Machine Learning Lab(CS-451)

Course Objectives:

1. Demonstrate the basic concepts and techniques of Machine Learning.

2. Develop skills of using recent machine learning software for solving practical problems.

3. Provide experience of doing independent study and research.

Course Outcomes:

1. Implement supervised learning techniques.

2. Write programs to solve problems using reinforcement learning.

3. Develop solutions to the problems usingunsupervised learning.

List of Programs:

1. Implement and demonstrate the FIND-S algorithm to finding the most specific hypothesis based on a given set of data samples. Read the training data from a .CSV file.

2. 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.

3. 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.

4. Assuming a set of documents that need to be classified, use the naïve Bayesian classifier model to perform this task. Built-in classes /API can be used to write the program. Calculate the accuracy precision and recall for your data set.

5. Write a program to construct a Bayesian network considering medical data. Use this model to demonstrate the diagnosis the of heart patients using standard heart disease data set. You can use Python ML Library classes /API.

6. 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.

7. Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets.

8. 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 Python ML library classes/API in the program.

9. Write a program to implement k-Nearest Neighbor algorithm to classify the iris data set. Print both correct and wrong predictions. Python ML library classes can be used for this problem.

10. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set your experiment and draw graphs.