**Project Initialization and Planning Phase**

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| Date | 15 JULY 2024 |
| Team ID | 739672 |
| 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:

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| **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 |

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| 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**

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