Cars Price Prediction Using Machine Learning

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Abstract — Current trends indicate that internet searches for pre-owned cars have witnessed a drastic increase globally, with some markets witnessing more than 40% growth in a single year, indicative of increased dependence on the internet for conducting used car sales. This mirrors the increasing demand for reliable car valuation software in the online world. In this context, the current research proposes AutoValuator, an internet-based tool to forecast the second-hand value of automobiles. AutoValuator makes use of a complex machine learning algorithm called Random Forest Regression to forecast the resale value of an automobile based on various attributes of the vehicle. The system considers key parameters of the automobile including the brand, model, manufacturing year, cumulative distance covered, fuel efficiency (mileage), engine capacity, seating capacity, fuel type, and transmission type. This research paper describes AutoValuator's development and use with the perspective of creating a useful tool to support individuals and companies involved in the global second-hand car trade. The result of this study contributes to furthering the interests of machine learning-based solutions to the automobile business, promoting better transparency and value-based decision making in used vehicle transactions.

Keywords — *Car Price Prediction, Machine Learning Techniques, Random Forest Regression Model, Web-Based Pricing, Used Vehicle Market, AutoValuator.*

I.   INTRODUCTION

In our day-to-day lives everyone buys and sells a car every day. Despite the frequent buying and selling of cars, tools for accurate price determination are limited. There are two ways in which the re-selling of the vehicle is carried out. One is offline and the other is online. In offline transactions, there is a mediator present in between who is very vulnerable to being corrupt and making overly profitable transactions. The second option is online wherein there is a certain platform which lets the user find the price he might get if he goes for selling.

- Kilometers driven – A vehicle's mileage in kilometers is a significant factor in resale value. The higher the mileage, the more wear and tear, and this tends to decrease the vehicle's price.

- Engine Power – A vehicle's engine power impacts its value. High-powered engines often lead to increased sale prices.

- Manufacturing Year – The age of a car, represented by its manufacturing year, is among the most significant factors in establishing its price. Newer cars are more expensive, and depreciation is felt each year.

- Fuel Type – The dataset has various fuel types, i.e., Petrol, Diesel, CNG, LPG, and Electric. These types of fuel have varying distribution in the dataset.

Due to these factors, a self-learning machine learning system is required. To address this, a set of objectives was established, with the project's real-time nature as a key consideration.

A. OBJECTIVE

- Develop a machine learning system that can accurately predict car prices using various features.

- Make it a simple-to-use platform that facilitates fair and efficient car deals through accurate price quotes, feature-for-feature comparison, and graphic comparisons.

- Improve the understanding of what influences the prices of vehicles and streamline the entire efficiency of buying and selling cars.

B. SCOPE OF CAR PRICE PREDICTION

- Integration with real -time data sources from various motor vehicle websites to improve price prediction accuracy.

- Including adequate amounts of historical car value data to increase the model's learning abilities.

- Development of an Android application to provide users with convenient access to a car value prediction system.

- To customize the performance of the model, the advanced deep-learning architecture, the rate of adaptive learning, and the discovery of data clustering techniques.

C. FEATURES

- Car Price Prediction: A centralized platform for car resale that will predict prices.

- Feature-Based Interaction: Functionality for feature-based search and price prediction.

- Report Generation:

    ➢ Graphical representation (line chart) of predicted car prices for the next five years.

    ➢ Negotiation guidance to assist users in achieving favorable pricing.

II. LITERATURE REVIEW

This chapter underlines relevant applications and functioning for the development of this project. A background survey detected the predictions of the car, focusing on technical piles, algorithms and current system boundaries. Many platforms and applications provide insight into car evaluation and sale scenarios.

A. CARS24

Cars24, an Indian e-commerce platform, that collects data and facilitates the sale of cars used by collecting data on parameters such as car model, mileage, year and fuel type of registration, this data is then used to predict vehicle prices using proprietary algorithm. This platform displays the application of data analysis in the used car market.

B. GET VEHICLE PRICE

Get vehicle price is an Android application that provides vehicle price predictions based on parameters like engine power, horsepower and mileage. This application appoints machine learning techniques to estimate the value of various vehicle types including cars, bikes, electric vehicles and hybrid vehicles. This highlights the use of machine learning for diverse vehicle evaluation (obtaining the price of the vehicle).

C. CARWALE

Carwale is a major Indian platform for new and used car research. It provides information on on-road prices, user and expert reviews and car comparisons. Carwale also combines users with car dealerships, focusing on information spread and market access.

D. CARTRADE

Cartrade is a web and android platform that allows users to do research on new cars, providing details on prices, specifications, images, mileage and reviews. The Cartrade enables users to sell cars by listing with relevant details, connecting vendors to potential buyers.

III.   LITERATURE SURVEY

Feature	AutoValuator	Cars24	Get Vehicle Price	CarWale	CarTrade
Core Functionality	Predicts car prices based on user input.	Platform for selling used cars with price prediction.	Predicts vehicle prices.	Provides information on new and used cars.	Platform for researching new cars and selling used cars.
Price Prediction Method	Uses machine learning to estimate car prices.	Uses algorithms to predict prices based on parameters.	Uses a machine learning approach.	Provides on-road prices.	Provides car prices.
Input Parameters	Brand, model, manufacturing year, kilometers driven, fuel efficiency (mileage), engine capacity, seating capacity, fuel type, and transmission type.	Car model, kilometers traveled, year of registration, vehicle type (fuel).	Fiscal power, horsepower, kilometers traveled.	N/A	Car details like image, model, year of purchase, and kilometers.
Output	Estimated car price.	Predicted price.	Predicted price of car, bike, electric vehicle, and hybrid vehicle.	Accurate on-road prices.	Car prices.
User Interface	Easy-to-use website.	Simplified user interface.	Android app.	CarWale app.	Web and Android platform.
Additional Features	Report Generation: 5-year price prediction graphs, negotiation tips.	Facilitates car sales.	N/A	User and expert reviews, car comparison tool, connects with car dealers.	Car specifications, images, mileage, reviews, car comparisons, connects sellers with buyers.
Strengths	Provides detailed car price estimations, includes report generation with future price prediction and negotiation tips, aids in decision-making.	Simplifies the process of selling used cars.	Predicts prices for a variety of vehicle types.	Predicts prices for a variety of vehicle types.	Offers comprehensive information for car research and facilitates used car sales.
Limitations	Initial version does not include car loan estimation or insurance suggestions.	Potentially inconsistent or inaccurate due to subjective judgment.	May have limited accuracy for niche vehicle types or in volatile markets.	Price information might not reflect real-time market fluctuations or specific vehicle conditions.	Used car pricing accuracy can be affected by the completeness and accuracy of seller-provided information.