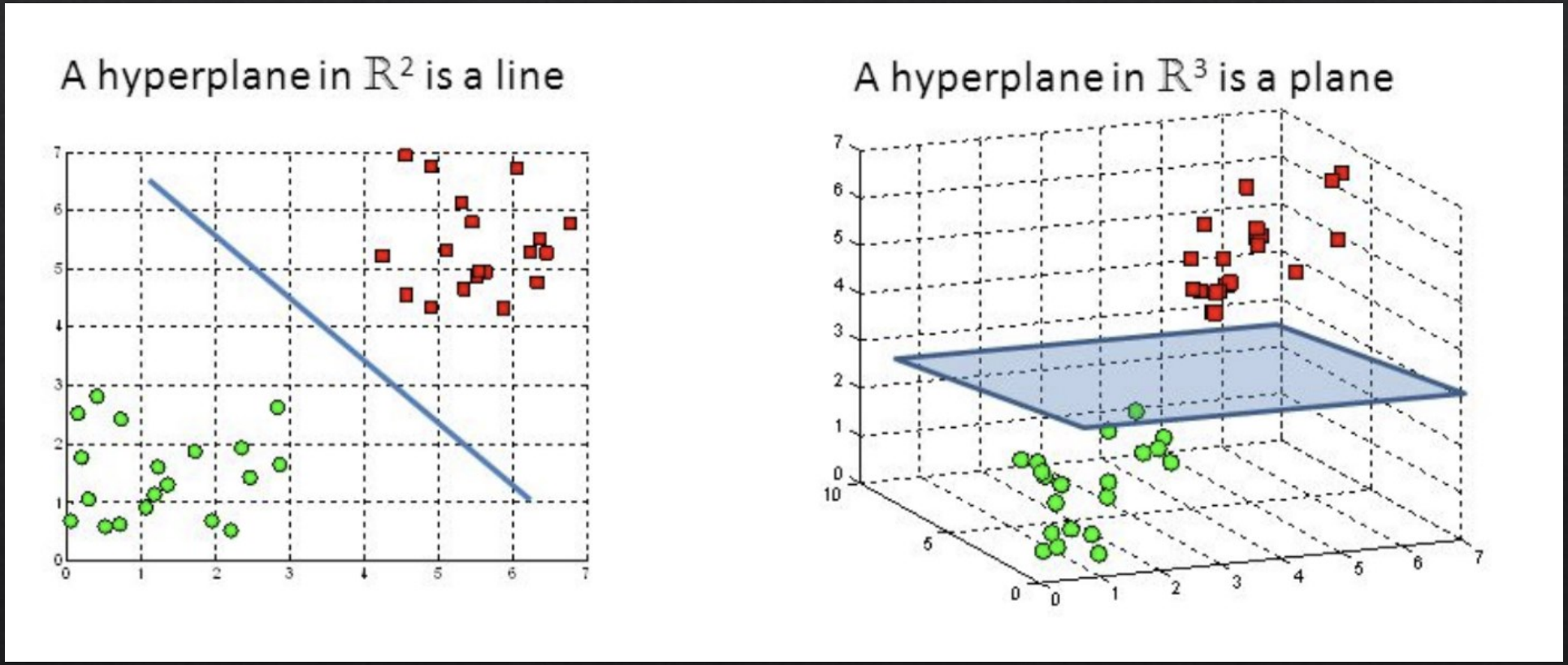
- The objective of the support vector machine algorithm is to find a hyperplane with a specific margin in an N-dimensional space(N is the number of features) that distinctly classifies the data points.

- In the training stage, It finds an optimum hyperplane surface with a specific margin with the most separability between classes

- It divides feature space into the different classes.

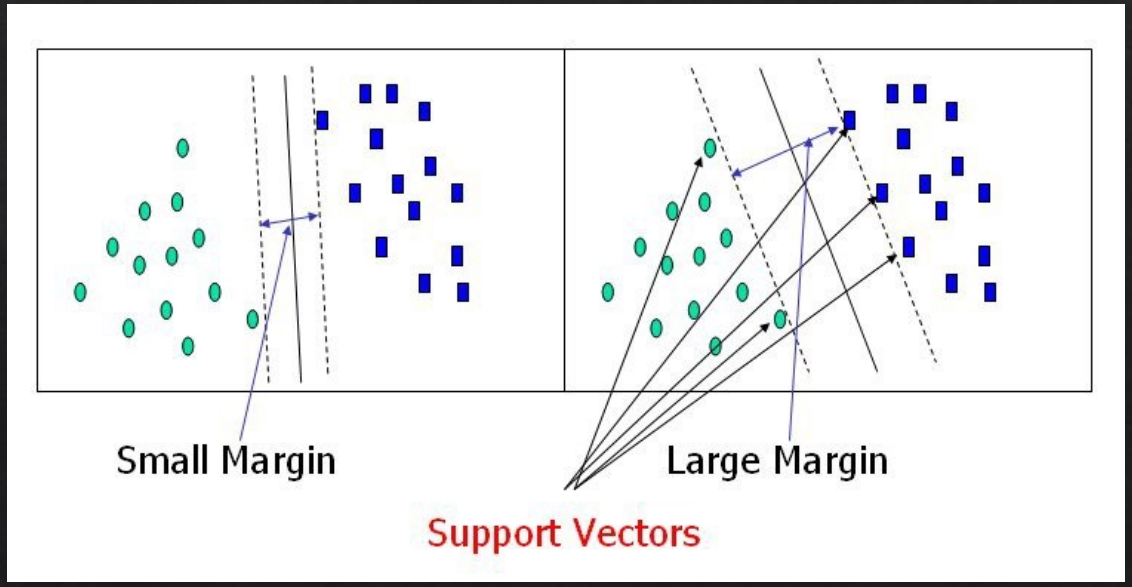
Classification Using SVM

Some examples of created hyperplanes by SVM.



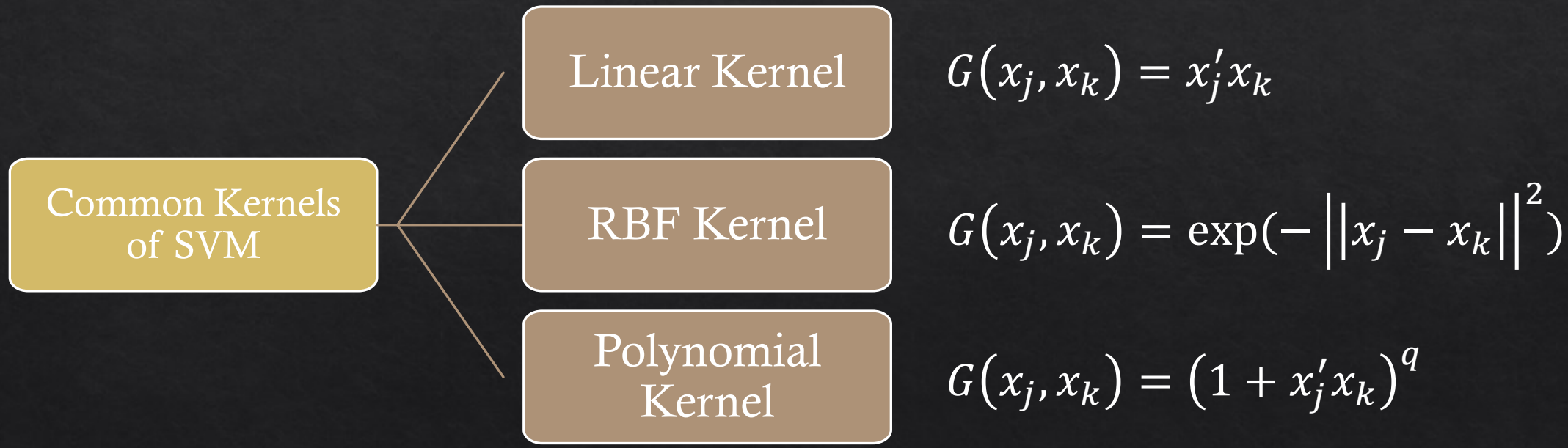
Classification Using SVM

- To separate the two classes of data points, there are many possible hyperplanes that could be chosen.
- Our objective is to find a plane that has the maximum margin, i.e the maximum distance between data points of both classes.
- Maximizing the margin distance provides some reinforcement so that future data points can be classified with more confidence.

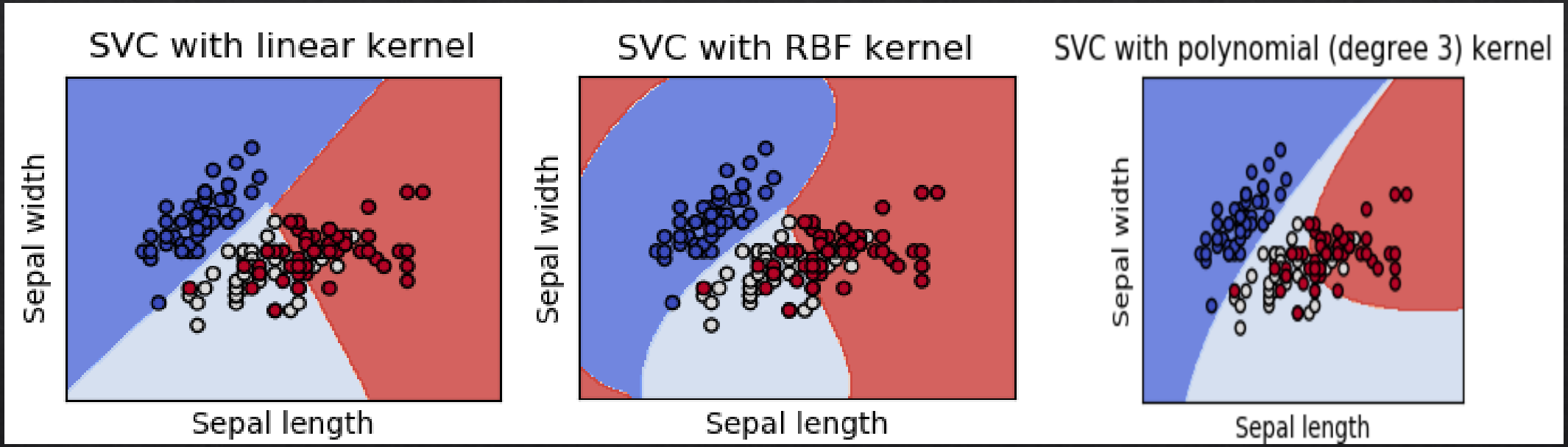


Classification Using SVM

- Nowadays, SVM classifier is developed through different approaches.
- One of these approaches is the Kernel Trick.
- The Kernel Trick means that the SVM classifier finds an optimum kernel surface with maximum margin between classes.



Classification Using SVM



Classification Using SVM

Wine recognition dataset

7.2.6. Wine recognition dataset ¶

Data Set Characteristics:

Number of Instances:	178 (50 in each of three classes)
Number of Attributes:	13 numeric, predictive attributes and the class
Attribute Information:	• Alcohol • Malic acid • Ash • Alcalinity of ash • Magnesium • Total phenols • Flavanoids • Nonflavanoid phenols • Proanthocyanins • Color intensity • Hue • OD280/OD315 of diluted wines • Proline

- **class:**
  - class_0
  - class_1
  - class_2

Classification Using SVM

Wine recognition dataset

This is a copy of UCI ML Wine recognition datasets. https://archive.ics.uci.edu/ml/machine-learning-databases/wine/wine.data

The data is the results of a chemical analysis of wines grown in the same region in Italy by three different cultivators. There are thirteen different measurements taken for different constituents found in the three types of wine.

Original Owners:

Forina, M. et al, PARVUS - An Extendible Package for Data Exploration, Classification and Correlation. Institute of Pharmaceutical and Food Analysis and Technologies, Via Brigata Salerno, 16147 Genoa, Italy.

Citation:

Lichman, M. (2013). UCI Machine Learning Repository [https://archive.ics.uci.edu/ml]. Irvine, CA: University of California, School of Information and Computer Science.