**Advanced Statistical Analytics Course in R**

1. Descriptive Statistics
   1. Types of Variable
   2. Measure of Central Tendency
   3. Measure of dispersion
   4. Measure of shape
2. Inferential Statistics
   1. Sampling
   2. probability distributions
   3. Type 1 & Type 2 error
   4. p-value/test value
   5. confidence interval
   6. Central Limit Theorem
3. Hypothesis testing
   1. Z-test
   2. t-test
   3. F-test
   4. chi Square tests
4. Simple Linear Regression
5. Correlation
6. Interpretation of regression coefficients
7. Normalization and Scaling
8. Residual Analysis
9. Multicollinearity
10. Outliers
11. Logistic regression
    1. Why logistic
    2. Interpretation
    3. Precision
    4. Recall
    5. Accuracy
12. Clustering
    1. K-means
    2. Hierarchical Clustering
    3. Statistics used for clustering
13. Association Rule Mining
14. Decision Trees
    1. Gini Index
    2. Information Gain
    3. Classification
    4. Regression
    5. Interpretation
15. Forecasting
    1. Moving Average
    2. Exponential smoothing
    3. Trend Analysis
    4. Seasonal Analysis
    5. ARIMA

Case Study

1. Loan Prediction

Problem: Company wants to automate the loan eligibility process (real time) based on customer detail provided while filling online application form. These details are Gender, Marital Status, Education, Number of Dependents, Income, Loan Amount, Credit History and others. To automate this process, they have given a problem to identify the customers segments, those are eligible for loan amount so that they can specifically target these customers.

1. Big Mart Sales Prediction

Problem: The data scientists at BigMart have collected 2013 sales data for 1559 products across 10 stores in different cities. Also, certain attributes of each product and store have been defined. The aim is to build a predictive model and find out the sales of each product at a particular store.

1. Predict survival on the Titanic