SUPERVISED LEARNING

In Supervised learning we were given dataset that consists of **labels/ output** (**y**), here we have clear idea on what our learning model needs to be predicted.

In this supervised learning, first we need to do the **Feature representation**(**X, y**), that is selecting the required data columns from the given dataset, and we train a learning model to predict the correct output label ***y*** for a given input sample of ***X*** (Which is not seen by our model earlier).

X → input samples, features or independent variables

y → predicted value, target or dependent variable.

Model → It is the scientific representation of the relation between features and target variables.

General model building flow for Supervised Learning:

Supervised Learning is of two types:

Regression → Here our output value is a continuous (floating or real value).

Classification → Here we map our input data samples X, to a discrete value.

- Classification may be binary, multi-class, multi-label.
- Binary → the predicted value is of positive or negative class (Yes/No type).
- Multi-Class → the predicted value is a single value in a subset of discrete values, for example detecting a number(from a set of 0-9).
- Multi-Label → predicting the multi target values, for example classifying web pages into multiple labels.

How different Supervised Learning algorithms learn by estimating their parameters from Data to make predictions.

Regression : Mean Square Error and gradient descent.

What are the strengths and weaknesses of supervised Learning Algorithms?