**Supervised Learning**

The machine learning algorithm is provided with a large enough example input dataset respective output or event/class, usually prepared in consultation with the subject matter expert of a respective domain. The goal of the algorithm is to learn patterns in the data and build a general set of rules to map input to the class or event. Broadly, there are two types commonly used as supervised learning algorithms.

**1) Regression**

The output to be predicted is a continuous number in relevance with a given input dataset. Example use cases are predictions of retail sales, prediction of number of staff required for each shift, number of car parking spaces required for a retail store, credit score, for a customer, etc.

**2) Classification**

The output to be predicted is the actual or the probability of an event/class and the number of classes to be predicted can be two or more. The algorithm should learn the patterns in the relevant input of each class from historical data and be able to predict the unseen class

or event in the future considering their input. An example use case is spam email filtering where the output expected is to classify an email into either a “spam” or “not spam.”

Building supervised learning machine learning models has three stages:

1. Training: The algorithm will be provided with historical input data with the mapped output. The algorithm will learn the patterns within the input data for each output and represent that as a statistical equation, which is also commonly known as a model.
2. Testing or validation: In this phase the performance of the trained model is evaluated, usually by applying it on a dataset (that was not used as part of the training) to predict the class or event.
3. Prediction: Here we apply the trained model to a data set that was not part of either the training or testing. The prediction will be used to drive business decisions.