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Car Price Prediction Using Machine Learning

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ABSTRACT

Car price prediction is a significant application of machine learning in the automobile industry. The price of a car depends on several parameters such as brand, model, year of manufacture, fuel type, seller type, transmission type, and the number of previous owners. Determining the accurate value of a vehicle manually is difficult because many factors influence its market value. This project proposes a machine learning based system that predicts the price of a car based on historical vehicle data. The model is trained using regression algorithms and implemented using Python programming language. A user-friendly interface allows users to enter car details and obtain the predicted price instantly. The proposed system can assist car buyers, sellers, and automobile dealers in determining a fair market price for vehicles.

INTRODUCTION

The automobile industry has experienced tremendous growth in recent years. With the increase in used car markets and online automobile selling platforms, predicting the correct price of a car has become an important task. The price of a vehicle depends on multiple attributes such as brand, fuel type, mileage, transmission system, and manufacturing year. Traditional price estimation methods rely on human expertise and manual comparison, which can be inaccurate and time-consuming.

Machine learning provides a powerful solution for predicting car prices by analyzing historical data and identifying relationships between different variables. By training a machine learning model with a dataset containing car features and corresponding prices, the system can learn patterns and make predictions for new data. In this project, a car price prediction system is developed using regression techniques to estimate the selling price of a vehicle.

OBJECTIVES

- To develop a machine learning model that predicts the price of a car.
- To analyze different car features affecting vehicle price.
- To implement the model using Python and machine learning libraries.
- To create a user interface where users can enter car details.
- To help buyers and sellers determine a fair car price.

LITERATURE REVIEW

Many researchers have explored the application of machine learning algorithms in predicting automobile prices. Regression algorithms such as Linear Regression, Decision Tree Regression, and Random Forest Regression have been widely used for price prediction tasks. Studies show that machine learning models

can effectively identify relationships between car specifications and their market values.
Some research studies also apply advanced algorithms such as Gradient Boosting and Neural Networks for improved prediction accuracy. Data preprocessing, feature engineering, and proper model evaluation are important steps in developing an accurate prediction system.

METHODOLOGY

The proposed system follows several steps to build the car price prediction model:

- Data Collection: Collect dataset containing car specifications and price.
- Data Preprocessing: Handle missing values and convert categorical data into numerical form.
- Feature Selection: Identify important attributes affecting price.
- Model Training: Train the regression model using machine learning algorithms.
- Model Evaluation: Evaluate performance using testing data.
- Prediction System: Provide interface where users can enter car features to get predicted price.

SAMPLE DATASET ATTRIBUTES

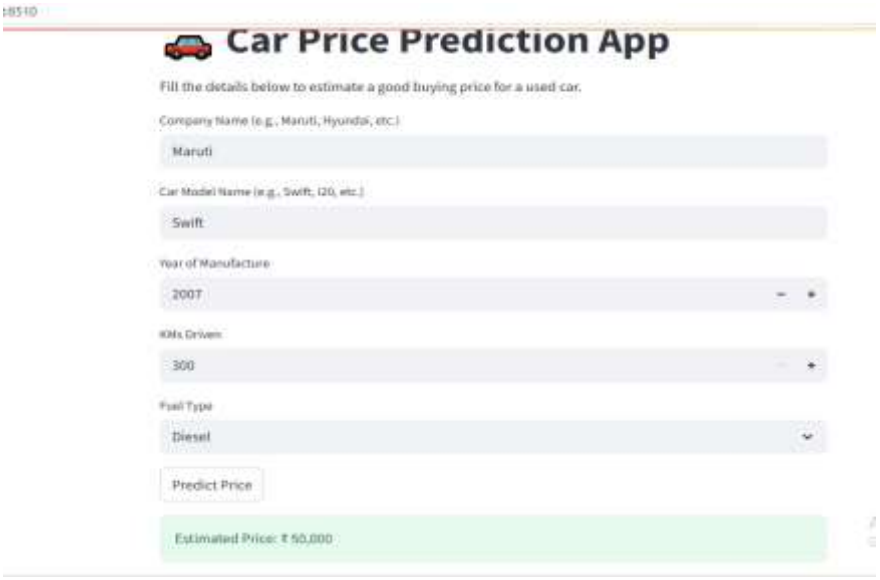
Attribute	Description
Car Name	Name of the vehicle model Year Manufacturing year of the car
Selling Price	Market selling price
Fuel Type	Petrol / Diesel / CNG Seller Type Dealer or Individual
Transmission	Manual or Automatic
Owner	Number of previous owners

TOOLS AND TECHNOLOGIES USED

- Python Programming Language
- Pandas for data manipulation
- NumPy for numerical computations
- Scikit-Learn for machine learning algorithms
- Matplotlib / Seaborn for visualization
- Streamlit for building web interface

RESULTS AND DISCUSSION

The trained machine learning model successfully predicts car prices based on input parameters. Experimental results show that regression algorithms provide reliable predictions when trained with sufficient data. The system generates quick price estimations, which can help users understand the approximate market value of vehicles.



CONCLUSION

This project demonstrates the use of machine learning techniques for predicting car prices. The developed model analyzes different vehicle attributes and provides an estimated price based on learned patterns from historical data. The system can support decision-making in the automobile market by providing accurate and quick predictions. Future work can involve using larger datasets and advanced algorithms to further improve prediction accuracy.

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