HUMBER

Graduate Certificate in Artificial Intelligence with Machine Learning
AIGC 5002 - Machine Learning and Deep Learning

Assignment 2 (ML Problem Solving)
Course Weight (10%)

Due Date: 11:59 PM December 4th, 2024

Group Assignment: This assignment must be done in groups. The group should be your capstone project group. The final grade will depend on a demo the entire team gives during lab 12 of the course. Each member is expected to understand every part of the assignment, and all members will be asked questions to demonstrate their understanding.

Submission guidelines:

- For this assignemnt, you will need to submit 1 PDF file and 1 Jupyter Notebook **(The assignment code only. No report is required).**
- At the top of the files include the names of all group members.
- Each student should submit their group code on their own blackboard.
- Go to the course Blackboard → Assignments folder → Assignment 2 and submit the pdf.

Before you start your work. Please visit the "Assignment 2 Problems" discussion board on Blackboard. This document will show the problems selected by your classmates. Select a machine-learning problem that does not appear in the list. Write a brief description of the problem you chose in that document. This will ensure that no two groups are working on the same problem.

Assignment Steps

1. In this assignment, you are tasked with defining a problem in a field of your choice where machine learning can be used as a solution for. (Make sure you follow the ML pipeline we discussed in the course)
2. In your Jupyter notebook, in a markdown cell, clearly explain the problem you chose, its importance, and why machine learning can be used to solve it.

3. Find a dataset that you can use for training your machine learning model. Carry the necessary data pre-processing steps. Describe your dataset and each data pre-processing operation you implemented in your Jupyter notebook.
4. Choose two suitable machine learning algorithms. Justify your choices.
5. Build, train, and then evaluate those models using relevant metrics and visualizations. (You do not need to do any ML Hyperparameter Optimization)
6. Compare both models and state which one is better at solving the problem.

Grading Criteria

Category	Description	Marks
Problem Selection and Justification	• Clear explanation of the problem, its importance, and relevance to real-world applications. • Justification of why machine learning is an appropriate solution for the selected problem.	20
Dataset Selection and Pre-processing	• Appropriateness and quality of the dataset for solving the problem. Clear description of dataset features, target variable, and size. • Application of necessary data pre-processing steps with justification.	20
Model Selection and Implementation	• Appropriateness of the two selected ML algorithms with clear justification. • Correct implementation of both models, including training without hyperparameter optimization.	20

Model Evaluation and Comparison	• Proper evaluation of models using appropriate metrics and interpretation of results. Clear and logical comparison of both models with justification for the chosen 'better' model.	20
Demo	• Smooth and engaging demonstration of the solution during Lab 12. All team members demonstrate clear understanding of the workflow, including problem selection, pre-processing, model implementation, and evaluation.	20
Total		**100**

Best of luck!