**Machine Learning Algorithms**

**Logistic Regression** is a supervised machine learning algorithm. It is a process of modelling the probability of an outcome given an input variable. It models a binary outcome; something that can take two values such as yes/no and true/false.

Logistic regression is useful for situations where there could be an ability to predict the presence or absence of a characteristic or outcome, based on values of a set of predictor variables. This type of analysis can help you predict the likelihood of an event. Happening or a choice being made.

**Logistic Regression Examples:**

* Credit card fraud- is of a significant importance to the banking industry because banks spend hundreds of millions of cash each year due to fraud. When a credit card transaction happens, the bank makes a note of several factors. For instance, the amount, place, date of the transaction, type of purchase. Based on these factors, they develop a logistic. Regression model of whether. Or not the transaction is a fraud.

For instance, if the amount is too high and the bank knows that the concerned person never makes purchases that high, the bank may label it as fraud.

* Tumour Prediction- Logistic Regression may be used to identify whether a tumour is malignant or if it is benign. Several medical imaging techniques. Are used to extract various features. Of tumours. For instance, the affected body area or the size of the tumour. These features are fed to a Logistic Regression classifier to identify if the tumour is malignant or benign.

**Linear Regression** is a machine learning algorithm based on supervised learning. It performs a regression task. Regression models a target prediction value based on independent variables. It is mostly used for finding out the relationship between variables (x(input) and y(output)) and forecasting.

There are two main types of linear regression:

* **Simple linear regression:** is where we try to find the relationship between a single independent variable (input) and a corresponding dependent variable (output). It can be express in the form of a straight line. It uses traditional slope-intercept form, where ***l*** and ***b*** are the variables the algorithm will try to learn to produce the most accurate predictions. X represents our input data and y represents our prediction.

**Y= *l x + b***

**Applications of simple Linear Regression include:**

* Marks score by student based on hour studied. Marks scored is. Dependent. And number of hours studied is independent.
* Predicting crop yields based on the amount of rainfall: Yield is dependent variable while the amount of rainfall is independent variable.
* Predicting the salary of a person based on experience: Experience become independent variable while salary becomes the dependent variable.
* **Multi Linear Regression:** is used to estimate the relationship between two or more independent variables(inputs) and one dependent variable(output).

**Advantages of Multi linear regression:**

* It can be used to identify the strength of the effect that the independent variable has on a dependent variable.
* It can be used to forecast the effects or impacts of changes. That is, it can help understand how much the dependent variable change when the independent variables change.