Fair Price Prediction System for Used Cars in Sri Lanka

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1. Introduction

This project aims to develop a predictive pricing system for used cars in Sri Lanka using historical data and machine learning techniques. It seeks to address current challenges such as inconsistent valuations in the market, aiming to enhance transparency and efficiency. By leveraging big data and machine learning advancements, the system aims to provide accurate and reliable fair market value assessments, benefiting both buyers and sellers.

1.1. Summary of literature

Previous studies on used car price prediction have employed various machine learning techniques, such as linear regression, decision trees, and neural networks. Smith et al. (2019) used linear regression with features like age, mileage, and brand, achieving moderate accuracy but struggling with non-linear relationships. Jones and Patel (2020) utilized a random forest model, including additional features like service history and economic indicators, significantly improving predictive performance but requiring extensive computational resources. Lee et al. (2021) applied neural networks with extensive historical data, achieving high accuracy but facing challenges with over fitting and data intensity.

These studies used datasets containing vehicle characteristics, historical prices, and contextual data, producing price predictions and insights into feature importance. Smith et al. (2019) provided a baseline understanding, Jones and Patel (2020) highlighted the value of broader data, and Lee et al. (2021) demonstrated the potential of neural networks for complex predictions. However, limitations include issues with non-linear relationships, computational demands, over fitting, and data requirements.

Notably, there is limited research focused on the unique Sri Lankan market. Addressing this, our project aims to develop a robust and efficient price prediction system tailored to Sri Lanka, leveraging historical data to enhance feature selection and model performance.

1.2. Problem definition

The problem identified is the inadequacies in current car price prediction systems, specifically regarding data quality, adaptability to market dynamics, and transparency in model interpretability. These shortcomings lead to unreliable valuations of used cars, creating distrust and potential financial risks for buyers and sellers.

2. Goal of the project

The goal of this project is to create an advanced prediction system using historical data to identify fair prices and recommend new features for cars. It will analyze large datasets including past auto prices, market trends, customer preferences, and vehicle specifications using machine learning algorithms and data analytics.

3. Aims and objectives

To develop an innovative and accurate system that predicts fair prices for used cars in Sri Lanka by analyzing historical data and incorporating new features, enhancing the transparency and efficiency of the used car market.

Objectives:
- Data Collection
- Data Analysis
- Model Development
- Feature Prediction

- User Interface

4. Proposed methodology

The project involves data collection from historical records encompassing prices, features, conditions, and other pertinent factors of cars. This data is then analyzed to discern influential factors on pricing and features. Using machine learning algorithms, predictive models are developed to estimate fair prices based on car attributes and condition, facilitating accurate feature predictions that impact market value. Finally, a user-friendly interface is crafted to allow seamless input of car details by users, providing instant predictions of both price and key features. This integrated system aims to enhance decision-making in the car market of Sri Lanka by offering robust insights and predictions.
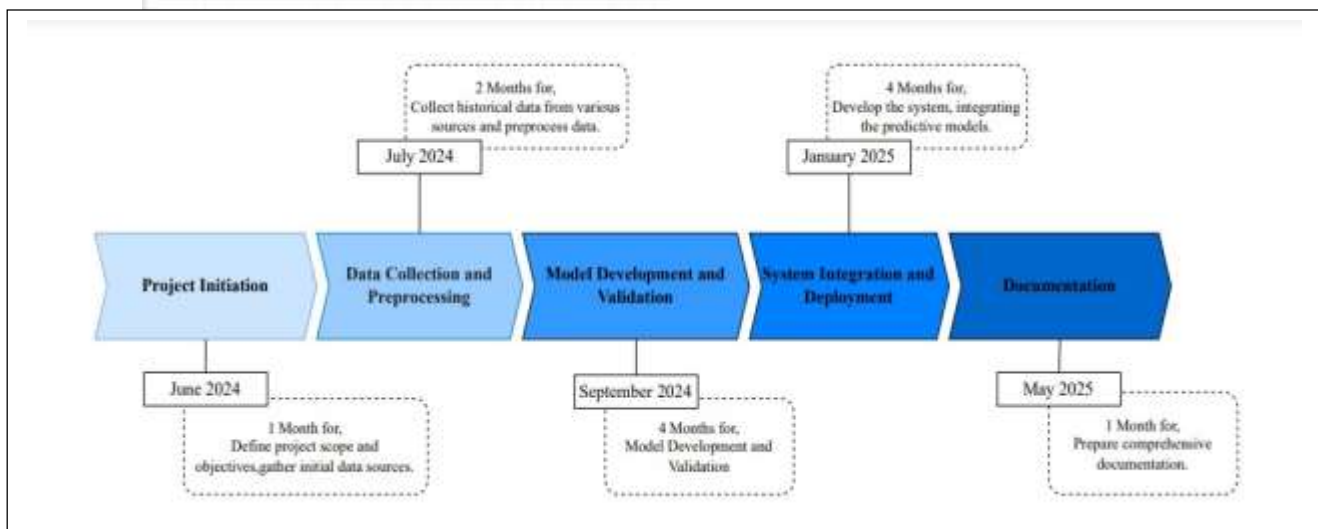
5. Resource requirements

- Access to historical car sales data.
- Software tools for data analysis (Python, R) and Web Development Tools: HTML, CSS, and JavaScript for frontend development: backend frameworks such as Django or Flask.
- Machine learning libraries (scikit-learn, TensorFlow).

6. Timeplan

crucial step towards enhancing market transparency and efficiency. Addressing current limitations such as data quality issues, adapting to dynamic market conditions, and ensuring model interpretability will be paramount. Further work should focus on refining predictive models with localized insights, exploring hybrid modeling techniques, and integrating real-time data for more accurate and timely predictions. By overcoming these challenges, the system aims to provide reliable pricing guidance, fostering trust and informed decision-making among stakeholders in the Sri Lankan car market.

8. References

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7. Conclusion

In conclusion, developing a new features and fair price prediction system for used cars in Sri Lanka using historical data represents a