

## Nitte Meenakshi Institute of Technology,

Department of Computer Science and Engineering

### 18CSE751 – Introduction to Machine Learning

#### Learning Activity (LA)

#### Laboratory Based Exercises

1. Threaded Exercises to solve a real-world problem (chosen by you) using the following machine learning methods learnt as a part of *Introduction to Machine Learning* course
  - a. Perceptron
  - b. Neural Networks (MLP, Gradient variants, different activation functions etc.,)
  - c. Bayesian classifiers(Naïve, optimal and BBF)
  - d. Decision Tree Classifiers (CART, ID3, C4.5 etc.,)
  - e. KNN (simple, weighted)
  - f. SVM & Multi-Class Classification
  - g. Clustering (K-Means, Hierarchical etc.,)
2. Implement GPU computing (if required and possible) to solve the problem chosen in 1.

#### Overview

The goals of this learning activity are

- Apply machine learning algorithms (in python) for a real-world problem with the necessary dataset chosen (*Refer sources like: Kaggle, kdnuggets, UCI etc*).
- As a team of 2/3 members, you can discuss your findings on the chosen questions and consolidate your learnings as a report (Answers to each question: Algorithm, Working screen shots and results, Comparison and Analysis).
- Make a consolidated report about your findings
- This learning activity is an important part of the course and counts for 20% of your final grade. Grades will be based on the problem chosen, machine learning approaches, used, completeness of your findings, analysis, quality of the proposal and report.

#### Grading

- This learning activity is worth for 20 marks
- Marking Scheme with timelines

Document	Weightage	Due Date	Comments
LA Proposal	5	20-Dec-2021	Refer <a href="#">proposal</a>
LA Report	10	17-Jan-2022	Refer <a href="#">report</a>
LA Presentation	5	18-Jan-2022(onwards)	

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- Proposal Submission: 20-Dec-2021
- Final Report Submission and Presentation: 17-Jan-2022
- Late delivery without prior notification and permission from the instructor will result in a loss of 10% of the marks per day.

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## **Learning Activity Proposal**

**Due 20-Dec-2021 11:55 pm**

**Title of Proposal**

**Member 1, Member 2, (and Member 3)**

### **Abstract**

The abstract should be one paragraph that summarizes what will you do in your learning activity

### **Introduction**

Provide a brief overview of machine learning. Describe what your proposal is about and the organization of the rest of the proposal. Include the machine learning methods that will be used to solve the identified problem and questions set with necessary reasoning (or another data mining tool),

### **Data Set**

Describe the data set(s) you will be using in your project. Include the origin of the data set, an overview of the data set organization, attributes of the data, and challenges of the data set you've selected. Include any information you have about missing values in the data set.

### **Machine Learning Methods**

Provide the specific machine learning methods that you will apply on the chosen dataset. Include specific questions you will investigate, and the goals aimed to accomplish.

### **Assessment**

Discuss the assessment methodology you will use to validate the models.

### **Presentation and Visualization**

Describe how your results will be presented and visualized

### **Roles**

In this section, discuss the roles that each group member will have in the project.

### **Schedule**

The schedule is a table of dates and tasks that you plan to complete.

**Date**

**Tasks to be Completed**

??/??/21

Tasks completed by chosen date

??/??/22

Tasks to be completed by the final report/ presentation date

### **Bibliography**

This is where you list bibliographic information for any references you made throughout the proposal.

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## **Learning Activity Report**

**Due 17-Jan-2021 11:55 pm**

Report Size: Should be 15 – 20 pages- including tables and figures, single spaced font size 12.

### Contents

1. Abstract
2. Contents Page
3. Introduction
  - 3.1. Motivation
  - 3.2. Problem Domain
  - 3.3. Aim and Objectives
4. Data Source and Data Quality
5. Data Pre-processing
6. Machine Learning Methods
7. Results and Discussions
8. Conclusion & Future Directions
9. Lessons learnt
10. References
11. Appendix – Link to the dataset chosen
  - 11.1.1. Python Codes Implemented
  - 11.1.2. Setup to execute the code (if required)