Title : Car Price Prediction using Machine Learning

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Introduction:

The objective of this project is to develop a machine learning model that can predict the price of cars based on their features. This report provides an overview of the Python code used for data preprocessing, model training, and prediction.

1. **Data Loading and Preprocessing :**
   - The dataset is loaded using the pandas library and stored in a DataFrame.
   - Irrelevant columns are dropped, and any rows with missing values are removed.
   - The column names are modified for clarity and consistency.
   - The dataset is split into features (X) and the target variable (y).

2. **Linear Regression Model :**
   - A linear regression model is trained using the features (X) and the target variable (y).
   - The model's performance is evaluated using root mean squared error (RMSE).
   - The predictions are generated for the training set.

3. **Random Forest Regression Model :**
   - A random forest regression model is trained using the features (X) and the target variable (y).
   - The model's performance is evaluated using the RMSE.
   - The predictions are generated for the training set.

4. **Model Persistence :**
   - The trained random forest regression model and label encoders are saved using the pickle library for future use.

5. **Gradio Interface :**
    - Gradio is utilized to create a user-friendly interface for the car price prediction model.
    - The interface allows users to input the car's features (year, mileage, car type, model, and transmission) and provides the predicted price as the output.
    - The interface includes sliders, dropdown menus, and descriptive labels for user interaction.
    - Examples with pre-filled inputs are provided to demonstrate the functionality.

Conclusion :

This Python code showcases the process of car price prediction using machine learning techniques. It includes data loading, preprocessing, model training, and prediction using linear regression and random forest regression algorithms.

The generated models can be used to predict car prices based on their features, and the Gradio interface provides a user-friendly way to interact with the trained model. Overall, this code serves as a practical solution for car price prediction tasks.