**Complete Data Science Boot Camp**

**Introduction**

**BI with analysis on Past Data:** This tells us what happened

1. Observations obtained from different sources are converted into measures and attributes (categorical data).
2. Measures are quantified into created metrics. Quantification is applied based on certain business rules
3. KPIs are defined from metrics which will be used to create reports/Dashboards

**Predictive analytics:** This prepare us for future

**Traditional methods:**

1. Regression is using a model for quantifying causal relationships
2. Linear:

y=bx

y 🡪 observation/measure/fact

b 🡪coefficient

x 🡪 explanatory variable /regressor/independent variable/predictor variable

1. Logistic regression:

Here Y ranges from 0 to 1. Helps in decision making process.

1. Clustering:

Grouping of observations

1. Factoring:

Grouping of explanatory variable

1. Time series:

Time based plotting. Time always be on horizontal line.

**Machine Learning:**

An ML algorithm is essentially a trial-and-error process. Each consecutive is at least as good as the previous one.

Data 🡪 Model 🡪 Objective Function 🡪 Optimization Algorithm

Data : Different possible verities of data needed to train the model

Model : The core functionality for which we are developing the ML algorithm. Model always have a target

Objective Function : This calculates how far is the implementation of model from the target for each trial with training data set. Basically measure the error percentage.

Optimization Algorithm : It collect findings of Objective Function and implement the mechanics that will improve the performance of the model.

* 1. Supervised Learning: Uses Labelled data. Helps in defining target prior to run. Can have different targets for different groups of data. Basically we used when we knows the categories of data well and so we can define targets prior
     + Support vector machines
     + Neural Networks
     + Deep learning
     + Random forests
     + Bayesian networks
  2. Un Supervised Learning : Data without labels. Target is not defined. Here we are looking for a model that divides the data in a certain way. Used when we don’t know categories of data prior and we need to understand the categories through this learning.
     + K-Means
     + Deep learning
  3. Reinforcement Learning : Here we are introducing a reward system. Objective function here won’t look to minimize the errors but will look for maximizing the accuracy