**Machine Learning**

A machine learning algorithm can be related to any other algorithm in computer science. An ML algorithm is a procedure that runs on data and is used for building a production-ready machine learning model.

**Types of Machine Learning:**

There are three types of Machine Learning Algorithm:

* Supervised Machine Learning Algorithms
* Unsupervised Machine Learning Algorithms
* Reinforcement Machine Learning Algorithms

**Common Machine Algorithms:**

Common Machine Algorithms are:

* Naive Bayers Classifier Algorithm
* K Means Clustering Algorithm
* Support Vector Machine Algorithm
* Apriori Algorithm
* Linear Regression
* Logistic Regression
* Artificial Neutral Networks
* Random Forests
* Decision Tree
* Nearest Neighbours

**Support Vector Machine Algorithm (SVM):**

Support Vector Machine is a **supervised machine learning algorithm** for classification or regression problems where the dataset teaches SVM about the classes so that SVM can classify any new data. It works by classifying the data into different classes by finding a line (hyperplane) which separates the training data set into classes. As there are many such linear hyperplanes, SVM algorithm tries to maximize the distance between the various classes that are involved and this is referred as margin maximization. If the line that maximizes the distance between the classes is identified, the probability to generalize well to unseen data is increased.

**Categories of Support Vector Machine Algorithm:**

Support Vector Machine is classified into two categories:

* **Linear SVM’s:** In linear SVM’s the training data i.e. classifiers are separated by a hyperplane.
* **Non-Linear SVM’s:** In non-linear SVM’s it is not possible to separate the training data using a hyperplane. For example, the training data for Face detection consists of group of images that are faces and another group of images that are not faces (in other words all other images in the world except faces). Under such conditions, the training data is too complex that it is impossible to find a representation for every feature vector. Separating the set of faces linearly from the set of non-face is a complex task.

**Advantages of using Support Vector Machine:**

Advantages of using Support Vector Machine are:

* It offers best classification performance (accuracy) on the training data.
* It renders more efficiency for correct classification of the future data.
* The best thing about SVM is that it does not make any strong assumptions on data.
* It does not over-fit the data.

**Application of Support Vector Machine:**

The SVM algorithms are used in many technologies which incorporate the use of segregation and distinction. The real-life applications it ranges from image classification to face detection, recognition of handwriting and even to bioinformatics.

It is also used for stock market forecasting by various financial institutions. For instance, it can be used to compare the relative performance of the stocks when compared to performance of other stocks in the same sector. The relative comparison of stocks helps manage investment making decisions based on the classifications made by the SVM learning algorithm.

Data Science Libraries in Python to implement Support Vector Machine –SciKit Learn, PyML, SVM struct Python, LIBSVM.