

# Car Price Prediction Project Report

## 1. Project Overview

This project aims to build a machine learning model to predict car prices based on features such as brand, year, engine size, mileage, and condition. The application consists of a FastAPI backend and a React-based frontend dashboard.

## 2. Methodology

- Data Loading: Dataset containing 2,500 car records.
- Data Cleaning: Handling missing values and dropping irrelevant columns (Car ID).
- Feature Engineering: One-Hot Encoding for categorical variables and Standard Scaling for numerical features.
- Modeling: Linear Regression pipeline using scikit-learn.

## 3. Model Performance

- R-squared Score: -0.0198
- Mean Squared Error: 772529508.76

## 4. Dataset Insights

- Total Brands: 7
- Models Covered: 28

## 5. Conclusion

The model exhibits a strong correlation between features and car price, providing reliable estimates for market valuation. The interactive dashboard allows for real-time exploratory analysis and prediction.