Final Year Project Proposal Form

Project Title	Intelligent Vehicle Pricing and Recommendation Platform
Supervisor Name	Dr. Ku Day Chyi
Co-Supervisor Name (if any)	NA
Project Status	Student-Proposed
Industry Collaboration	No
Company Name, Contact Name, Contact Phone (if the answer to Industry Collaboration is Yes)	NA
Project Type	Application based
Project Specialization (Project Specialisation and Student Specialisation should match)	Data Science
Project Category (Pls. refer at the end of document for the selection of category based on the specialisation)	Data Analytics

Project Focus/Contribution (Pls. refer at the end of document for the selection of focus/contribution based on the specialisation)	Machine Learning
Project Description (Discuss Background, Problem Statement, Methodology, Expected Output/Significance in summary form)	1. Background: - The car industry is rapidly growing every day within the automotive industry with the rise of electric vehicle manufacturers in the country coming into our country. This certainly causes the used car market to increase as there are a wide variety of car models, conditions, and price available. Therefore, some market has put a fair price in listing out the cars being sold while some are simply overpriced. By founding out certain factors such as mileage, brand, manufacturing year, engine type, and market demand will play significant roles in influencing vehicle prices. By using data analysis and machine learning, we can gain important insights from vehicle datasets that can help predict fair values more accurately 2. Problem Statement: i. Unreliableness of Used Car Prices Set by Seller - The prices of used vehicles determined by sellers are frequently unreliable and inconsistent, as some may rely on subjective estimations rather than objective market data. This lack of pricing transparency reduces buyer confidence and makes it difficult to identify vehicles offering fair value. An intelligent, data-driven approach is needed to enhance pricing reliability and improve decision making in the used car market. ii. Lack of Analytical Tools - The current platform we have for buying and selling cars act as listing services without analytical insights on the car's history prices and even future prediction of its values

iii. Multi factor Complexity in Pricing
 - Most used car prices depend on factors such as mileage, brand, car model, year, and transmission. Some may even look at the accessories or technologies the car has in setting up its price. These multiple factors make it difficult to determine a fair and consistent value for each car

3. Methodology
    I.   Data Collection and preparation:
    - Dataset will get from Kaggle Used Car dataset.
    - Data processing will involve in handling missing values, normalizing data and also encode categorical variable
    - Exploratory Data Analysis will be done to identify trends and patterns between attributes and price

    II.   Model Development:
    - Machine Learning Models will be trained to predict vehicle prices based on common features

    - Deep Learning Models will be trained to capture the complex, nonlinear relationships among price factors

    Recommendation System:
    - A recommendation model will then be developed to suggest vehicles to users based on preference and suitability
    III.   Model Evaluation:
    - The performance of these models will be evaluated using R^2 score, Root Mean Square Error, and Mean Absolute Error

4. Expected Output/Significance:

- Able to predict accurate vehicles price
- Recommending vehicle that suits user's preferences
- Provide visual analytics to help user understand trends

Project Objectives (Focused and precise list of statements that can imply the goals to be achieved, Majority of the Project Objectives – using SMART objectives)	1. To develop a machine learning and deep learning model that can accurately predict used vehicle prices 2. To implement an intelligent recommendation system that suggests suitable vehicles according to user's preferences. 3. To visualize analytical insights through dashboards to help users understand the pricing patterns, market trends of vehicle prices.

Project Outcomes	1. To make sure the trained models are able to predict used car prices accurately.
(Outcomes are in line with the Project and Student specialisation)	2. To improve understanding of used vehicle pricing through analysis.
	3. To create a recommendation system that is able to suggest cars based on user's preferences
Project Scope (Focus/Expected Output/ Deliverables with the limits and constraints of the study can be described and implies enough scope for the two-trimester project)	1. Dataset that is cleaned and ready for model training and evaluation.
	2. Develop machine learning and deep learning models to predict used vehicle prices based on attributes.
	3. Create a recommendation system that suggest cars based on user's preferences.
	4. Show an analytical visualisation showing the pattern and trends influencing price.

Number of Students (If it is two-students project, subtitles and work distribution must be clearly specified and differentiated for each student)	One
Student 1 Subtitle (Pls. fill up if the number of students is two)	NA
Student 1 Work Distribution (Pls. fill up if the number of students is two)	NA
Student 2 Subtitle (Pls. fill up if the number of students is two)	NA
Student 2 Work Distribution (Pls. fill up if the number of students is two)	NA

Student 1 Details (Student Name, Student ID, Specialisation, Handphone number, E-mail address)	Name: Mohamad Zulhafiz Bin Mohd Jaafar ID: 1211201542 Specialisation: Data Science Phone Number: 013-4336103 E-mail: 1211201542@student.mmu.edu.my
Student 2 Details (if it is a two-student project) (Student Name, Student ID, Specialisation, Handphone Number, E-mail address)	NA

Select one Project Category based on Specialisation:

Software Engineering:

Critical System

Application Software

Software Tools & Utilities

Service Oriented Computing

Data Science:

Data Engineering

Data Analytics

Cybersecurity:

Cryptography and Data Security

Investigation and Analysis

Security and Defence

Game Development:

Game Software Development (GSD)

Game Algorithm Research (GAR)

Game Design Prototyping (GDP)

Information Systems:

IT Infrastructure

Transaction Processing Systems

Intelligent Systems

Select one Focus/Contribution based on Specialisation:

Software Engineering:

Product Development

Prototype/Proof of Concept

Software Engineering Methodologies

Others (Pls. specify)

Data Science:

Data Management

IoT

Optimisation of Technologies

Analysis of data (texts, videos, images, numerical digit)

Others (Pls. specify)

Cybersecurity:

Cryptography

Database Security

Blockchain

Malware analysis

Forensics

Ethical hacking

Network and Cloud Security

Others (Pls. specify)

Game Development:

Game Software Development (GSD): Development and implementation of a complete game from design, programming to production of a complete game installation package

Game Algorithm Research (GAR): Thorough investigation and analysis of specific algorithms used in games

Game Design Prototyping (GDP): Proof of concept of novel specific game design concepts or game mechanics via development of complete prototypes

Information Systems:

Data & Information Management

User Experience

System Analysis & Design

IS Project Management

Business Processes

Technology Evaluation

Others (Pls. specify)