SEPT 785: Machine Learning

Overview

This project provides hands-on experience in applying machine learning techniques to a real-world dataset. Students will work in teams (maximum of 3) or individually to complete the project in structured phases.

Project Timeline & Deliverables	Grading Breakdown
Week 5 (Starting Tuesday, February 6): Project Groups and Topic Selection **Deliverable (Due by Friday, February 9):** Submit a brief project proposal (1-2 pages) that includes: • Project title and description • Team members (if applicable) • Problem statement • Dataset source (or plan for data collection) • Expected outcome **Evaluation Criteria:** Clarity of problem statement, feasibility, and relevance to ML.	**5**
Weeks 6-7 (February 12 - February 23): Data Collection and Pre-processing **Deliverable:** Submit a Jupyter Notebook/Python script demonstrating: • Data acquisition (if applicable) • Cleaning, handling missing values, and feature engineering • Exploratory Data Analysis (EDA) with visualizations **Recommended Tools:** Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn **Evaluation Criteria:** Completeness of preprocessing, quality of visualizations, justification of preprocessing steps.	**10**
Weeks 8-10 (February 26 - March 15): Choosing and Applying ML Algorithm(s) **Deliverable:** Submit a Jupyter Notebook/Python script covering: • Selection of ML model(s) and justification	**20**

• Model training and hyperparameter tuning • Performance evaluation (e.g., accuracy, precision, recall, F1-score) **Recommended Tools:** Scikit-learn, TensorFlow/PyTorch **Evaluation Criteria:** Justification of ML model choice, performance metrics, and interpretation of results.	
Weeks 11-12 (March 18 - March 29): Video Presentation **Deliverable (Due by March 29):** A **10-minute recorded video** explaining: • Project objective & dataset overview • ML model selection and key findings • Challenges faced and future improvements **Evaluation Criteria:** Clarity, engagement, technical depth, and communication.	**20**
Week 13 (April 1 - April 5): Peer Review and Discussion **Deliverable:** Each student must review and provide constructive comments on 5 other projects. **Evaluation Criteria:** Thoughtfulness, depth of feedback, and relevance to ML concepts.	**5**