

# **PRIOR KNOWLEDGE**

## **SUPERVISED LEARNING**

Supervised learning, as the name indicates, has the presence of a supervisor as a teacher. Basically supervised learning is when we teach or train the machine using data that is well labelled. Which means some data is already tagged with the correct answer. After that, the machine is provided with a new set of examples(data) so that the supervised learning algorithm analyses the training data(set of training examples) and produces a correct outcome from labelled data.

## **UNSUPERVISED LEARNING**

Unsupervised learning is the training of a machine using information that is neither classified nor labeled and allowing the algorithm to act on that information without guidance. Here the task of the machine is to group unsorted information according to similarities, patterns, and differences without any prior training of data.

## **REGRESSION CLASSIFICATION AND CLUSTERING**

### **Classification**

Classification is a type of supervised machine learning algorithm. For any given input, the classification algorithms help in the prediction of the class of the output variable. There can be multiple types of classifications like binary

classification, multi-class classification, etc. It depends upon the number of classes in the output variable.

## Clustering

Clustering is a type of unsupervised machine learning algorithm. It is used to group data points having similar characteristics as clusters. Ideally, the data points in the same cluster should exhibit similar properties and the points in different clusters should be as dissimilar as possible.

## ARTIFICIAL NEURAL NETWORKS

The term "Artificial neural network" refers to a biologically inspired sub-field of artificial intelligence modeled after the brain. An Artificial neural network is constructed to mimic the structure of the human brain. Similar to a human brain having neurons interconnected to each other, artificial neural networks also have neurons that are linked to each other in various layers of the networks. These neurons are known as nodes.

## CONVOLUTION NEURAL NETWORKS

A convolutional neural network, or CNN, is a deep learning neural network designed for processing structured arrays of data such as images. Convolutional neural networks are widely used in computer vision and have become the state of the art for many visual applications such as image classification, and have also **found success in natural language processing for text classification.**