

Advanced Car Price Forecasting with Deep Learning (ANN)

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Introduction

This document outlines the process of predicting car prices using advanced data science techniques and artificial neural networks (ANN). The goal is to predict car prices based on features such as mileage, fuel type, brand, and year. We use ANN models for accurate predictions, allowing informed decisions.

Libraries Used

The following Python libraries were used in this project:

- NumPy: For numerical computations
- Pandas: For data manipulation and analysis
- Matplotlib: For data visualization
- Seaborn: For statistical data visualization
- Scikit-learn: For model training and evaluation
- TensorFlow (Keras): For building and training the ANN model

Dataset Description

The dataset contains various features of cars, including the year of manufacture, selling price, current price, kilometers driven, and other attributes such as fuel type, seller type, and transmission type. This data is used to train the ANN model to predict the selling price of cars.

Sample Data

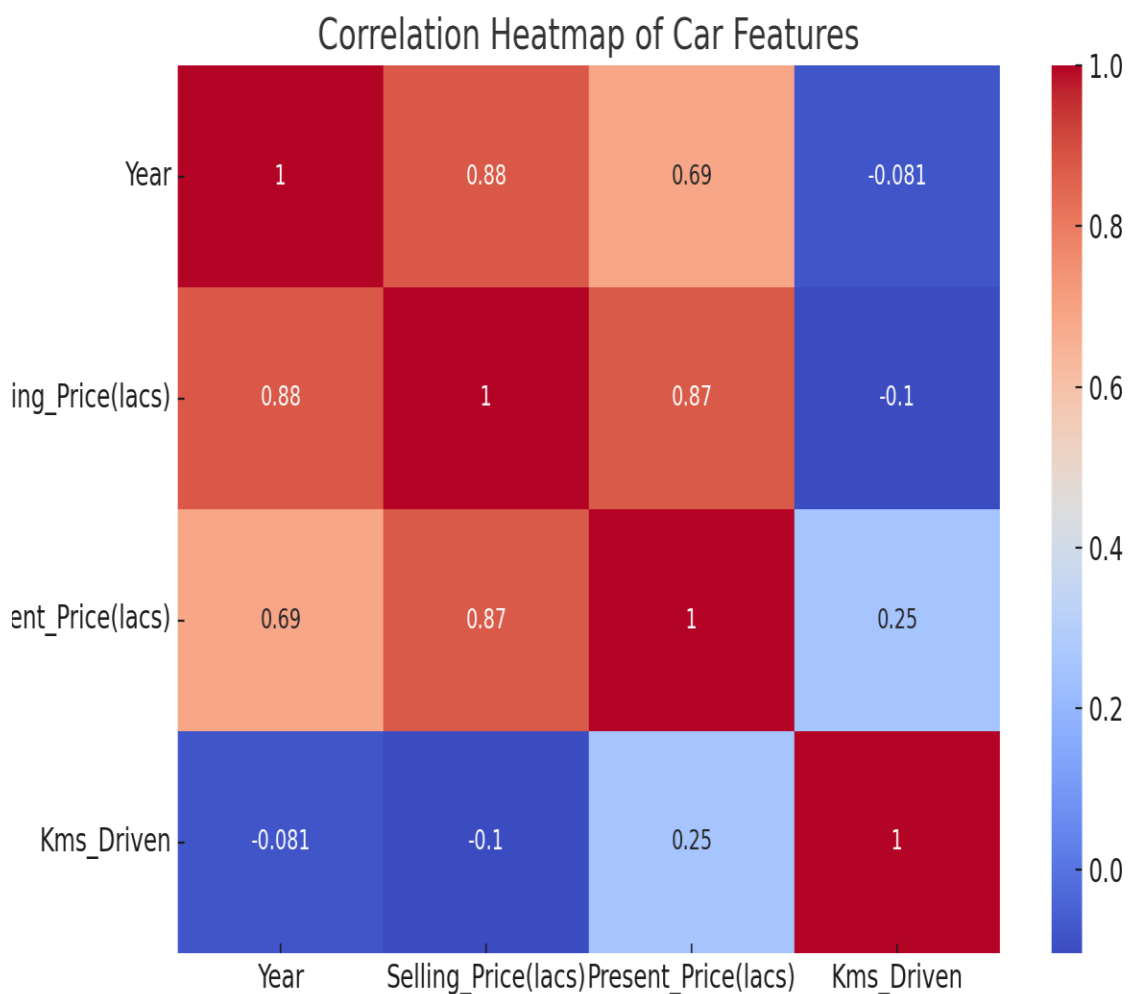
Car_Name	Year	Selling_Price(lacs)	Present_Price(lacs)	Kms_Driven	Fuel_Type
ritz	2014	3.35	5.59	27000	Petrol
sx4	2013	4.75	9.54	43000	Diesel
ciaz	2017	7.25	9.85	6900	Petrol

wagon r	2011	2.85	4.15	5200	Petrol
swift	2014	4.6	6.87	42450	Diesel

Step 1: Data Exploration and Visualization

The dataset was loaded and analyzed to identify key features. Visualizations such as heatmaps and distribution plots were created to explore relationships between features.

The following graph shows the correlation between different car features:

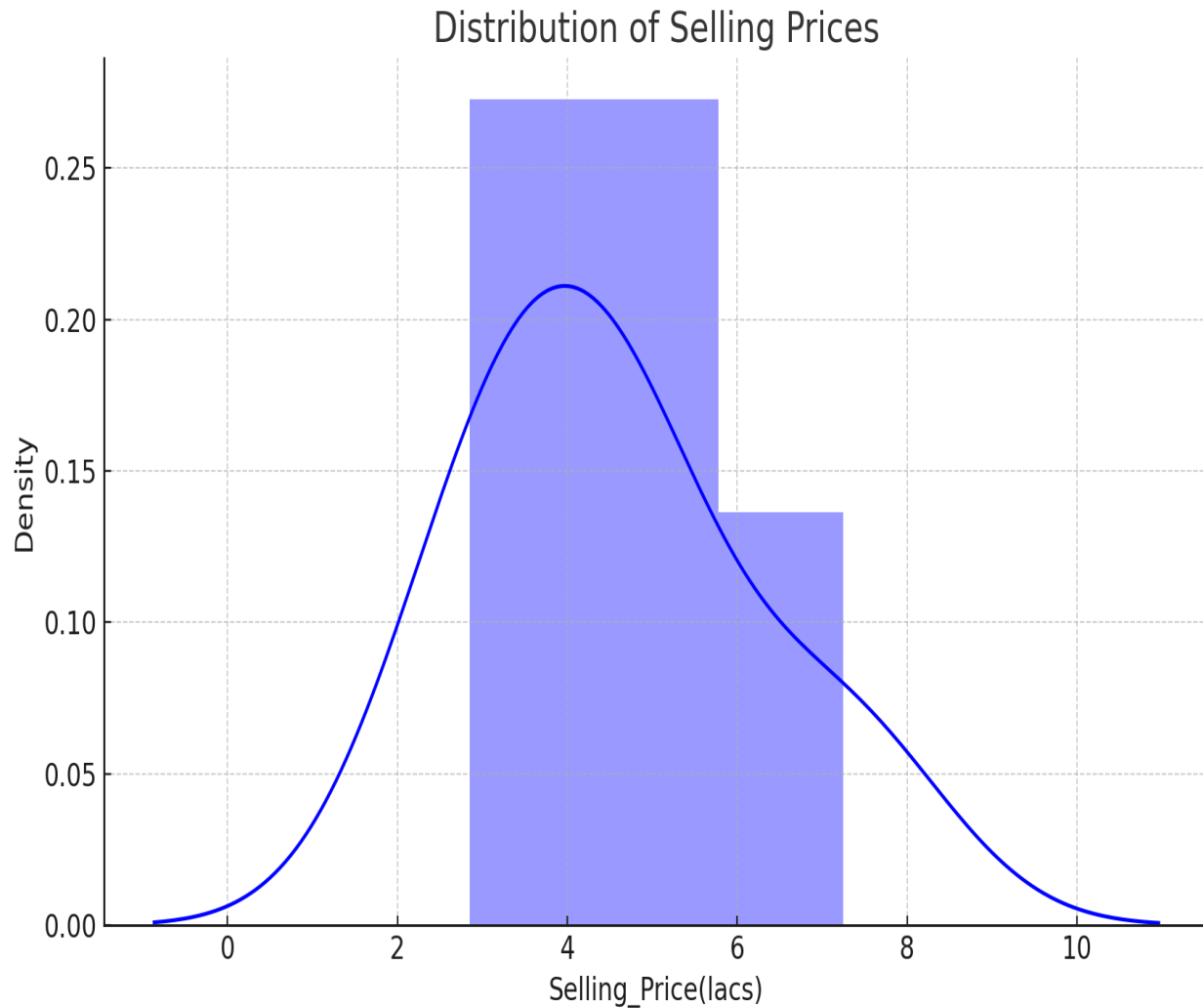


Correlation Heatmap

The heatmap visualizes the correlation between different car features. For example, the selling price has a strong positive correlation with the present price, indicating that cars

with higher current prices tend to have higher selling prices. This insight is crucial for building an accurate prediction model.

The following graph shows the distribution of selling prices:



Distribution of Selling Prices

The distribution of selling prices shows that the majority of cars are sold in the lower price range. However, there are some high-priced cars which could be outliers or luxury vehicles. Understanding the distribution helps in identifying pricing trends in the dataset.

Conclusion

The Car Price Forecasting project utilizes Artificial Neural Networks to accurately predict car prices. By analyzing features such as present price, kilometers driven, and fuel type, the model provides reliable insights into pricing trends.

Future Scope

1. **Model Improvement**: Advanced hyperparameter tuning and deeper neural networks could improve prediction accuracy.
2. **External Factors**: Incorporating external factors such as market demand, brand reputation, and economic conditions could enhance model performance.
3. **Real-Time Predictions**: The model could be deployed to provide real-time price predictions for car listings online.