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Program: BS Artificial Intelligence

Semester: 03

Project Title: Car Selling Price Prediction

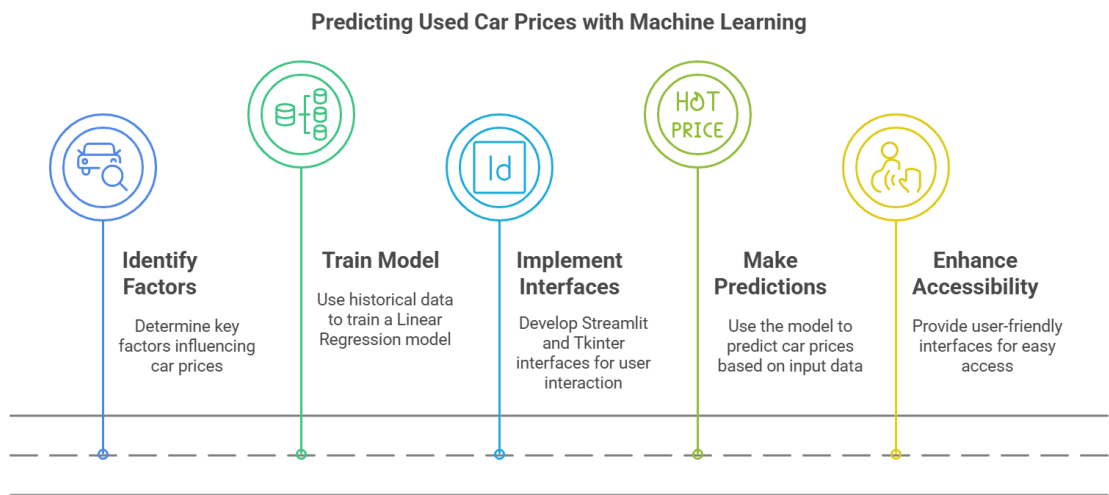
Submitted to: Sir Muhammad Tahir

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Abstract

This project focuses on developing a machine learning model to predict the selling price of used cars based on various factors such as manufacturing year, kilometers driven, fuel type, seller type, and transmission type. A Linear Regression model is trained on historical data to make accurate predictions. To enhance user accessibility, the project is implemented with two different graphical user interfaces: Streamlit (a web-based application) and Tkinter (a desktop application). The project demonstrates the effectiveness of machine learning in price estimation and offers a user-friendly interface for easy interaction.



Title: Car Selling Price Prediction Using ML

1. Introduction

The aim of this project is to develop a predictive model that estimates the selling price of used cars based on various features such as year of manufacture, kilometer driven, fuel type, seller type, and transmission type. The project employs a Linear Regression model trained in historical data to provide accurate price predictions. The user interacts with the model through two different GUI implementations: Streamlit and Tkinter.

2. Objective

- To develop a machine learning model for predicting car selling prices.
- To provide an easy-to-use interface for users to input car details and obtain predictions.
- To implement the GUI using both Streamlit (for web-based interface) and Tkinter (for desktop application).

3. Technologies Used

Programming Language: Python

Libraries Used:

- Machine Learning: scikit-learn (for model training and evaluation)
- Data Handling: pandas (for dataset manipulation)
- User Interface: Streamlit and Tkinter (for GUI implementation)

4. Dataset Description

The dataset used for training the model is a CSV file named car-data.csv. It consists of the following features:

Car_Name: Name of the car (dropped from the model as it is not a numerical feature).

Year: Year of manufacture.

Present_Price: Current market price of the car.

Kms_Driven: Distance the car has traveled.

Fuel_Type: Type of fuel used (Petrol, Diesel, CNG).

Seller_Type: Type of seller (Dealer or Individual).

Transmission: Type of transmission (Manual or Automatic).

Owner: Number of previous owners.

Selling_Price: The price at which the car was sold (target variable).

5. Data Preprocessing

- The Car_Name column was removed since it does not contribute to numerical analysis.
- Categorical variables (Fuel_Type, Seller_Type, Transmission) were converted into numerical format using one-hot encoding.
- The dataset was split into training (80%) and testing (20%) subsets to train and evaluate the model effectively.

6. Model Implementation

- A Linear Regression model was trained using the scikit-learn library.
- The model was evaluated using Mean Squared Error (MSE) to determine prediction accuracy.

7. Graphical User Interface (GUI) Implementation

The project includes two GUI implementations:

(i) Streamlit (Web-based UI):

- A simple web interface where users can enter car details.
- A button to predict the selling price.
- Displays the predicted price along with model evaluation metrics.

(ii) Tkinter (Desktop Application UI):

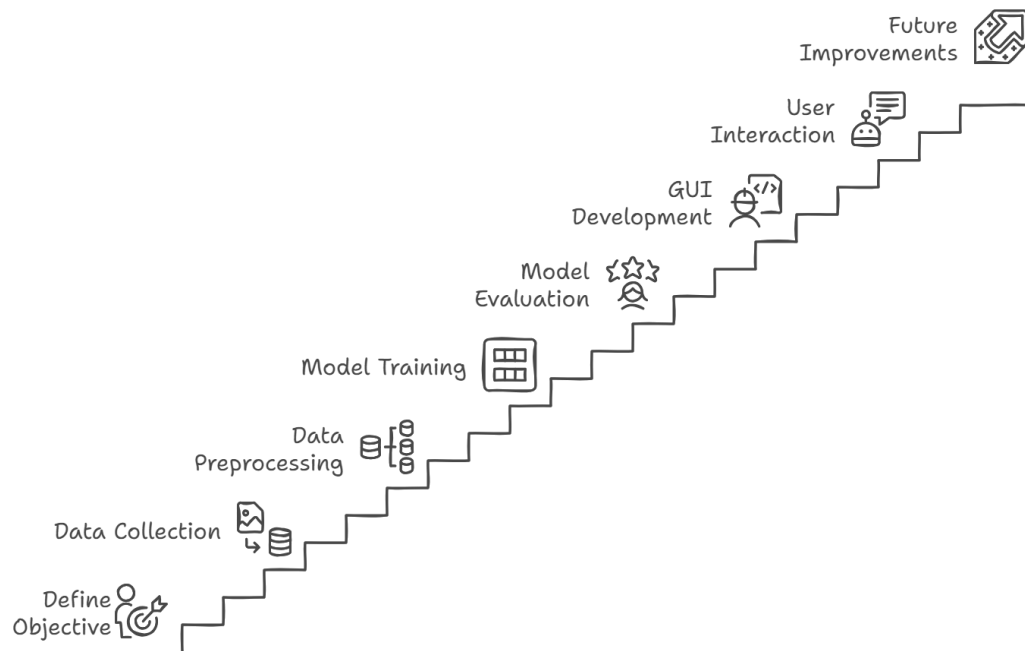
- A graphical desktop application for user interaction.
- Dropdowns and entry fields for input parameters.
- A button to generate the predicted price.
- Displays the prediction result on the interface.

8. Results & Evaluation

- The trained model achieved a reasonable accuracy in predicting car selling prices.
- The Mean Squared Error (MSE) value was calculated to assess model performance.
- Users can estimate their car's selling price conveniently using either the Streamlit or Tkinter application.

9. Conclusion

This project successfully demonstrates the application of machine learning in predicting used car prices. The implementation of two different GUI formats allows users to access the predictions via either a web-based interface (Streamlit) or a standalone desktop application (Tkinter). Future improvements may include using advanced regression models and expanding the dataset for better accuracy.



10. Future Scope

- Enhancing the model with more sophisticated algorithms like Random Forest or XGBoost.
- Adding more features like location, brand, and condition of the car.
- Integrating a database to store user inputs and predictions for further analysis.

11. Code:

- [Streamlit Base Code](#)
- [Tkinter Base Code](#)

12. Outputs:

Car Selling Price Prediction

Year of Manufacture (1990 to 2025):

2005

Present Price (in Lakhs):

1000000

Kilometers Driven:

20

Number of Previous Owners (0, 1, 2, 3):

0

Fuel Type:

☒ Petrol

☐ Diesel

☐ CNG

Seller Type:

☐ Dealer

☒ Individual


Transmission:

☐ Manua

☒ Automatic

Predict Selling Price

Prediction Result

 Estimated Selling Price: Rs.429,151.47 Lakhs

OK

Car Selling Price Prediction

Model Mean Squared Error: 3.48

Year of Manufacture (1990-2025)

2000

- +

Present Price (in Lakhs)

800000.00

- +

Kilometers Driven

10

- +

Number of Previous Owners

1

▼

Fuel Type

☒ Petrol

☐ Diesel

☐ CNG

Seller Type

☐ Dealer

☒ Individual

Transmission

☐ Manual

☒ Automatic

Predict Selling Price

Estimated Selling Price: Rs.343,318.30 Lakhs