Methodology: Self-pace learning. All learning is presented using animated lessons, quizzes, and hands-on exercises to help you easily learn, apply statistics and how to use Minitab Statistical Software.

Medium: Web-based. Internet connection is required.

Duration: 10 Hours

This learning path expands your analytics skillset by analysing patterns found in historical data to gain better insights, identify potential risks, seek out improvement opportunities, and make predictions about the future. You will explore supervised machine learning techniques for discovering relationships for both continuous and categorical key performance indicators. Specifically, discover the fundamentals of important visualization and statistical concepts such as scatterplots, correlation, regression, binary logistic regression, CART® Classification, CART® Regression, Random Forest® Classification, TreeNet® Regression and MARS® Regression.

Prerequisite: Foundations of Data Analysis

Course – Correlation and Regression

Learning Objectives:

- Identify and characterize relationships between variables and use the relationships to predict the outcomes of business decisions.
- Use scatterplots and correlation to visualize and quantify the strength and nature or relationships between numeric variables.
- Use regression to define linear relationships between numeric variables mathematically, producing equations to predict one value from another.

Section: Relationship Between Two Quantitative Variables

- Basic Concept
- Scatterplot
- Correlation
- Quiz: Relationship Between Two Quantitative Variables
- Minitab Tools: Scatterplot
- Minitab Tools: Correlation
- Exercise: Scatterplots and Correlation

Section: Simple Regression

- Basic Concepts
- Regression
- Hypothesis Tests and R-sq

- Assumptions and Residual Plots
- Quiz: Simple Regression
- Minitab Tools: Simple Linear Regression
- Exercise Simple Regression
- File Download: Trend Analysis in Time Series

Course – Multiple Regression

Learning Objectives:

- Use a matrix plot to visualize the nature of relationships between numeric variables.
- Use correlation to quantify the strength of linear relationships.
- Use multiple linear regression to model a continuous response variable.
- Learn how to assess model accuracy and check model assumptions.
- Use stepwise and best subsets regression to select a model.
- Use binary logistic regression to model a categorical response variable

Section: Relationship Between Multiple Quantitative Variables

- Primer: Missing Data
- Basic Concept
- Matrix Plot and Correlation
- Quiz: Relationship Between Variables
- Minitab Tools: Matrix Plot
- Minitab Tools: Multiple Correlation

Section: Multiple Regression

- Basic Concepts
- Multiple Regression Models
- Assumptions and Residual Plots
- Prediction
- Quiz: Multiple Regression
- Minitab Tools: Fit Regression
- Exercise: Multiple Regression

Section: Polynomial and Interacting Terms

- Polynomial Terms
- Interaction Terms
- Quiz: Polynomial and Interaction Terms
- Minitab Tools: Fit Regression Model with Polynomial
- Minitab Tools: Fit Regression Model with Interaction
- Exercise: Polynomial and Interaction Terms

Section: Model Selection

- Stepwise Regression
- Best Subsets Regression
- Quiz: Model Selection
- Minitab Tools: Fit Regression Model with Stepwise
- Minitab Tools: Best Subsets Regression
- Exercise: Model Selection

Section: Binary Logistic Regression

- Basic Concepts
- Model Fitting and Diagnostics
- Model Visualization and Prediction
- Quiz: Binary Logistic Regression
- Minitab Tools: Fit Binary Logistic Regression Model
- Exercise: Binary Logistic Model

Course – Predictive Analytics

Learning Objectives:

- Learn what is meant by predictive analytics.
- Understand the fundamentals of machine learning.
- Learn how to use validation to assess models.
- Understand the basic concepts of regression trees.
- Use a CART classification tree to model a categorical response or target variable.
- Use a CART regression tree to model a continuous response or target variable.
- Use a Random Forest Classification to model a categorical response or target variable.
- Use a TreeNet Regression to model a continuous response or target variable.

Section: Predictive Analytics

- Basic Concepts
- Machine Learning
- Quiz: Overview of Predictive Analytics

Section: Model Validation

- Basic Concepts
- Validation Techniques
- Quiz: Validation Techniques
- Minitab Tools: Fit Regression Model with Validation

Section: Tree Based Model
- Basic Concepts
- Using Decision Trees
- Quiz: Tree-Based Methods

Section: CART Classification Trees
- Primer: CART Classification Splitting
- Fitting a CART Classification Tree
- Model Summary Statistics
- Using the CART Classification Tree Results
- Prediction with CART Classification Trees
- Quiz: CART Classification Trees
- Minitab Tools: CART Classification
- Exercise: CART Classification

Section: CART Regression Trees
- Primer: CART Regression Splitting
- Fitting a CART Regression Tree
- Using the CART Regression Tree Results
- Prediction with CART Regression Trees
- Quiz: CART Regression Trees
- Minitab Tools: CART Regression and Prediction
- Exercise: CART Regression

Section: MARS Regression
- Basic Concepts
- Knots
- Basis Functions and Knots
- Fitting a MARS Model
- Using MARS Model Results
- Prediction with a MARS Model
- Quiz: MARS Regression
- Minitab Tools: MARS Regression
- Exercise: MARS Regression

Section: Random Forests Classification
- Primer: Random Forests Classification
- Bootstrap Sampling
- Basic Concepts
- Out-of-Bag Validation
- Fitting a Random Forests Model
- Using Random Forests Model Results
- Prediction with a Random Forests Model

- Quiz: Random Forests Classification
- Minitab Tools: Random Forests Classification
- Exercise: Random Forest Classification

Section: TreeNet Regression

- Primer: TreeNet Regression
- Basic Concepts
- Fitting a TreeNet Regression Model
- Using TreeNet Model Results
- Prediction with a TreeNet Regression Model
- Quiz: TreeNet Regression
- Minitab Tools: TreeNet Regression
- Exercise: TreeNet Regression