Hello everyone,

Let us continue with out ML series.

Today let us focus on different types of Machine Learning Algorithms, which are more important for structed or labeld dataset.

**Supervised ML Algorithms:**

Whenever our data consists of input and output(Target) variables or it consists of structed labels, we can go for supervised ML algorithms.

This supervised algorithms is further devided in to 2 categories. Those are **Classification** and **Regression**.

Here classification can be further devided in to 2 more categories based on number of predicted output variables.

Those are Binary Classification and Multiclass classification.

**Binary Classification:** Here we are classifiing or predicting the output in only maximum of two variables**.**

**Example**: True or False, Yes or No, 0 or 1 or good or bad , positve or negative like this we can consider many more.

Let us consider the below example to get more clarity.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Student Name** | **Study (Hours)** | **Play (Hours)** | **Sleep (hours)** | **Pass or Fail (Output)** |
| Student 1 | 9 | 3 | 12 | P |
| Student2 | 2 | 8 | 14 | F |
| Student 3 | 8 | 8 | 8 | P |
| Student 4 | 6 | 8 | 10 | P |

**Explanation:** from the above example, the output variableis Pass or Fail. Its always depends on the input variables as number of study hours, number of playing hours and number of sleeping hours.So if spends more time to study there are lot of possibilities to pass else no. Hence here are having only 2 output variables, those are pass or fail. This is best example for binary classification.

**Exercise:** Now we can imagine other examples also. (Please try to think on other real world Binary Classification problem statements. Message me in the chat if possible.)

**Multiclass Classificaiton:** Here we are classifiing or predicting the output in to more than two output variables which we can able to count.

Lets consider the below real time example to get more clarity.

|  |  |  |
| --- | --- | --- |
| Name of the occupation | Income (in lacs per annam) | Output (Rich, Poor or Middle class |
| Farmer | 1. 2 | Poor |
| Farmer with lot of valuable forming lands | 4 -5 | Middle class |
| Jr Engineer | 3-4 | Middle class |
| Software Engineer | 5+ | Rich |

Explanation: From the above example, we can cleary see that, it’s a labeld data. So its comes under Supervised ML also it is having more than 2 output variables (Poor, Middle Class and Rich). So its fall under multiclass classification.

**Exercise:** Now we can imagine other examples also. (Please try to think on other real world Multi Class Classification problem statements. Message me in the chat if possible.)

**Types of Classification Algorithms:**

* Logistic Regression
* Decision Tree classifier
* RandomForest Classifier
* Gradient Boosting Classifier
* AdaBoos Classifier
* XGBoost Classifier
* Support Vector Machine Classifier
* CatBoost Classifier
* LightGBM Classifier
* **Naive Bayes Classifier**

Depending upon our use cases, we can choose any of the classifiers to build the Machine Learning model.

Now lets start discussing about Regression Algorithms:

Regression Algorithms:

Whenever our ourput or target variable is having the continuous values.

Example: **Prediction of House prices based on number of bedrooms, size and location.**

|  |  |  |  |
| --- | --- | --- | --- |
| Number of Bedrooms | House size | Location | Price |
| 4 BHK | 5000 sft | Hyderabad near Metro | 3 cr |
| 3 BHK | 3000 sft | Kompally | 2.5 cr |
| 2 BHK | 1000 sft | Township | 80 Lac |
| 1 BHK | 600sft | New area | 50 lac |
|  |  |  |  |

Explanation: In the given example its very much clear that, price of house is continuously varying depending upon the number of bedrooms, size and location of that house.

**Exercise:** Now we can imagine other examples also please. (Please try to think on other real world Regression problem statements. Message me in the chat if possible).

**Types of Regression Algorithms:**

* Linear Regression
* Decision Tree Regression
* RandomForest Regression
* Gradient Boosting Regression
* AdaBoos Regression
* XGBoost Regression
* Support Vector Machine Regression
* CatBoost Regression
* LightGBM Regression

Here also, depending upon our usecases or problems statements. We can use any those regression algorithms to train our model.