CMPT 3830: Project Proposal Template

1. Project Title:

Provide a clear and descriptive title for your project.

Vehicle Price Prediction Model

2. Project Overview:

- Objective:

Briefly describe the main goal of the project.

Develop a machine learning-based regression model to predict the best price of vehicles based on key attributes such as year, make, model, and mileage.

The goal is to assist Go Auto dealerships in optimizing pricing strategies to maximize sales while maintaining competitiveness.

- Background:

Provide context or background information relevant to the project.

Vehicle pricing is influenced by multiple factors, such as make, model, mileage, and year of manufacture. This project aims to create an accurate pricing model that can provide price estimates or ranges based on historical data by leveraging machine learning techniques.

Background:

The dataset, compiled by the **Business Intelligence Team at Go Auto**, includes vehicle listings (both active and sold) collected over the last 30 days from multiple dealerships in Edmonton. The data includes vehicle characteristics, dealership locations, and listing specifics. By leveraging this dataset and utilizing regression-based machine learning models, we aim to enhance pricing strategies to improve dealership operations and customer satisfaction.

- Scope:

Define the scope of the project, outlining what will and will not be included.

Included:

- Data exploration and preprocessing (handling missing values, feature selection, encoding, normalization)
- Development of a supervised regression model (e.g., Linear Regression, Random Forest, or Gradient Boosting)
- Model evaluation using performance metrics such as **Mean Squared Error (MSE)**
- Data visualization using **Power BI**
- Business insights and recommendations for Go Auto

Not Included:

- Direct implementation of the pricing model into Go Auto's live system
- External data beyond the provided dataset
- Customer behavior analysis outside pricing impact

3. Project Deliverables:

List the specific outputs or deliverables expected from the project.

1. Deliverable 1: E.g. Project Report -1
    - Data Exploration Report
    - Model Selection & Training
2. Deliverable 2:
    - Model Evaluation Report
3. Deliverable 3:
    - Power BI Dashboard
    - Final Report & Recommendations

4. Project Timeline:

Break down the project into phases and include estimated completion dates.

Milestone 1|	**Completion Date |**
Description of Go Auto's Dataset	Jan 28
EDA on Go Auto's Dataset	Feb 5
Results obtained after performing EDA on Go Auto's dataset.	Feb 10
Milestone 2|	**Completion Date |**
Demo 1	Feb 13
EDA Report	Feb 25
Milestone 3	**Completion Date**
Demo 2	March 10
Phase 2 Report	March 15
Final Demo	April 17

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6. Project Plan:

- Tasks and Activities:

Provide a breakdown of the tasks needed to complete the project.

Task	**Owner**	**Due Date**
Data Cleaning & Preprocessing	Bube Ohaneje	Jan 20
Feature Engineering	Bube, Ayo, Emem ,Monsurat	Feb 5
Model Selection & Training	Emem Antia	March 15
Dashboard Development (Power BI/Looker)	Ayo Pedro	April 1
Final Report Compilation	Monsurat	April 15

7. Resources Required:

List the resources necessary for completing the project.

Resource	Description of resource	Estimated Cost
Computing Resources	Google Collab / Jupiter Notebook	Open Source (Free)
Software	Python (Pandas, Scikit-Learn, Pandas, Seaborn, Matplotlib), Power BI,	Open Source (Free)
Dataset	Historical Data	Provided by Go Auto Business Intelligence Team
Collaboration Tool	Google Drive	Open source

8. Risk Management Plan:

Identify potential risks and strategies to mitigate them. .

Risk	Likelihood	Impact	Mitigation Strategy
Technical delays	Medium	High	Add time buffer
Incomplete or Missing value	High	High	Data cleaning and preprocessing steps
Data Quality	High	High	Data cleaning and preprocessing
Outliers	High	High	Removing missing values
Model overfitting	High	High	Use cross-validation and regularization techniques
Computing resource limitations	Low	Medium	Use cloud computing services if needed

9. Budget:

Provide an overview of the total budget for the project.

No external cost (all required tools and datasets are freely available).