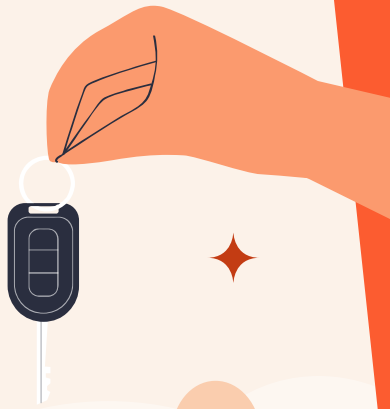
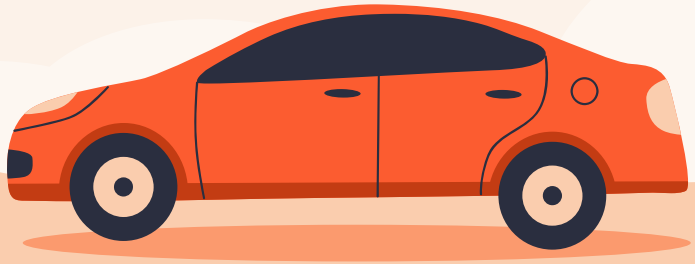
MarketMaster:

Predicting your Car's Sale Price

Rafi Rahman





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Problem Statement

- Determining a fair market value of a used car can be a challenging task for individuals, often relying on subjective methods such as online guides or dealer estimates.
- These methods lack the ability to comprehensively assess the unique features and market conditions that influence a car's worth, leading to potential financial losses for sellers who underestimate their vehicle's true value.
- By leveraging vehicle catalogs from multiple sources, to reduce bias and capture a wider range of market variations.

MotorPoint

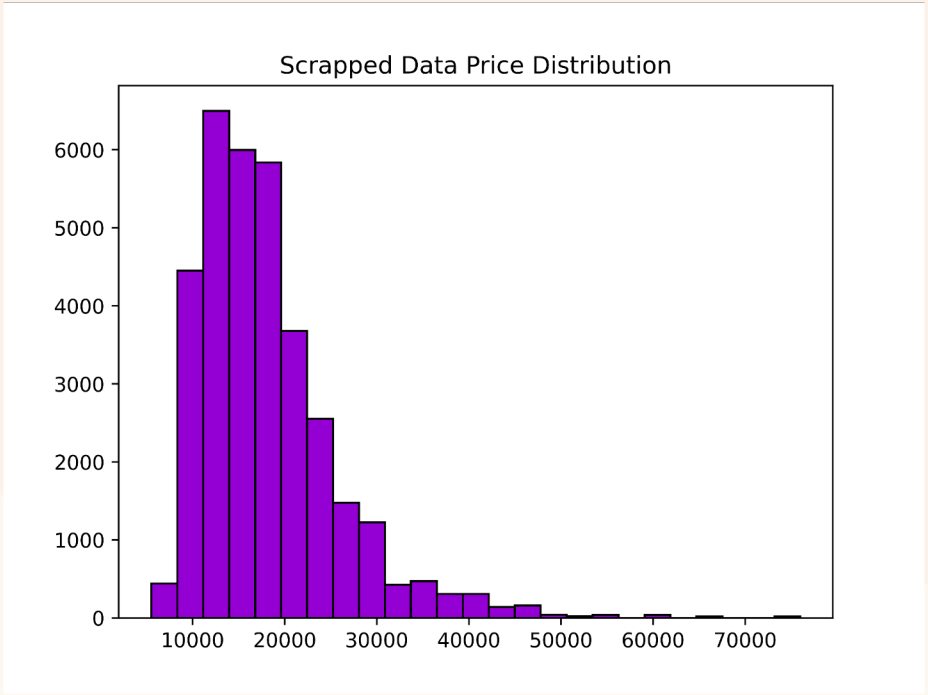
BuyaCar

Cazoo

Background

- $117.1 Billion recorded in the UK, expected to reach $226.16 Billion by 2027
- 2020-2022 Silicon Shortage
- Introduction of ULEZ (Ultra Low-Emission Zones)
- Around 40% increase in Car insurance
- Online Car Sales
- Different market ups

Data Analysis

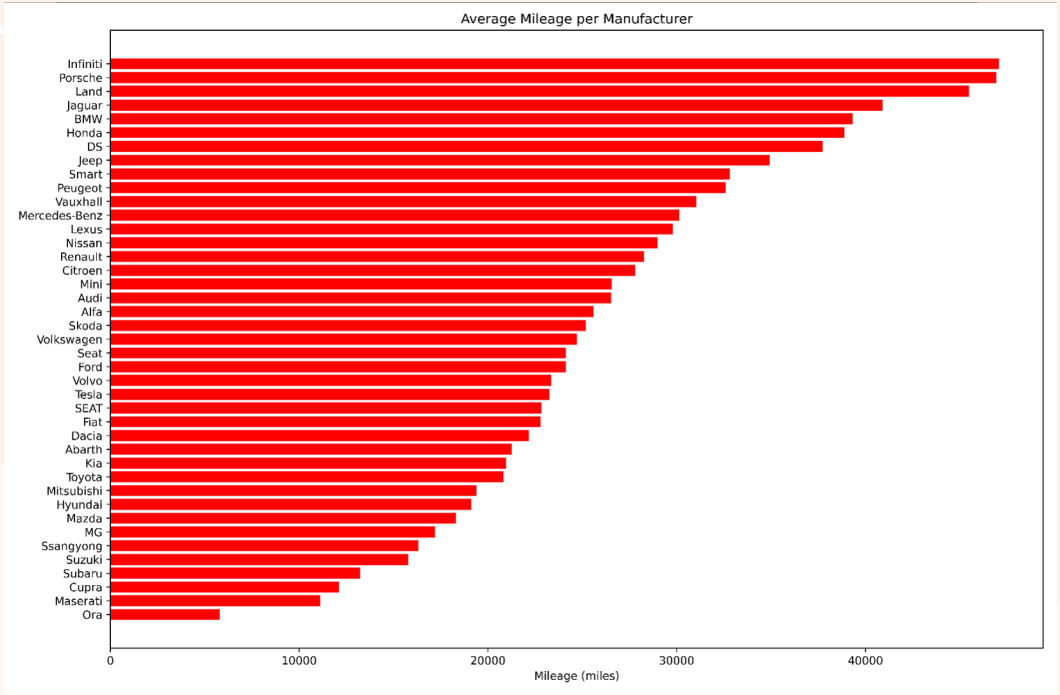


Price Range

Average Mileage

Mileage v Price

Data Analysis



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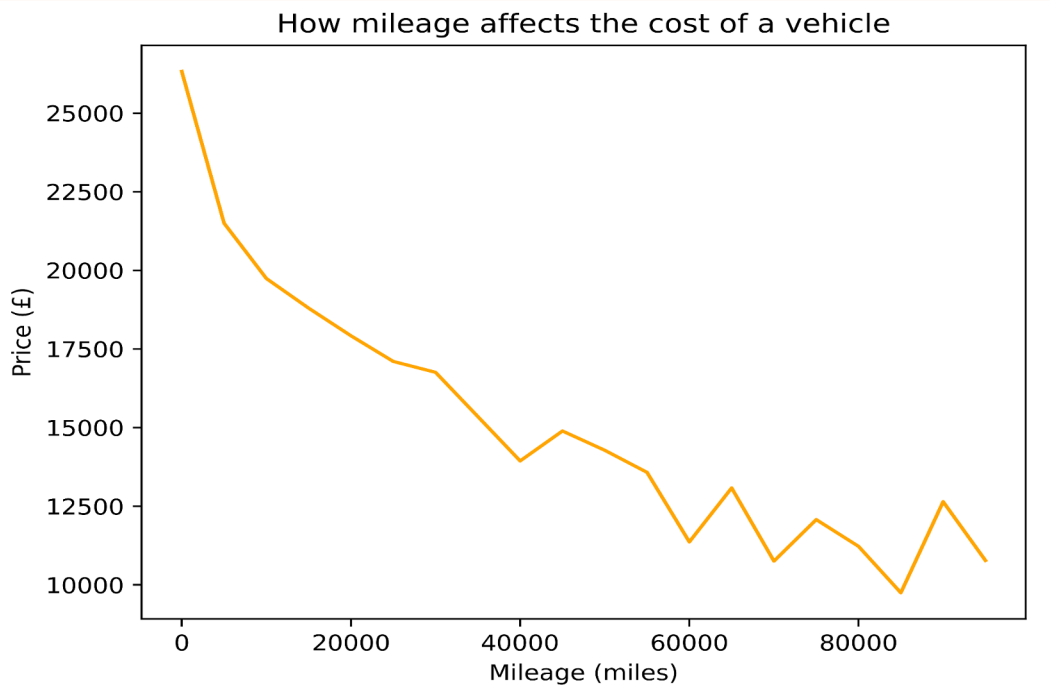

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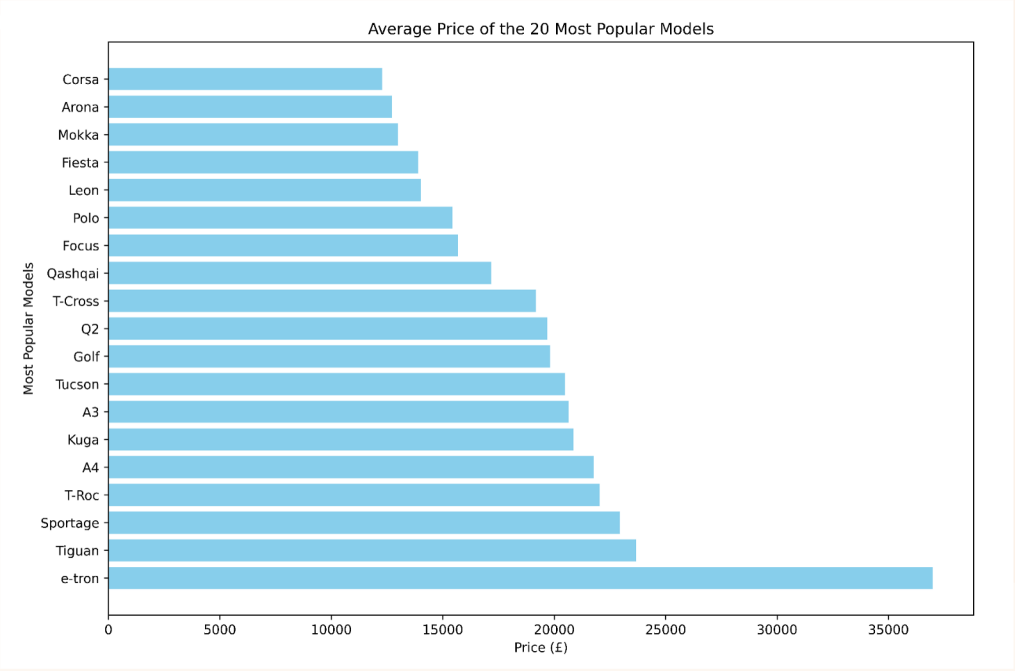
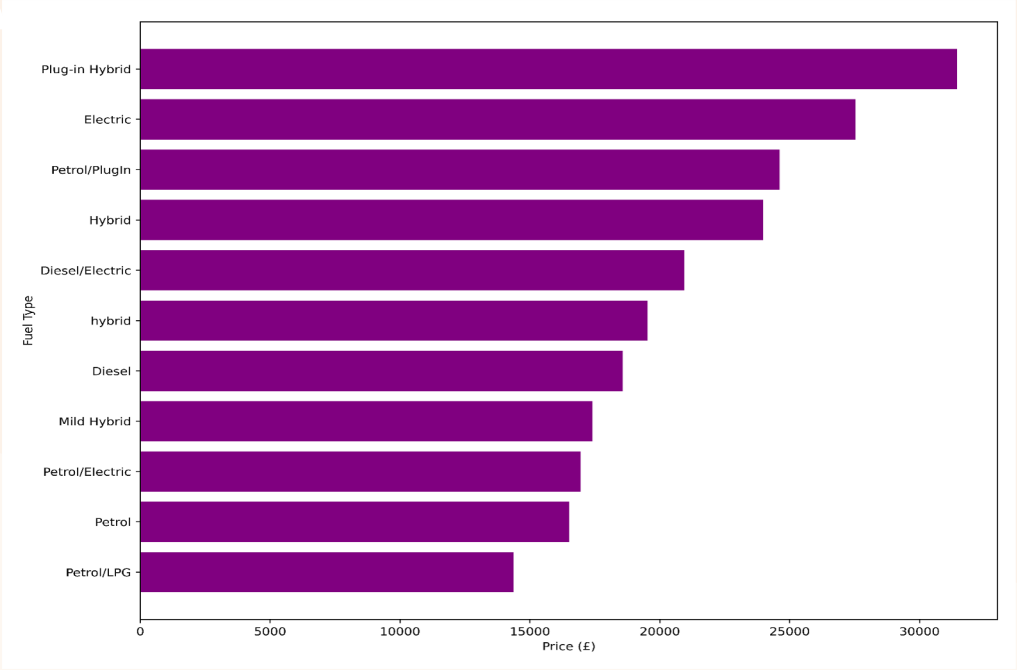


Most Popular Models

Fuel type v Price

Gearbox v Price

Data Analysis



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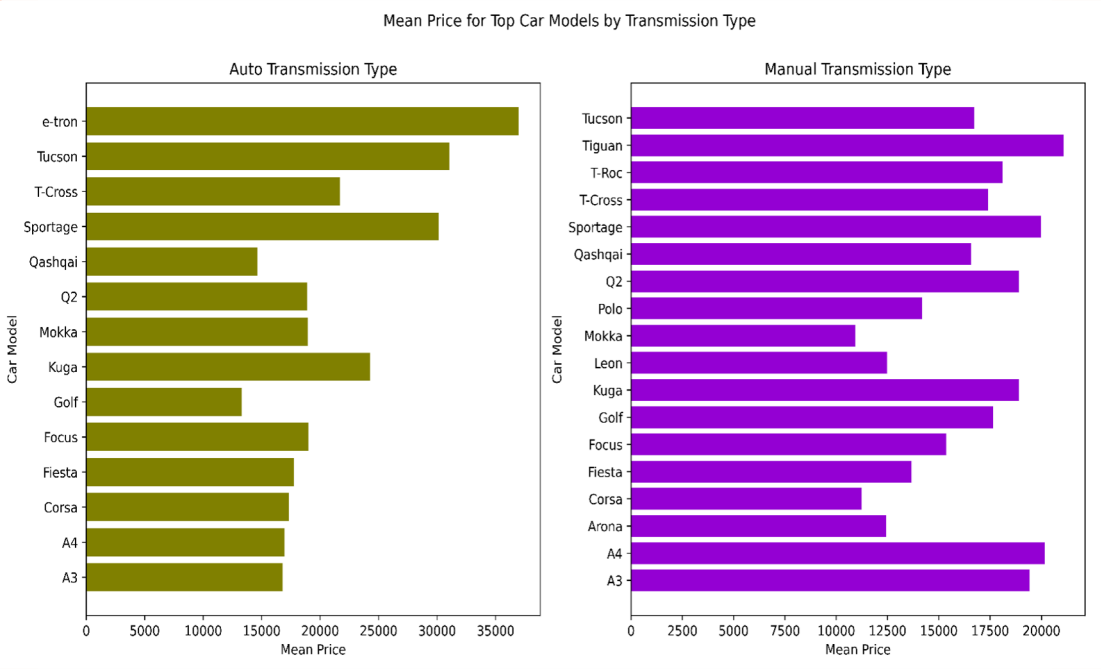


Most Popular Models

Fuel type v Price

Gearbox v Price

Modelling

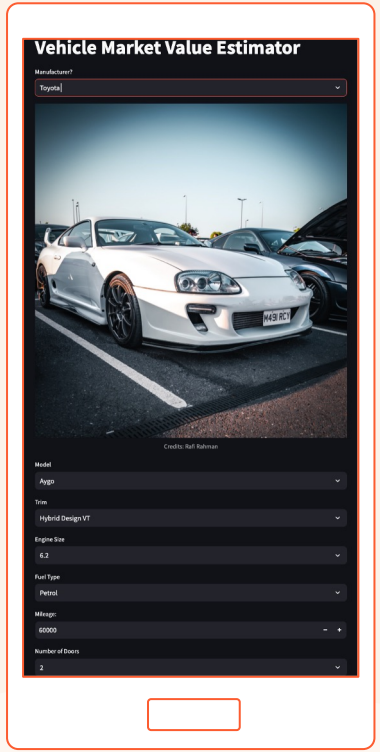
Preprocessing

- CountVectorizer on Vehicle Trim
- OneHotEncoder on Make, Model, Gearbox type and Fuel Type

Regression vs Tree

- Tree model was able to capture the more complex patterns and interactions
- Production Model

Model	R2 (Train)	R2 (Test)	Mean Absolute Error
Linear Regression	0.9523	-520534691.8276	5570858.61720
Decision Tree	0.9999	0.9829	211.0330
Extra Trees	0.9999	0.9921	136.8079


Vehicle Market Value Estimator
Manufacturer?
Toyota
Credits: Rafi Rahman
Model
Aygo
Trim
Hybrid Design VT
Engine Size
6.2
Fuel Type
Petrol
Mileage:
60000
Number of Doors
2

Streamlit

Conclusion & Recommendations

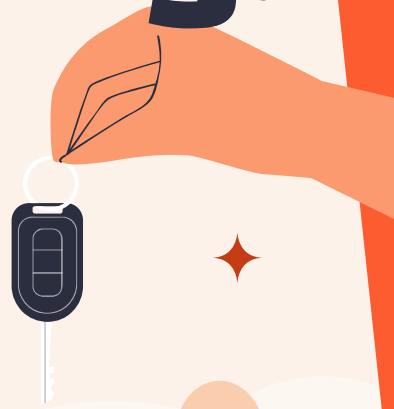
- Developed a machine learning model for predicting used car prices using data from multiple sources to reduce bias and capture wider market variations.
- Employed an ExtraTrees Model, a tree-based ensemble method, due to its superior performance compared to a Linear Regression model.
- Implemented the model into a Streamlit web application for easy user input and real-time price predictions.
- Achieved a mean absolute error (MAE) of 136.8079 and an R-squared score of 99.21%, demonstrating the model's accuracy in car price predictions.

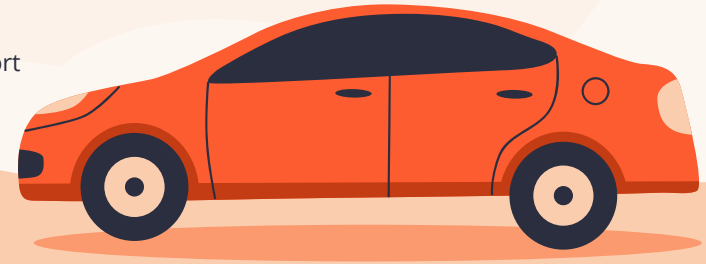
Future directions include:

- Incorporating additional data sources to increase the model's training data and capture more market trends.
- Investigating complex machine learning algorithms, such as deep learning, to improve accuracy and performance for rare or unique car models.
- Creating a mobile application for convenient, on-the-go car price predictions.

Thanks for listening!

Do you have any questions?





Citations:

1) Slide template - https://slidesgo.com/
2) Mordor Intelligence - https://mordorintelligence.com/industry-reports/unitedkingdom-used-car-market
3) Pudaruth, S. (2014). A comparative study of machine learning algorithms in used car price prediction. Journal of Applied Mathematics, 2014, 1-11.
4) Samruddhi, M., & Kumar, A. (2020). Used Cars Price Prediction and Valuation using Data Mining Techniques. RIT Scholar Works, Rochester Institute of Technology.

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