An Examination of Factors in Used Car Pricing

What drives the price of a car?



# Overview

In this application, the client is a used car dealership looking to maximize sales. Using a dataset on used cars and machine learning, factors that make a car more or less expensive are identified. As a result of this analysis, clear recommendations to the client, a used car dealership, is provided as to what consumers value in a used car.

The dealership needs a clear set of recommendations on the key features that drive used car pricing, enabling them to fine-tune their purchasing decisions and maintain inventory aligned with consumer preference. Using a dataset on used cars, statistical and machine learning models are used to determine which features contribute most to a car’s resale value.

# Executive Summary

Machine learning techniques were used to determine which features contribute most to a car’s resale value.

* The dealership group's market positioning and business constraints were considered in the evaluation:
* The dealer is not interested in keeping cars of extremely high value (over $100,000) on the lot
* The dealer preferes to sell cars under 1,000,000 miles to avoid time consuming questions during the sales cycle
* The dealer is not equipped to sell non-mass market cars such as those that are very old (25 years) or very rare

Various computer models were evaluated based on their ability to accurately predict the price of the car. Data up to the year 2020 was used to evaluate the models. The selected model provided the following insight into what drives the price of a car.

| **Top Factors That Drove High Prices**   * Fuel: Diesel * Type: Truck * Cylinders: 8 Cylinders * Drive: 4wd * Manufacturer: Toyota * Type: Pickup * Transmission: Manual * Title: Status: Clean * Manufacturer: Ram * Recent Model Year * Manufacturer: GMC * State: CA * Manufacturer: Honda * Type: Convertible * State: NC * Type: Coupe * Cylinders: 6 Cylinders * Manufacturer: Lexus * Condition: Like New * Cylinders: 10 Cylinders | **Top Factors that Drive Low Prices**   * Fuel: Gas * Cylinders: 4 Cylinders * Type: Sedan * Drive: Fwd * Type: SUV * Manufacturer: Nissan * Transmission: Automatic * Type: Hatchback * Manufacturer: Dodge * Manufacturer: Subaru * Title: Status: Rebuilt |
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The complete list of sorted factors in priority order is available for download here:

<https://github.com/im360wayne/AI-ML-UsedCarPricing/blob/main/factors_that_drive_price_sorted.csv>

**Action Items and Next Steps**

1. The dealer should review the sorted factors list and purchase cars with these attributes.
2. As the recommendations are only as good as the data used, the dealer group continuously should provide updated sales data for re-evaluation.

# Technical Analysis

A technical analysis and detailed report can be found here:

<https://github.com/im360wayne/AI-ML-UsedCarPricing/blob/main/UsedCarPricing.ipynb>

GitHub Repository Here:

<https://github.com/im360wayne/AI-ML-UsedCarPricing>