

# MACHINE LEARNING USING PYTHON LAB

III Year B. Tech CSE (AI & ML) I Sem.

Course Code: A2255A6

## Course Outcomes:

At the end of the course the student should be able to:

1. Select data, model selection, model complexity and identify the trends.
2. Understand a range of machine learning algorithms along with their strengths and weaknesses.
3. Build predictive models from data and analyze their performance.

## List of Experiments

### WEEK 1 :

- a) Write a program using scikit-learn to implement K-means Clustering
- b) Program to calculate the entropy and the information gain
- c) Program to implement perceptron.

### WEEK 2:

- 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.

### WEEK 3:

- 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.

### WEEK 4:

- 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.

### WEEK 5:

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

**WEEK 6:**

- 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.

**WEEK 7:**

- 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.

**WEEK 8:**

- Write a program to implement k-Nearest Neighbors algorithm to classify the iris data set. Print both correct and wrong predictions.

**WEEK 9:**

- Write a program to implement SVM algorithm to classify the iris data set. Print both correct and wrong predictions.

**WEEK 10:**

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