SNS College of Technology

Coimbatore - 35

19BAZ782 – Analytics for Everyone

Unit IV – Predictive Analytics I

Topic...Guess...???

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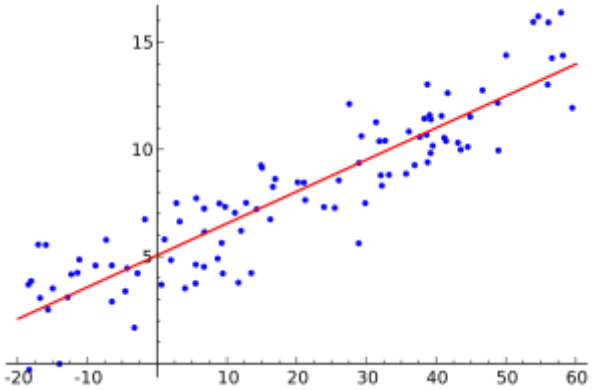
1st Indian Institution to Implement Design Thinking Curriculum

Redesigning Common Mind and Business Towards Excellence

Recall

- Exponential Smoothing
- Concepts and its types
- Problem on Single Exponential Smoothing

Guess the topic...???



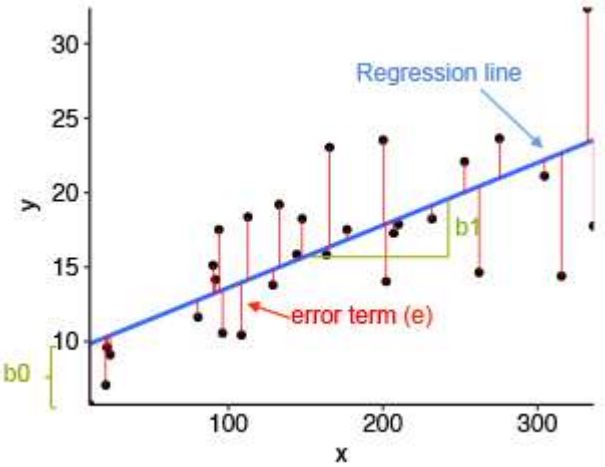
Linear Regression: Single Variable

$$\hat{y} = \beta_0 + \beta_1 x + \epsilon$$

Predicted output — Coefficients — Input — Error

Linear Regression: Multiple Variables

$$\hat{y} = \beta_0 + \beta_1 x_1 + \ldots + \beta_p x_p + \epsilon$$



Torturing the data

Hypothesis

- Good looking couples are most likely to have girl child
- Women use camera phone than men
- Smokers are aggressive in sales
- Left handed earn more money

Regression

- To find the existence of association between dependent variable [Y] and independent variable [X1, X2…]
- Math vs Stat
- Dependent variable or response variable
- Independent variable or explanatory variable
- No Causation

$$Y = \beta_0 + \beta_1 X$$

$$Y = \beta_0 + \beta_1 X + \in$$

Regression Nomenclature

Dependent Variable	Independent variable
Explained variable	Explanatory Variable
Regressand	Regressor
Predictand	Predictor
Endogenous Variable	Exogenous Variable
Controlled Variable	Control Variable
Target Variable	Stimulus Variable
Response Variable	

Importance

- Finance: CAPM, NPA, Profitability, Chance of Bankruptcy, Credit Risk
- Marketing: Sales, Market Share, Customer Satisfaction, Churn, Retention
- Operations: Inventory, Production, Efficiency
- HR: Man Power, Training, Attrition, Job Satisfaction

Types

- Simple and Multiple
- Linear and Non Linear

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

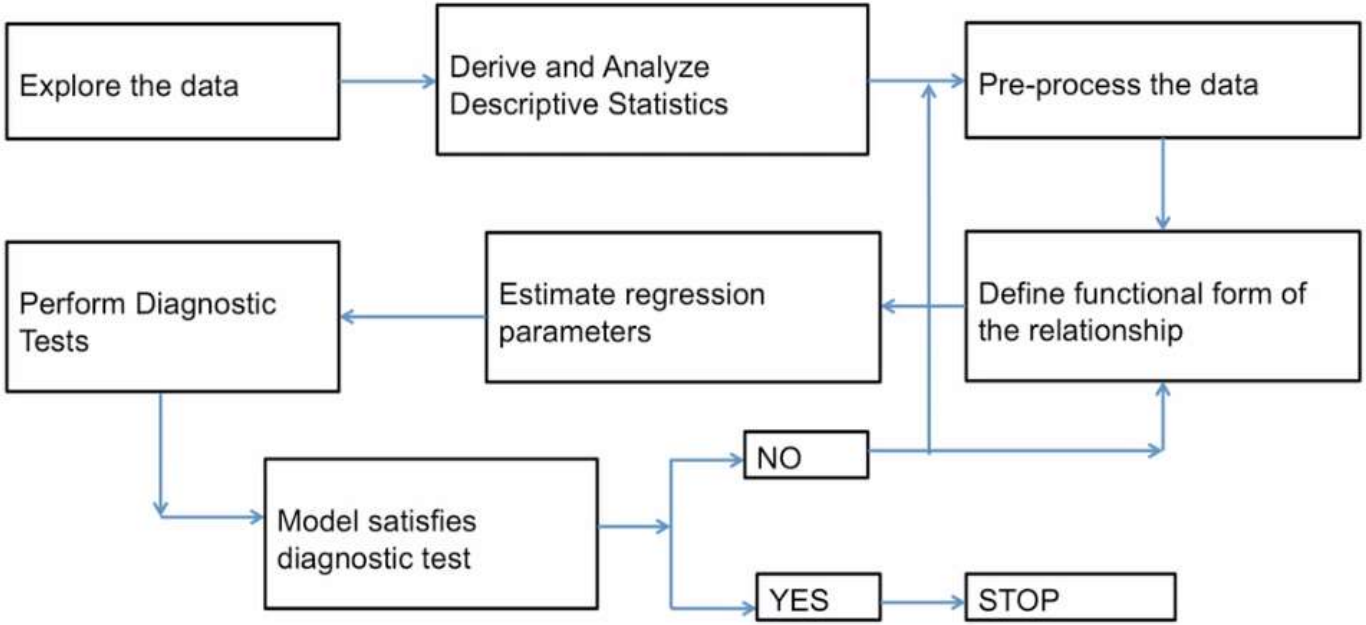
$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + \varepsilon$$

$$Y = \beta_0 + \frac{1}{\beta_1 + \beta_2 X_1} + X_2^{\beta_3} + \varepsilon$$

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k + \varepsilon$$

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_1 x_2 + \beta_4 x_2^2 \ldots + \beta_k x_k + \varepsilon$$

Regression Model Deployment



Summary

- Concept of regression
- Regression equation
- Importance
- Types of variables
- Model deployment

Reference

- https://www.statisticshowto.com/probability-and-statistics/regression-analysis/
- https://statisticsbyjim.com/regression/choosing-regression-analysis/
- https://towardsdatascience.com/5-types-of-regression-and-their-properties-c5e1fa12d55e

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