“Easy Car Care: Troubleshooting Guide and Car General Maintenance System”

A Research Proposal
presented to the Faculty of the
Department of Information Sciences
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Marawi City

In Partial Fulfillment of the Requirements
In ITD110 (NoSQL)

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INTRODUCTION

Begin by thoroughly examining the dataset provided. Understand its structure, including the number of features, their types (categorical, numerical), and the target variable(s) you aim to predict. Identify any missing values, outliers, or anomalies that may affect the quality of your analysis. Determine if preprocessing steps such as handling missing values, encoding categorical variables, or scaling numerical features are necessary to prepare the data for modeling.

The Easy car care: Troubleshooting guide and car general maintenance system is a centralized system that provides general maintenance instructions and a troubleshooting guide to make the process of taking care of your car easier. The system aims to equip users with the information and tools necessary to maintain their cars in excellent shape as well as handy repairs for typical automotive problems.

Choose an appropriate regression model based on the nature of your problem, the distribution of your data, and the assumptions of the regression method.

Consider experimenting with various regression algorithms such as linear regression, decision tree regression, random forest regression, support vector regression, and others to find the best fit for your dataset.

The capstone project can contribute and benefit to society because it is a platform that prioritizes accessibility by providing car-related solutions that are suitable for users with varying levels of experience. By providing clear instructions and step-by-step troubleshooting guides, the application enables users to address typical issues, thereby reducing reliance on costly expert services. Cost-effective auto maintenance and repairs can be expensive, particularly when small problems get worse because they are ignored. The program may enable timely repairs and preventive maintenance, which could save users a significant amount of money over time by assisting in the early detection of issues. And the system addresses this issue by offering quick solutions and organized maintenance schedules, enabling users to efficiently manage their vehicle care tasks and freeing up valuable time. The system helps to maintain a sustainable environment. In addition to extending a vehicle's lifespan, proper car maintenance lowers emissions and preserves resources for future generations. Easy car care: Troubleshooting guide and car general maintenance system promotes environmentally friendly driving practices by promoting routine maintenance and quick issue resolution, making it a useful resource for both vehicle owners and the larger community.

Evaluate the performance of the trained model using the testing dataset. Use appropriate evaluation metrics such as Mean Squared Error (MSE), Root Mean Squared Error (RMSE), Mean Absolute Error (MAE), R-squared (R2), and others to assess the model's predictive accuracy. Compare the model's performance with baseline models or other benchmarks to gauge its effectiveness.

Train the selected regression model using the training dataset. During training, the model learns the patterns and relationships present in the data.

Adjust the model's hyperparameters if necessary to optimize its performance. Hyperparameters are settings that control the learning process and can significantly impact the model's predictive ability.

General Objective:

To develop an integrated automotive platform that enhances car owners' understanding and management of vehicle maintenance by providing a user-friendly interface for symptom-based issue diagnosis, personalized maintenance schedules, educational resources on fundamental car maintenance tasks, and a community-driven space for knowledge-sharing and feedback.

Specific Objectives

- To create a user-friendly interface for diagnosing common car issues based on user-input symptoms and providing tailored troubleshooting suggestions.
- To build a database of recommended maintenance schedules tailored to specific car makes and models, guiding users on essential tasks like oil changes and tire rotations.
- To offer services, and tutorials covering fundamental car maintenance tasks such as oil changes, engine tune up, tire replacement, and overall chechup to empower users with practical knowledge.
- Establish user registration to personalize advice and gather feedback on troubleshooting effectiveness, fostering a community-driven platform for car care enthusiasts to share knowledge and experiences.

Scope and Limitation

This project encompasses the development of a comprehensive system offering general car maintenance instructions and troubleshooting guides in MSU-Marawi Campus, Marawi City. A database will be created containing recommended maintenance schedules specifically tailored to various car makes and models.

The system's effectiveness is contingent upon the accuracy and completeness of user-provided information, with inaccurate symptom descriptions potentially leading to incorrect troubleshooting suggestions, includes the system's inability to physically inspect vehicles, potentially hindering the diagnosis of hands-on problems. While offering services on routine maintenance and common issues, the

system may not encompass all possible car problems or complex repairs necessitating professional assistance. The accuracy of maintenance schedules and troubleshooting advice relies on the availability and precision of data for various car makes and models. User privacy and data security are critical considerations due to the collection and storage of personal information and user feedback.

REFERENCES

J. S. Liang, “An approach with multi-tier automotive knowledge formalization for troubleshooting activities - Jeremy S Liang, 2023,” *Proceedings of the Institution of Mechanical Engineers, Part D: Journal of Automobile Engineering*, 2023.