Traditional Method
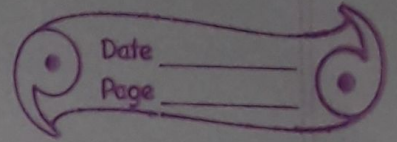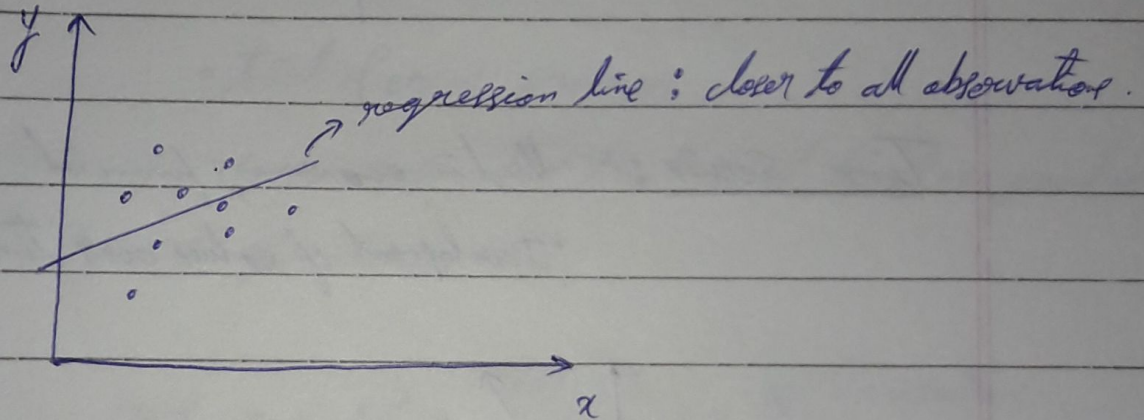
Regression :- A model used for quantifying casual relationships among the different variables included in analysis.
(Linear Regression)

regression line : closer to all observations.

Logistic Regression : Non linear model

Values on vertical line is $1s$ & $0s$ only.

Used in decision making process

Cluster Analysis : When observations are divided into groups/clusters.

$$y = a + b_1 x_1 + b_2 x_2 + \ldots + b_n x_n$$

x : explanatory variable
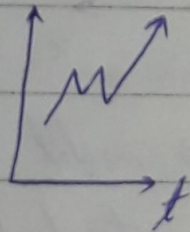
= regressor = independent variable

= predictor variable

Factor Analysis: same as regression but with less dimensions.

cluster Analysis	Factor Analysis
grouping of observation	grouping of variables

Time Series :- • Used in economic, financial
                • Development of values over time

Ex: User Experience (UX) : cluster analysis
     Sales Forecasting   : time series.

ML

ML: Creating an algo, which a computer then uses to find a model that fits the data as best as possible. And makes very accurate predictions based on that.

- trial & error process
- each consecutive trial is at least as good as the previous one.

$$Data \rightarrow Model \rightarrow \text{objective Function} \rightarrow \text{Optimization Algo}$$

- No rules or instructions. Only goal.
- training stops after certain accuracy / trials.

Types of ML:

(a) **Supervised Learning:** • training an algo resembles a teacher supervising a student.

labelled data: labelling the goal.

accuracy of each try can be accessed.

(b) Unsupervised Learning:- Unlabelled data.

        • no prior info about target

(c) Reinforcement Learning :- • a reward system

        Better ? reward } Positive Reinforcement
        Worse ? None }

SVMs = Support Vector Machines
NNs = Neural Networks

    Deep Learning :- • fundamentally different
                • broad practical scope (high accuracy)
               ↳ supervised, unsupervised & reinforcement