**ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING LABORATORY**
**(Effective from the academic year 2018 -2019)**
**SEMESTER – VII**

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| **Course Code** | **18CSL76** | **CIE Marks** | 40 |
| **Number of Contact Hours/Week** | 0:0:2 | **SEE Marks** | 60 |
| **Total Number of Lab Contact Hours** | 36 | **Exam Hours** | 03 |

**Credits – 2**

**Course Learning Objectives:** This course (18CSL76) will enable students to:

- Implement and evaluate AI and ML algorithms in and Python programming language.

**Descriptions (if any):**

**Installation procedure of the required software must be demonstrated, carried out in groups and documented in the journal.**

**Programs List:**

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|---|---|
| 1. | Implement A* Search algorithm. |
| 2. | Implement AO* Search algorithm. |
| 3. | For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithmto output a description of the set of all hypotheses consistent with the training examples. |
| 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 toclassify a new sample. |
| 5. | Build an Artificial Neural Network by implementing the Backpropagation algorithm and test the same using appropriate data sets. |
| 6. | 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. |
| 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. You can add Java/Python ML library classes/API in the program. |
| 8. | 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. |
| 9. | Implement the non-parametric Locally Weighted Regressionalgorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs |

**Laboratory Outcomes**: The student should be able to:

- Implement and demonstrate AI and ML algorithms.
- Evaluate different algorithms.

**Conduct of Practical Examination:**

- Experiment distribution
  - For laboratories having only one part: Students are allowed to pick one experiment from the lot with equal opportunity.
  - For laboratories having PART A and PART B: Students are allowed to pick one experiment from PART A and one experiment from PART B, with equal opportunity.
- Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.
- Marks Distribution *(Courseed to change in accoradance with university regulations)*
  - q) For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15 = 100 Marks
  - r) For laboratories having PART A and PART B
    - i. Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks
    - ii. Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks