DATA SCIENCE WITH PYTHON : SUPPORT VECTOR MACHINES #424

Name: Deepthi M

Serial Number: 172

Batch Number: 05

Support Vector Machine(SVM)

- Support Vector Machine is a Supervised Machine Learning model which is used for both classification and regression problems.
- The goal of SVM is to create a best line that can segregate the n dimensional space into classes, so that when new data is put in space, it can identify the correct class.
- The best line is known as hyperplane.
- When the data is linear, hyperplane is known as straight line and when data is non linear hyperplane is a plane.
- SVM chooses vectors that help in creating the hyperplane and these vectors are known as support vectors
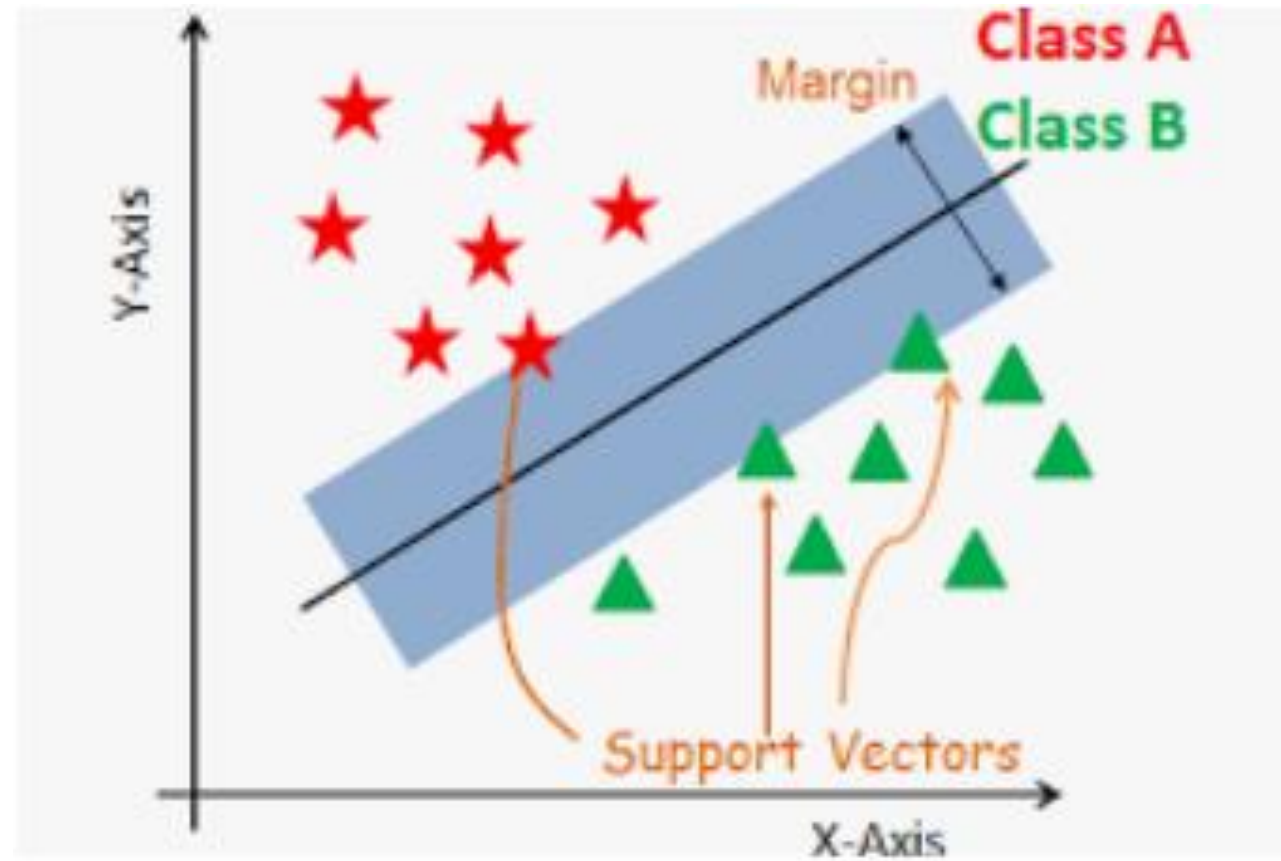
SVM can be of two types:

•**Linear SVM:**

Linear SVM is used for linearly separable data, which means if a dataset can be classified into two classes by using a single straight line.

•**Non-linear SVM:**

Non-Linear SVM is used for non-linearly separated data, which means if a dataset cannot be classified by using a straight line.
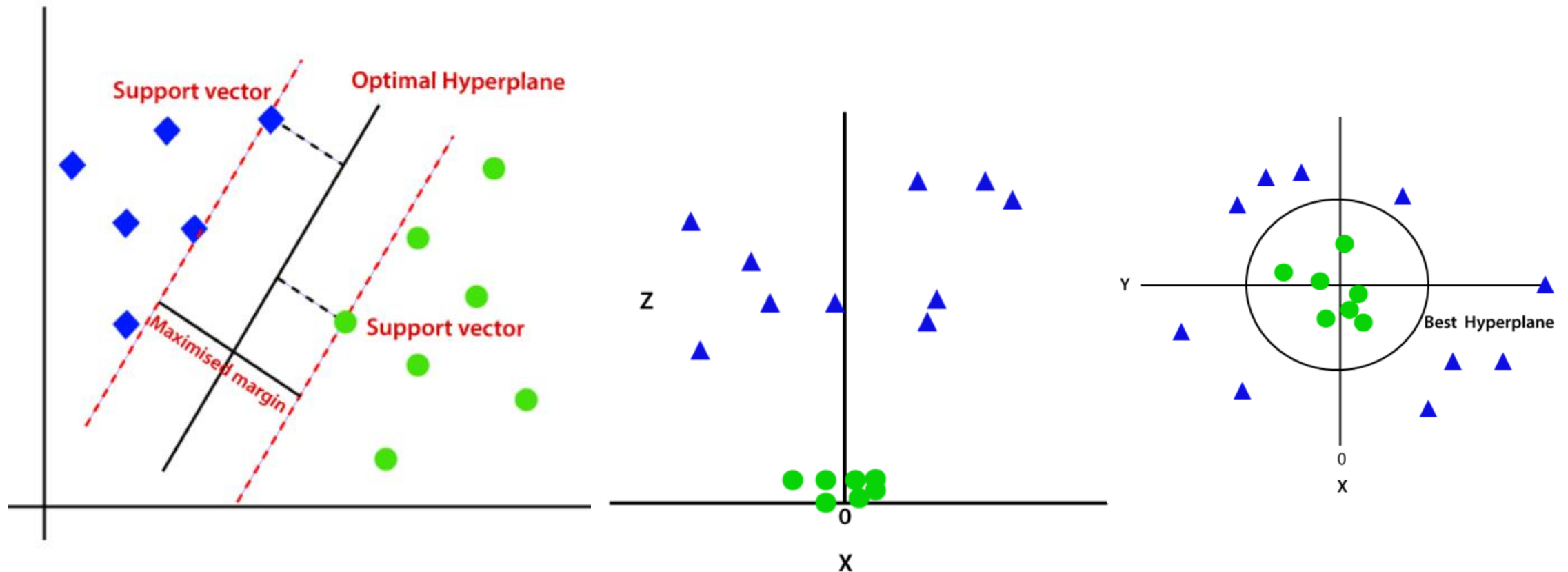
How does SVM works?

Linear SVM:
It chooses best fit hyperplane with the help of support vectors and performs the algorithm on 2D dimensional plane.

Non-linear SVM:
It chooses the best fit hyperplane with the help of support vectors by visualizing the data points on 3D plane.

Advantages:

1.SVM works relatively well when there is a clear margin of separation between classes.

2.SVM is more effective in high dimensional spaces.

3.SVM is effective in cases where the number of dimensions is greater than the number of samples.

4.SVM is relatively memory efficient

Disadvantages:

1.SVM algorithm is not suitable for large data sets.

2.SVM does not perform very well when the data set has more noise i.e. target classes are overlapping.

3.In cases where the number of features for each data point exceeds the number of training data samples, the SVM will underperform.

4.As the support vector classifier works by putting data points, above and below the classifying hyperplane there is no probabilistic explanation for the classification.