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The Advanced Predictive Modelling in R Certification Training course provides an overview of the predictive modeling techniques and their core principles. The course covers the models used in solving predictive analytics problems such as auto-regressive integrated moving average, multiple linear regression, decision trees and logistic regression. The course introduces delegates to the Advanced Statistical and Analytical techniques. The course is beneficial for those professionals who want to enhance their productivity and upgrade their credentials to become an asset to the company.

This contemporary course helps the delegates in improving their company image, encourage employee commitment and generate client confidence. This further ensures promotion, raises and job retention. The course provides essential skills required to become a successful data analyst. During the course, the delegates will gain an understanding of basic regression, multiple regression, neural network, logistic regression, linear regression and survival analysis.

## Prerequisites

The delegates must have a basic understanding of R before attending the Advanced Predictive Modelling in R Certification training course.

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## Course Objectives

Upon the successful completion of the Advanced Predictive Modelling in R Certification Training course, the delegates will be able to:

- Get insights into the Basics of Statistics using R
- Discuss Simple and Multiple Regression
- Understand the concept of Heteroscedasticity
- Describe Dimensionality Reduction
- Understand Advanced and Logistic Regression
- Explain Regression and Imputation
- Understand Neural Networks
- Use Linear Regression to perform model fitting
- Explain Linear Probability Model and Binary Response Variable
- Understand Survival Analysis
- Understand the Dimensionality Reduction Algorithms
- Discuss Forecasting

## Basic Statistics in R

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- Covariance & Correlation
- Central Limit Theorem
- Z Score
- Normal Distributions
- Hypothesis

## Ordinary Least Square Regression 1

This module explains how to present the basic regression and multiple regression graphically.

- Bivariate Data
- Quantifying Association
- Least Squares Method
- The Regressions
- Simple Linear Regression
- Deletion Diagnostics
- Influential Observations
- Regularization

## Ordinary Least Square Regression 2

In this module, the delegates will learn about linear regression and check for Heteroscedasticity.

- Collinearity
- Using Linear Regression, Model fitting
- Performing Under Fitting and Over Fitting
- What is Heteroscedasticity?

## Logistic Regression

This module introduces delegates to Linear Probability Model and logistic regression.

- Understand Binary Response Regression Model
- Logistic Function
- Logistic Curve
- Linear regression as Linear Probability Model
- Goodness of fit matrix
- Linear Probability Model drawback
- All Interactions Logistic Regression
- Multinomial Logit
- Interpretation
- Ordered Categorical Variable

## Advanced Regression

This module covers logistic regression in detail and explains how logistic regression used on the various dataset.

- Poisson Regression
- Model Fit Test
- Offset Regression
- Negative Binomial
- Dual Models
- Hurdle Models

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- Poisson Regression Parameter Estimates
- Zero-Inflated Negative Binomial

## Imputation

In this module, the delegates will learn about addressing missing values.

- Why is Missing Data a Problem?
- Missing Values are Common
- Types of Missing Values
- Problems with Pairwise Deletion
- No Treatment Option
    - Complete Case Method
    - Available Case Method
- Mean Substitution Method
- Imputation
- Regression Substitution Method
- K-Nearest Neighbour Approach
- Maximum Likelihood Estimation
- EM Algorithm
- Little's Test for MCAR
- Single and Multiple Imputation

## Forecasting 1

This module explains forecasting and time series data.

- Need for Forecasting
- Types of Forecast
- Forecasting Steps
- Autocorrelation
- Correlogram
- Time Series Components
- Variations in Time Series
- Seasonality
- Forecast Error
- Mean Error (ME)
- MPE and MAPE---Unit free measure
- Difference between Additive and Multiplicative Seasonality
- Curve Fitting
- Simple Exponential Smoothing
- Decomposition with R
- Generating Forecasts
- Explicit Modeling
- Modeling of Trend
- Seasonal Components
- Smoothing Methods
- ARIMA Model-building

## Forecasting 2

This module covers Seasonality and Trend Analysis.

- Analysis of Log-transformed Data

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- Box-Cox Transformation
- Box-Tidwell Transformation
- Growth Curves
- Logistic Regression: Binary
- Neural Network
- Network Architectures
- Neural Network Mathematics

## Dimensionality Reduction

The module introduces delegates to the Dimensionality Reduction.

- Factor Analysis
- Principal Component Analysis
- Mechanism of finding PCA
- Linear Discriminant Analysis
- Use LDA for determining the maximum separable line
- Implement Dimensionality Reduction algorithm in R

## Survival Analysis

This module covers Churn analysis and Regression.

- Time-to-Event Data
- Censoring
- Survival Analysis
- Types of Censoring
- Survival Analysis Techniques
- PreProcessing
- Elastic Net

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