Predicting Car Prices with Machine Learning.

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Abstract

The manufacturer sets the fixed price for new cars in the industry, which includes additional taxes imposed by the Government. This assures customers that their investment is worth the money spent. However, the increasing prices of new cars and financial constraints have led to a rise in the sales of used cars globally. As a result, there is an urgent need for an effective Used Car Price Prediction system that can determine the value of a car based on various features. The current system involves the seller randomly setting a price, leaving the buyer unaware of the car's value in the current market. The seller is also unsure of the car's existing value or the appropriate selling price. To address this issue, a highly effective model has been developed using regression algorithms that provide continuous output values instead of categorized ones. This approach enables the prediction of the actual price of a car instead of a price range. Additionally, a user interface has been created to acquire inputs from users and display the price of a car based on their inputs. By using the car price prediction model, buyers and sellers can make informed decisions about the fair value of a car and negotiate better prices. The model can also assist car dealerships and other businesses in the automobile industry by providing accurate car valuations and improving their pricing strategies. The accuracy of the car price prediction model directly depends on the quality and quantity of data used to train it, as well as the relevance and selection of features. Overall, the car price prediction model is a powerful tool that can provide significant value to individuals and businesses in the automobile market.

1. Problem Statement

The automobile market is vast and complex. Buyers often struggle to determine a car's fair value, while sellers may not price their cars competitively due to the lack of market knowledge. This results in a market inefficiency where both buyers and sellers suffer from a lack of transparency and information.

2. Market/Customer/Business Need Assessment

2.1 Market Assessment

The automobile industry is one of the world's largest and most dynamic industries, with millions of cars being launched and sold each year. In recent years, there has been a significant increase in online car sales, making it easier for buyers and sellers to connect. The increasing trend towards online car sales provides an excellent opportunity for a car price prediction app, as it can help buyers and sellers make good decisions and negotiate for better prices. The market size for such an app is significant, and there is a growing demand for efficient and reliable car valuation tools.

2.2 Customer Assessment

The target customers for the car price prediction app are both buyers and sellers. Buyers can use the app to determine the fair value of a car and negotiate better prices, while sellers can

price their cars competitively and attract buyers. The app caters to individuals who want to save time and money by making an informed decision about buying and selling. Additionally, car dealerships and other businesses in the automobile industry can benefit from the app by providing customers with accurate car valuations and improving their own pricing strategies.

2.3 Business Assessment

The car price prediction app can generate revenue through several channels, such as subscription fees, commission-based models, and advertising. Additionally, the app can partner with car dealerships and other businesses in the automobile industry to provide value-added services such as customized valuations and market insights. Overall, the car price prediction app has significant potential for growth and profitability in the automobile industry

3. Target Specification

Due to a lack of market knowledge, we need an efficient and reliable way to estimate the fair value of a car based on several factors like the year, model, mileage, type, and so on by making the process of buying and selling more transparent and efficient.

4. External Search

a. https://towardsdatascience.com/predicting-car-price-using-machine-learning-8d2df3898f16

b.https://medium.com/odscjournal/predicting-car-prices-using-machine-learning-and-data-science-52ed44abab1b

c. https://www.irjet.net/archives/V8/i4/IRJET-V8I4278.pdf

4.1 Applicable Constraints

- Data Availability
- Data Privacy
- Legal and regulatory constraints
- Technical Constraint
- Cost Constraint

4.2 Applicable Regulations

- Data Protection and privacy regulation
- Consumer protection laws
- Automotive industry regulation
- Anti-money laundering law

5. Business Model

One possible business model for car price prediction would be to create a subscription-based service for users who want access to the car price prediction model. This service could be marketed to car dealerships, auto finance companies, and individual car buyers who are interested in predicting the value of a vehicle.

The subscription service could offer users access to the predictive model and a user-friendly interface that would allow them to input the necessary data and receive a prediction of the car's

value based on several factors. The service could also offer additional features, such as historical pricing data, market trends, and analysis of similar cars in the area.

We can offer the car price prediction model as a paid API service to other businesses and applications. This would allow third-party developers to integrate the car price prediction model into their own applications, such as car buying and selling platforms, insurance providers, or automotive review sites.

Overall, a subscription-based service or paid API service could be an effective business model for car price prediction, providing a valuable service to businesses and individual customers while generating revenue for the company.

6. Final Product Prototype

1. User Interface: The application would have a user interface that is designed to be user-friendly and simple to navigate. Users would be able to easily input information about the vehicle, such as the make, model, year, mileage, engine size, fuel type, and transmission type using the user interface.

2. Data Collection: The app would collect data from various sources, including public records, car dealerships, and private sellers. The app would also collect historical pricing data and market trends to help inform the prediction model.

3. Prediction Model: The app would feature a predictive model based on machine learning algorithms that take into account various factors to predict the price of the car.

4. Visualizations: The app would feature interactive visualizations that display the predicted price of the car based on the input data. Users could also view historical pricing data and market trends to help users for better decision-making.

5. Integration: The app could be integrated with other platforms such as car dealerships, auto finance companies, and automotive review sites to provide a more comprehensive solution for users.

Schematic Diagram
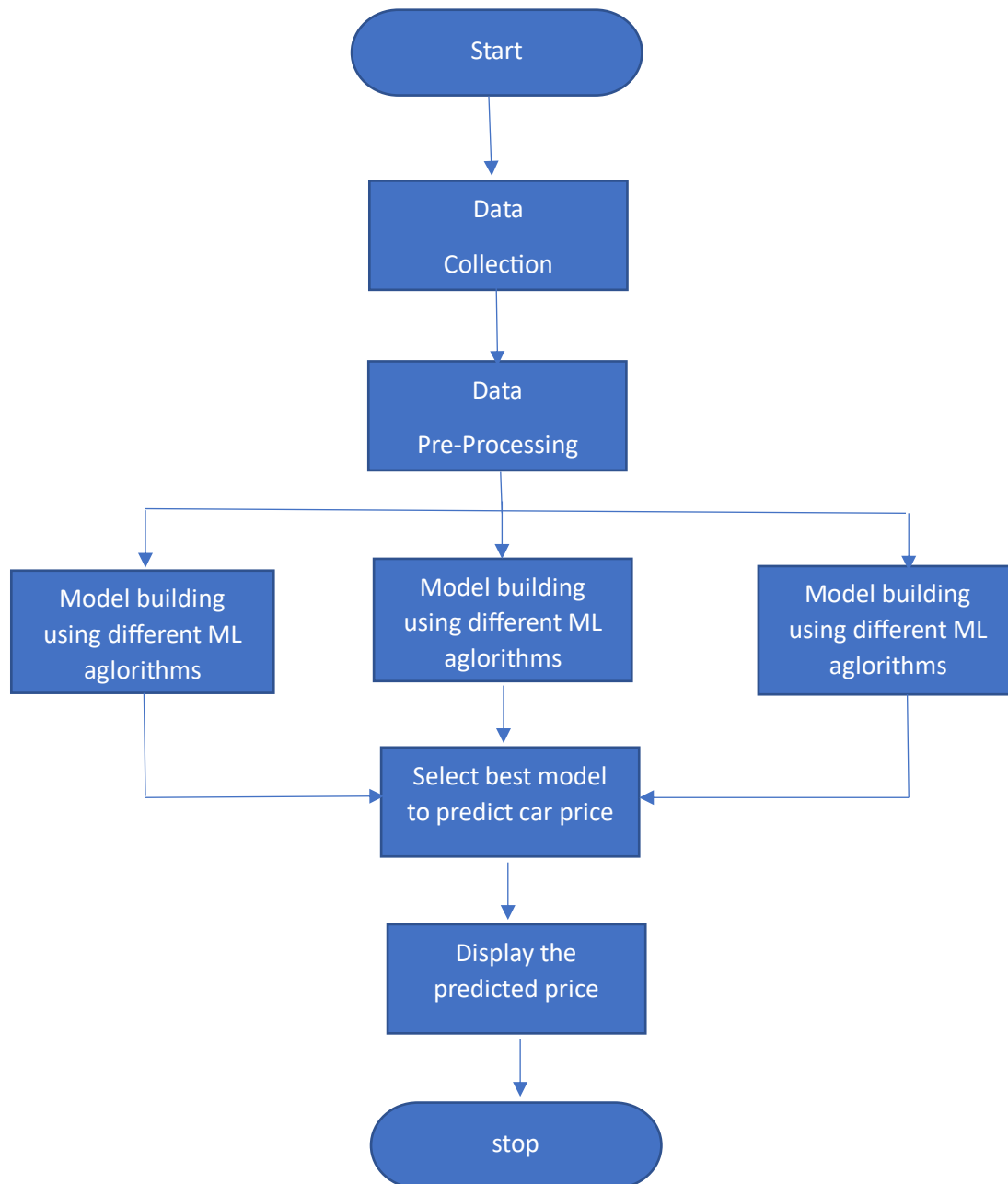
7. Conclusion

Due to the higher prices of new cars and customers' limited financial resources, there has been a global surge in the sales of used cars. This has created an urgent need for an effective Used Car Price Prediction system that can accurately assess the value of a car based on a variety of features.

The proposed system aims to determine the precise price of a used car by utilizing various features, thereby helping customers make informed decisions when purchasing a used vehicle.