Project Initialization and Planning Phase

Date	15 JULY 2024
Team ID	740033
Project Title	Car Performance Prediction
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

To explain Car Performance Prediction (CPP) analyzer using machine learning (ML), you can structure it similarly to the project proposal template shown in the image. Here's an outline:

Project Overview	
Objective	Develop a machine learning model to accurately predict car performance metrics, optimizing design and enhancing vehicle efficiency.
Scope	Project Overview: Develop a comprehensive model to predict car performance metrics, optimizing design factors for speed, fuel efficiency, and handling through advanced data analysis and modeling techniques.
Problem Statement	
Description	Developing a model to accurately predict car performance metrics such as speed, fuel efficiency, and handling using data-driven approaches for enhanced design and optimization.
Impact	Problem Statement Impact: Accurate car performance prediction enhances vehicle design precision, optimizes fuel efficiency, and informs market competitiveness, driving advancements in automotive engineering and consumer satisfaction.
Proposed Solution	
Approach	Utilize machine learning algorithms to analyze vehicle data for accurate prediction of performance metrics like speed, fuel efficiency, and handling.

Resource Type	**Description**	**Specification/Allocation**
Hardware		
Computing Resources	High-performance CPUs/GPUs	e.g., 2 x NVIDIA V100 GPUs
Memory	Sufficient RAM for large datasets	e.g., 32 GB
Storage	Large storage for data, models, and logs.	e.g., 512 SSD
Software		
Frameworks	Python frameworks	e.g., Tenser flow, sklearn, keras.
Libraries	Pandas, NumPy, Matplotlib for data manipulation and visualization	e.g., numpy, pandas.

Development Environment	Jupyter Notebooks, IDEs	e.g., Pycharm
Data		
Data	Source: Vehicle Manufacturers:Telematics and Sensor Data:Public Databases:	e.g., Kaggle

Data collection:	**Sources:**Manufacturer Specifications:Manufacturer Specifications:Telematics Data: Driver Behavior Data:Environmental Conditions: Historical Maintenance Records:
Data preprocessing:	**Cleaning:** Handle missing values, remove outliers **Transformation:** Normalize/standardize data **Feature Engineering:** Create new features from raw data
Model Training:	**Algorithms:** Linear regression, random forest, gradient boosting, deep learning models **Evaluation:**Mean Absolute Error (MAE) Root Mean Squared Error (RMSE) R-squared (R^2) Mean Absolute Percentage Error (MAPE) **Integration:** Real-time data ingestion and prediction **Visualization:** Scatter Plots.Histograms.Residual Plots

Resource Requirements

	platforms (e.g., Kaggle) Size: Varies depending on the region and time span Format: CSV, JSON, realtime API feeds	