PRE-REQUISITES
PRIOR KNOWLEDGE

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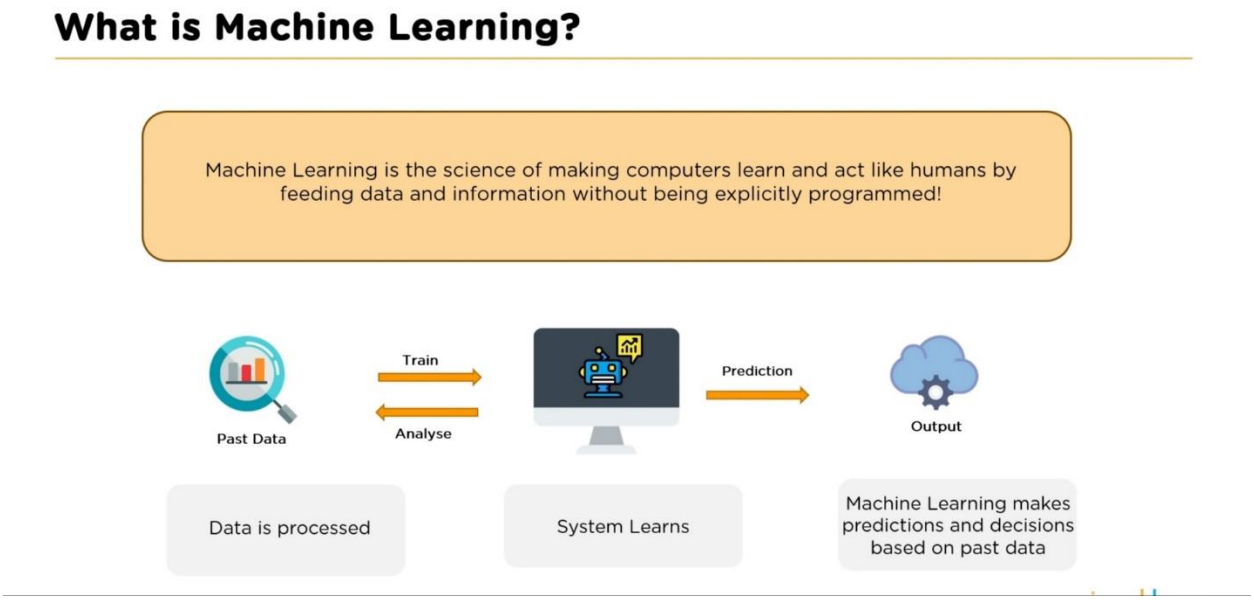
PRIOR KNOWLEDGE

Prior knowledge is defined as all the knowledge one has before learning about a particular topic. A learner's understanding of educational material can be improved by taking advantage of their prior knowledge before dealing with the new material. General understanding about the way students learn states that the success of learning is determined by how much the learner already knows about a given topic or related topics. If the prior knowledge is correct and consistent with the new information being taught, the effect on learning is positive.

MACHINE LEARNING

Machine learning is a subfield of artificial intelligence, which is broadly defined as the capability of a machine to imitate intelligent human behavior. Artificial intelligence systems are used to perform complex tasks in a way that is similar to how humans solve problems.

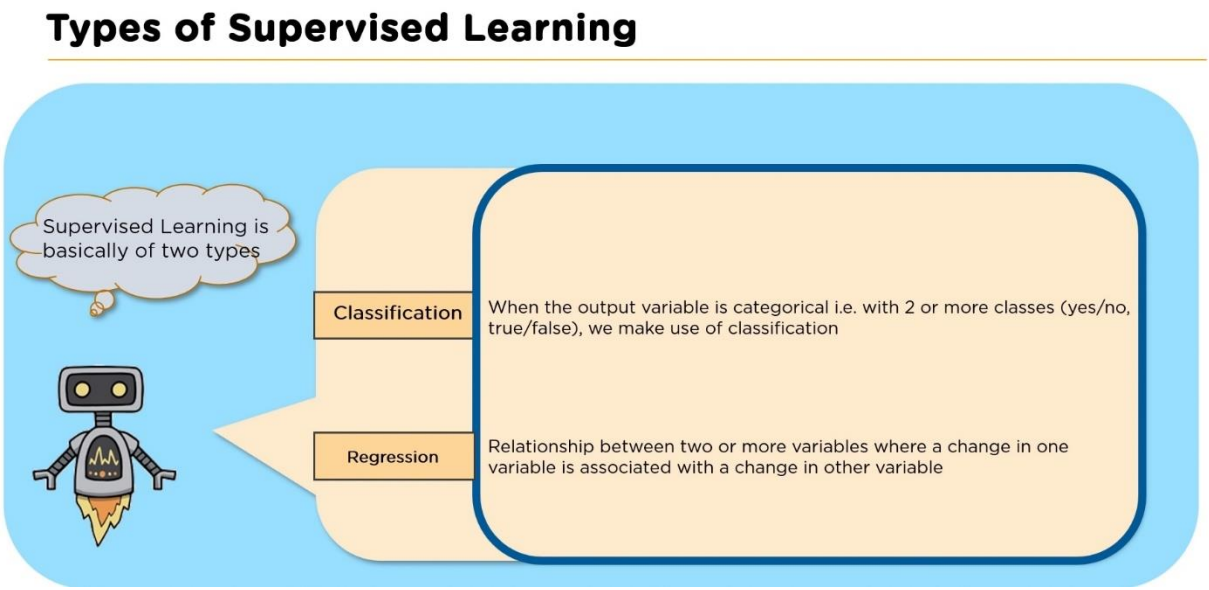


TYPES OF MACHINE LEARNING

- **Supervised Learning**
- **Unsupervised Learning**

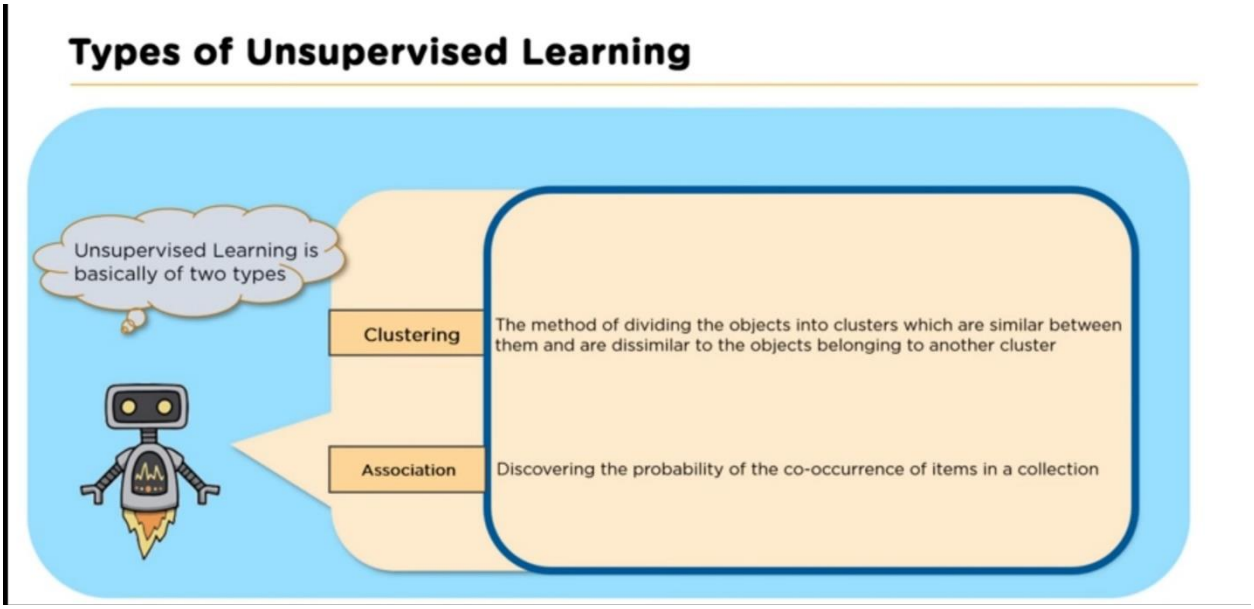
SUPERVISED LEARNING

Supervised learning, also known as supervised machine learning, is a subcategory of machine learning and artificial intelligence. It is defined by its use of labeled datasets to train algorithms that to classify data or predict outcomes accurately. Supervised machine learning is immensely helpful in solving real-world computational problems. The algorithm predicts outcomes for unforeseen data by learning from labeled training data. Therefore, it takes highly- skilled scientists to build and deploy such models. Over time, data scientists also use their technical expertise to rebuild the models to maintain the integrity of the insights given.



UNSUPERVISED LEARNING

Unsupervised learning, also known as unsupervised machine learning, uses machine learning algorithms to analyze and cluster unlabeled datasets. These algorithms discover hidden patterns or data groupings without the need for human intervention. Its ability to discover similarities and differences in information make it the ideal solution for exploratory data analysis, cross- selling strategies, customer segmentation, and image recognition.



In supervised learning, the model learns from a labelled data, whereas, in unsupervised learning, the model trains itself on unlabelled data. Linear regression, logistic regression, support vector machines, and k nearest neighbour are some of the popular supervised learning. K-means clustering and principal component analysis are the two popular unsupervised learning algorithms.

In supervised learning, input data is provided to the model along with the output. In unsupervised learning, only input data is provided to the model. The goal of supervised learning is to train the model so that it can predict the output when it is given new data.

Generally machine learning algorithms are categorized on the basis of output type and type of problem that need to be addressed. So these algorithm are divided into three categories (1) Classification (2) Regression (3) Clustering

CLASSIFICATION

Classification is the type of supervised machine learning. For any given input, the classification algorithm help in the prediction of the class of the output variables. there can be multiple type of classification are - binary classification, multi-class classification

Types of classification

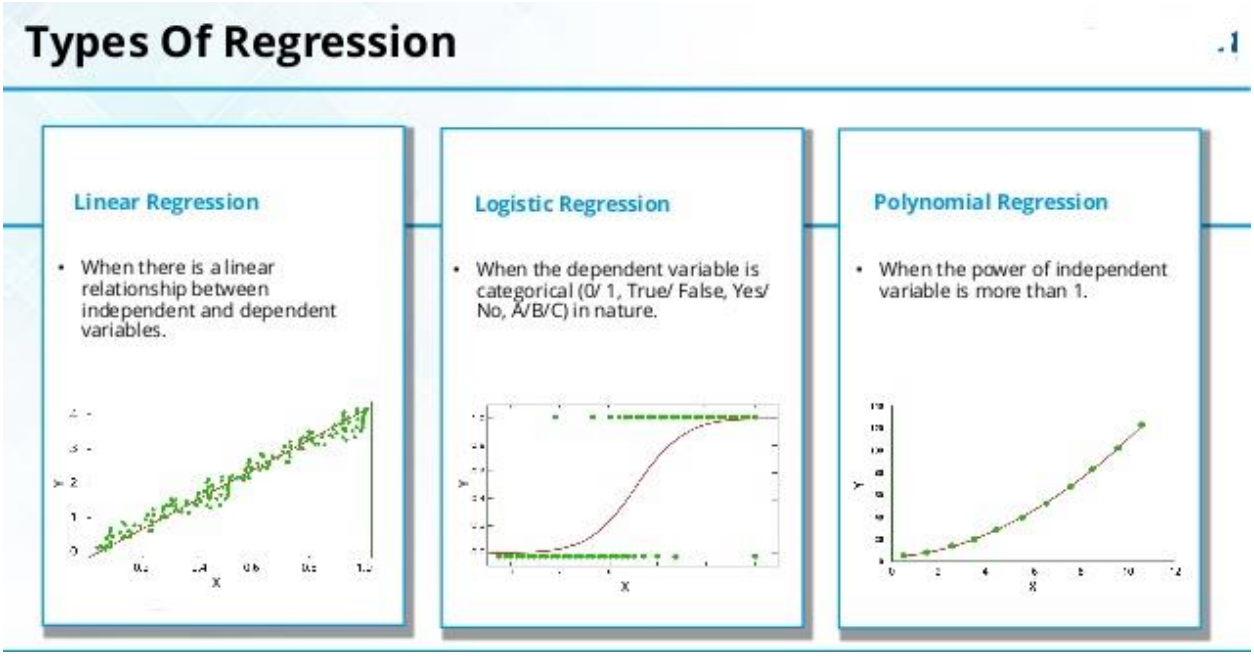
- K-Nearest Neighbour
- Logistic regression Decision tree
- Random forest
- Naive Bayes

REGRESSION

Regression is a technique for investigating the relationship between independent variables or features and a dependent variable or outcome. It's used as a method for predictive modelling in machine learning, in which an algorithm is used to predict continuous outcome. The ultimate goal of the regression algorithm is to plot a best-fit line or a curve between the data. The three main metrics that are used for evaluating the trained regression model are variance, bias and error.

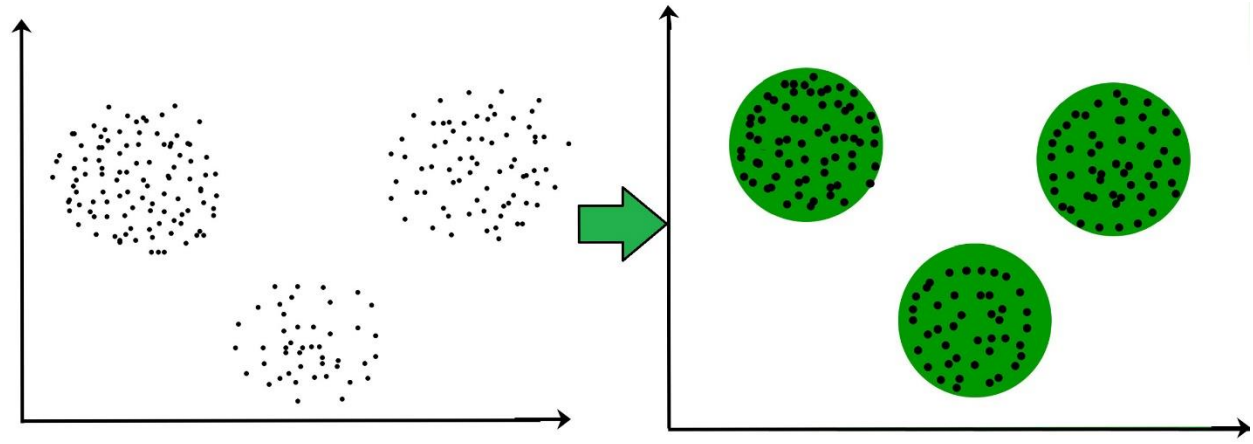
TYPES OF REGRESSION

- Linear Regression.
- Logistic Regression.
- Polynomial Regression.



CLUSTERING

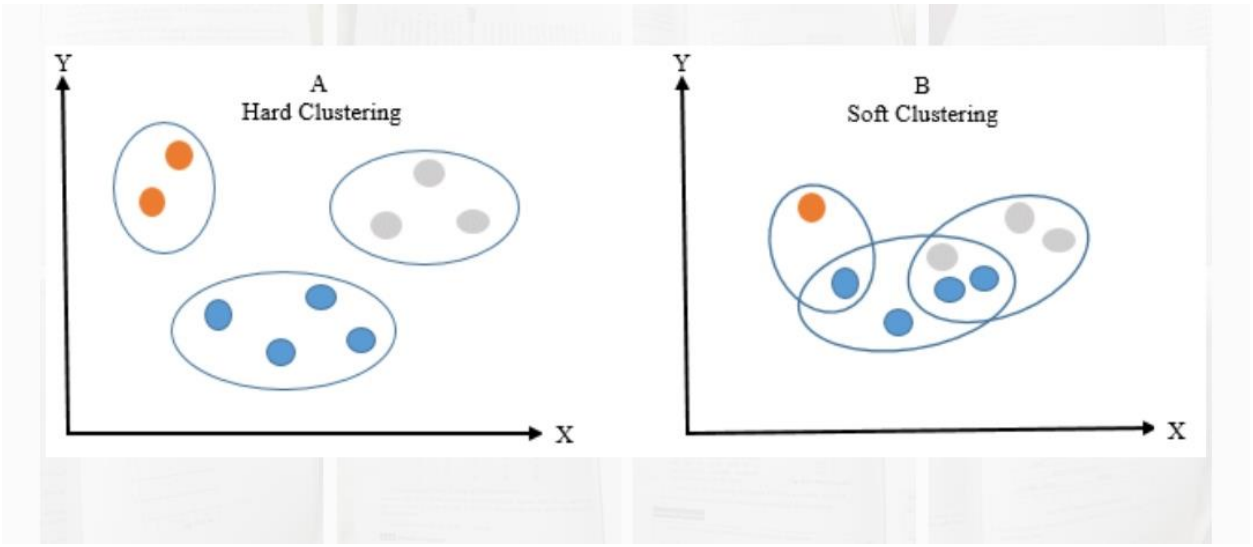
Clustering way of grouping the data points into different clusters, consisting of similar data points. The objects with the possible similarities remain in a group that has less or no similarities with another group (i.e) it is used to group data point having similar characteristics as cluster.



TYPES OF CLUSTER

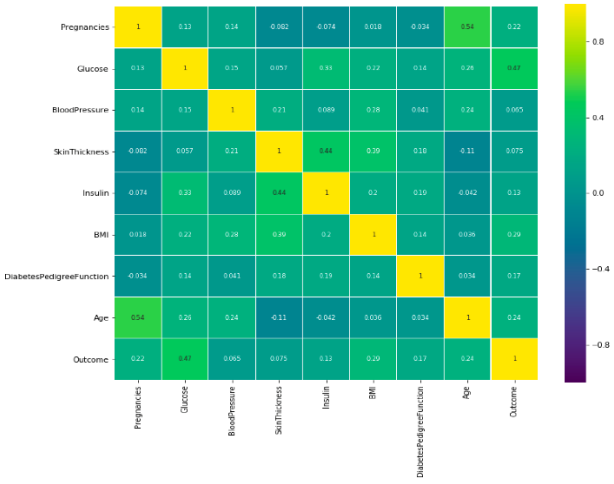
1. Hard clustering - In hard clustering, the data point is assigned to one of the clusters only.

2. Soft clustering - It provides a probability likelihood of a data point to be in each of the clusters.



DATA VISUALIZATION

Data visualization is a way to represent information graphically, highlighting patterns and trends in data and helping the reader to achieve quick insights. By using visual elements like charts, graphs, and maps, data visualization tools provide an accessible way to see and understand trends, outliers, and patterns in data.



FLASK REFERENCE(PYTHON)

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions.