# 19CS41P1 - MACHINE LEARNING LABORATORY

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| **Course Category** | Professional Core | **Credits** | 1.5 |
| **Course Type** | Practical | **Lecture – Tutorial – Practical** | 0-0-3 |
| **Prerequisite:** | Basic knowledge in DBMS and preliminary fundamentals of data mining algorithms. | **Sessional Evaluation**  **Univ. Exam Evaluation**  **Total Marks** | 40  60  100 |
| **Objectives** | * To study various machine learning models for building applications. | | |
| **Course Outcomes** | At the end of this lab session, the students will be able to identify and understand various machine learning algorithms to develop applications using either Python or JAVA. | | |
| **Course Content** | 1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file. | | |
| 1. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples. | | |
| 1. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample. | | |
| 1. Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets. | | |
| 1. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test data sets. | | |
| 1. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set. | | |
| 1. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API. | | |
| 1. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using *k*-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program. | | |
| 1. Write a program to implement *k*-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem. | | |
| 1. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs. | | |
| **Text Books and References:** | 1. Tom M. Mitchell, Machine Learning**,** India Edition 2013, McGraw Hill Education. 2. EthemAlpaydın, Introduction to machine learning, second edition, MIT press. | | |