PIT6J008 MACHINE LEARNING

Module I:

Introduction: well-posed learning problems, designing a learning system, perspectives and issues in machine learning, concept learning and the general-to-specific ordering: Introduction, Concept learning task, concept learning as search, Find-S: finding a maximally specific hypothesis, version spaces and the candidate-elimination algorithm, remarks on version spaces and candidate-elimination, inductive bias. Decision tree learning: Introduction, Decision tree representation, appropriate problems for decision tree learning, the basic decision tree algorithm, hypothesis space search in decision tree learning, inductive bias in decision tree learning, issues in decision tree learning.

Module II:

Artificial Neural Networks: Introduction, Biological motivation, ANN representation, appropriate problem for ANN learning, Perceptron, multilayer networks and the backpropagation algorithm, remarks on the backpropagation algorithm, Linear Models for Regression, Support Vector Machine, Kernel function and Kernel SVM.

Module-III:

Probability and Bayesian learning: Introduction, Bayes Theorem, Bayes theorem and concept Learning, maximum likelihood and least-squared error hypotheses, Bayes optimal classifier, Gibbs Algorithm, Naïve Bayes Classifier, example to illustrate Naïve Bayes classifier. Instance-Based Learning: Introduction, K-Nearest Neighbor Learning, Radial Basis Functions.

Module-IV:

Clustering: k-means, adaptive hierarchical clustering, Gaussian mixture model, theCurse of Dimensionality - Dimensionality Reduction - Factor analysis - Principal Component Analysis

TEXT BOOK

1. Machine Learning. Tom Mitchell. First Edition, McGraw- Hill, 1997.

REFERENCE BOOKS

1. Introduction to Machine Learning Edition 2, by EthemAlpaydin
2. Kevin P. Murphy, "Machine Learning: A Probabilistic Perspective", MIT Press, 2012.
3. Christopher Bishop, "Pattern Recognition and Machine Learning" Springer, 2007.