

Course Title: Machine Learning using R

Duration: 42 hours

Prerequisites:

1. Sound understanding of Linear Algebra, concept of derivative
2. Exposure to computer programming.

Module – 1: Machine learning overview

- Brief history of machine learning.
- Importance of Machine learning.
- Machine learning applications – an overview.
- The AI aspect of machine learning.

Module – 2: Commands and syntax of R, for ML

- Installation of R and various packages
- Data handling in R. Loops & blocks in R.
- Graph & visualization overview
- Important packages and functions for machine learning related programming.
- Hands-on examples

Module – 3: Different supervised learning algorithms

- Linear regression & Logistic regression
 - Assignment
- Decision Tree, Random forest
 - Assignment
- Neural Network
 - Assignment
- Support Vector Machine
 - Assignment
- Additional discussion on Optimization, Regularization, feature Normalization
- Understanding the process to analyze performance of various algorithms & improvement techniques.
- Practical examples

Module – 4: Different unsupervised learning algorithms

- K-means clustering
 - Assignment
- Principal Component Analysis
 - Assignment
- Anomaly Detection
 - Assignment
- Practical examples

Module – 5: Brief overview of Reinforcement learning & Deep Learning

- Brief overview of Reinforcement Learning.
- Brief overview of Deep Learning.

Module – 6: Demo application building using ML concept

- Identification of spot on image using machine learning.

Module – 7: Commands and syntax of Python, for ML

- Overview of Python.
- Basic commands, syntax and programming using Python