



Resale Car Price Prediction in Singapore

Capstone Project (12Mar2022)

[DS-SG-FT-6Dec2021]

by Derek Tan



Agenda

- Biography
- About sgCarMart
- Business Problem
- Business Proposal
- Introduce the dataset
- Exploratory Data Analysis
- Model
- Model Evaluation
- Conclusion
- Future Work
- Deployment



Biography

- Name: Derek Tan
- Studied: Diploma in Business Administration and Certificate in Data Science and Ai from IOD
- <https://www.linkedin.com/in/derektansw/>



SGCARMART

About
SgCarMart

About SgCarMart

- Singapore's most Popular car buying and selling website with over **10,000** car listings.





About SgCarMart

- Offers the largest database of new and used cars for sale with at least **10 cars** sold **every hour** and helps account for approximately 70% of all used car transactions in Singapore.





About SgCarMart

- Site reaches **4.2M users** monthly, making it the top-ranked automotive website with more than **80 times** the engagement compared to its competitors

About SgCarMart

- More than **120,000** highly engaged followers across Facebook, Instagram, and YouTube.





How do car owners sell on sgCarmart?

3 Ways to sell on sgCarMart

- Post an Ad – pay \$68 and List till sold! Free paperwork support
- Sell by Bidding – Let 500+ Dealers Bid your car, no obligations to sell
- Consignment – Let Agents Handle Everything for you at your selling Price.



New Cars

Used Cars

Rental Cars

Sell My Car

Directory

Products

Insurance

Articles

Forum

Resources

6,799
cars sold last month

How would you like to sell your car?

POST AN AD

Sell it Yourself

- Advertise at just \$68 until it's SOLD!
- Free paperwork support by sgCarMart Connect for both seller & buyer.

[Post My Ad](#)[Advertiser's Login](#)

SELL BY BIDDING

Auction to 500+ Dealers

- Let 500+ dealers bid for your car with no obligations to sell.
- Get cash immediately, handover car after 1 month.

[Get Bids Now](#)[Live Bidding](#)

CONSIGNMENT

Get Help to Sell Directly

- Sell to direct buyers at the price you want!
- Agents advertise, negotiate & handle all paperwork for you.

[Contact an Agent](#)[List of Consignment Cars](#)



Business Problem

sgCarMart Connect for both seller & buyer.

Post My Ad

[Advertiser's Login](#)

- Get cash immediately, handover car after 1 month.

Get Bids Now

[Live Bidding](#)

- Agents advertise, negotiate & handle all paperwork for you.

Contact an Agent

[List of Consignment Cars](#)

Free Valuation

*Let us tell you how much your car can sell for.
All done via phone/online. No obligations. Free.*

How much is my car worth?





Most owners are surprised at how much more their car can fetch!

Get a Free Quote Now

Why sgCarMart Quotz



We help you find the true value of your car



We are the best car selling platform in Singapore

Get your Free Valuation

We will contact you within 1 working day.

Your Name

Contact Number

Vehicle Plate Number

Singapore NRIC (e.g. S1234567D) ▼

Owner's ID (last 4 characters e.g. 456D)

Email

☒ I agree for Quotz & sgCarMart to contact me on matters related to my vehicle. Your information is safe with us. [Learn more about our Privacy Policy.](#)

Submit Details

Business Proposal






Business Proposal

Build a model that predicts the resale price of car in Singapore



Benefits

To complement the company's research materials for keeping sellers engaged, provide insights, to support seller's decision-making potential applications to sell their cars



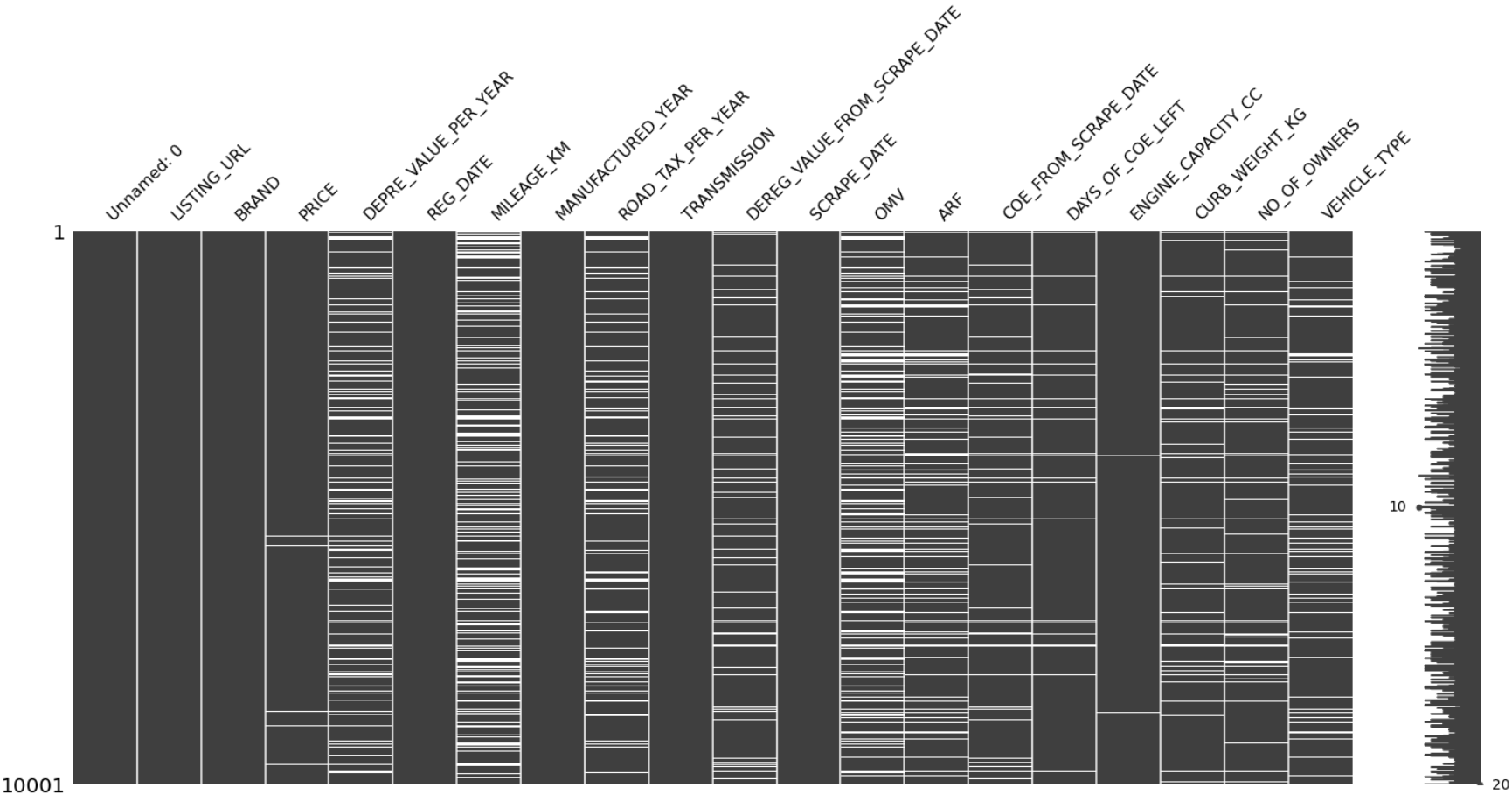


Introduce the Dataset

How the data was collected?

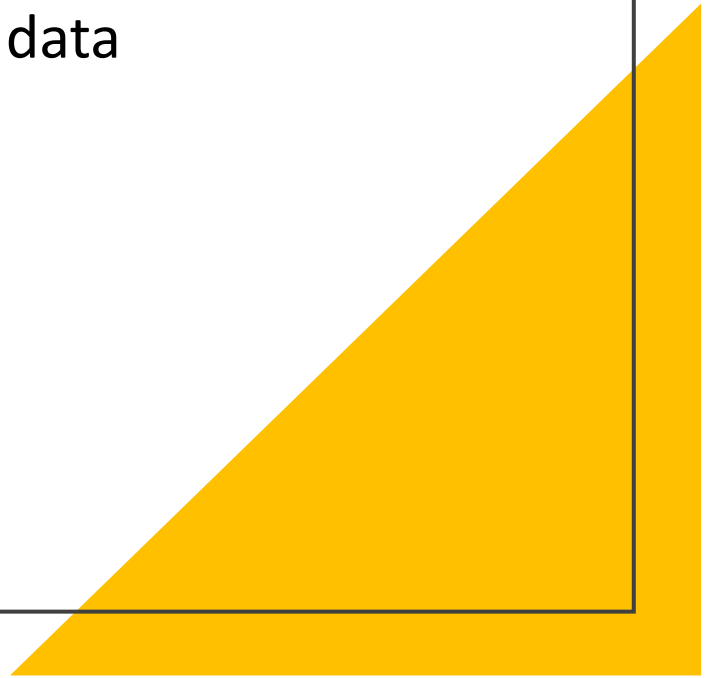
The Data was collected on the sgCarMart website by web scraping using beautiful soup

Steps to Data Cleaning



Steps to Data Cleaning

- Drop all null values as there are no meaningful ways to forward fill, backfill, or mean because almost half of the data is missing.



After preprocessing and
cleaning

We have a total of

5318 data

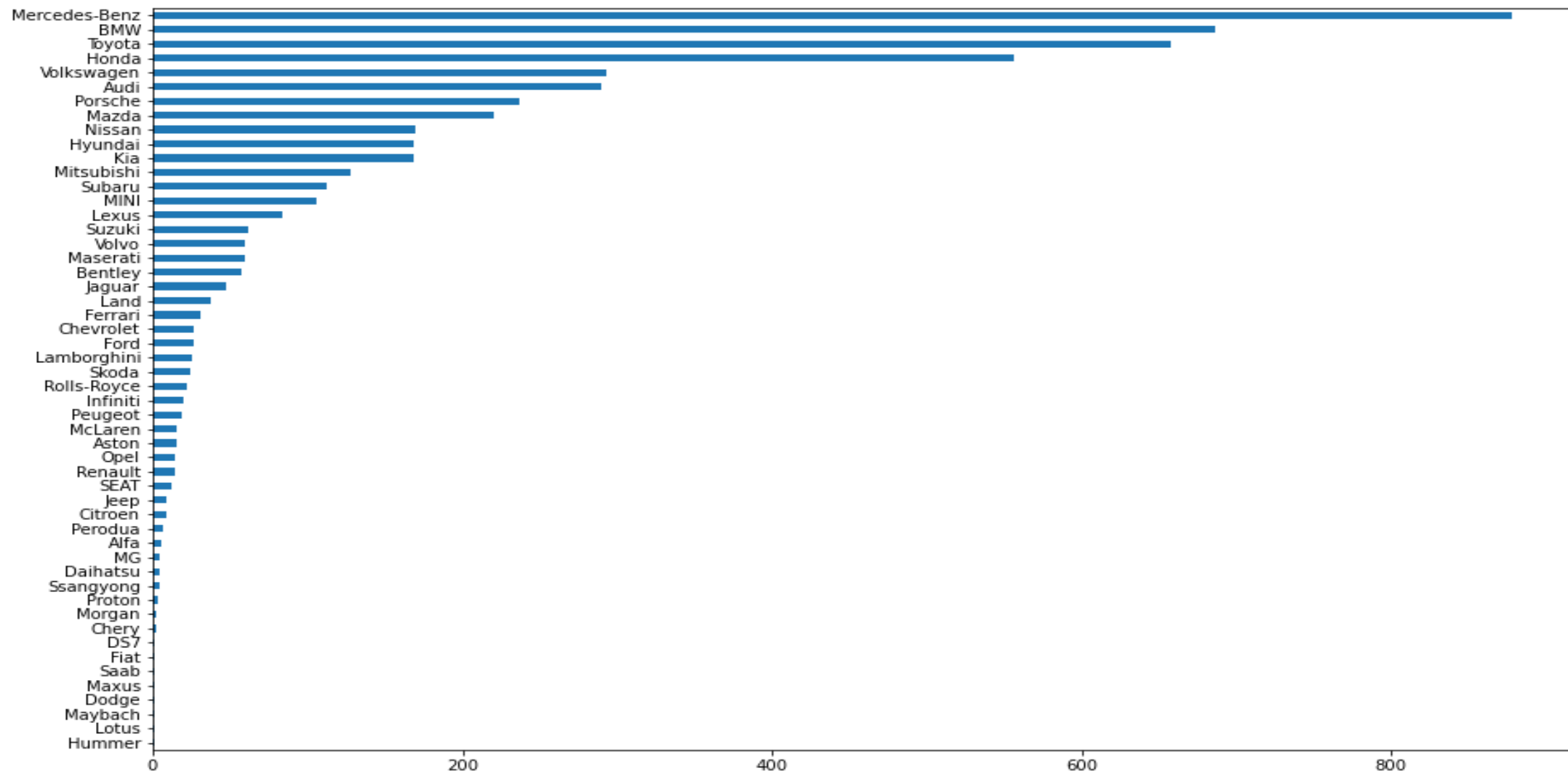
to analyze and build the model



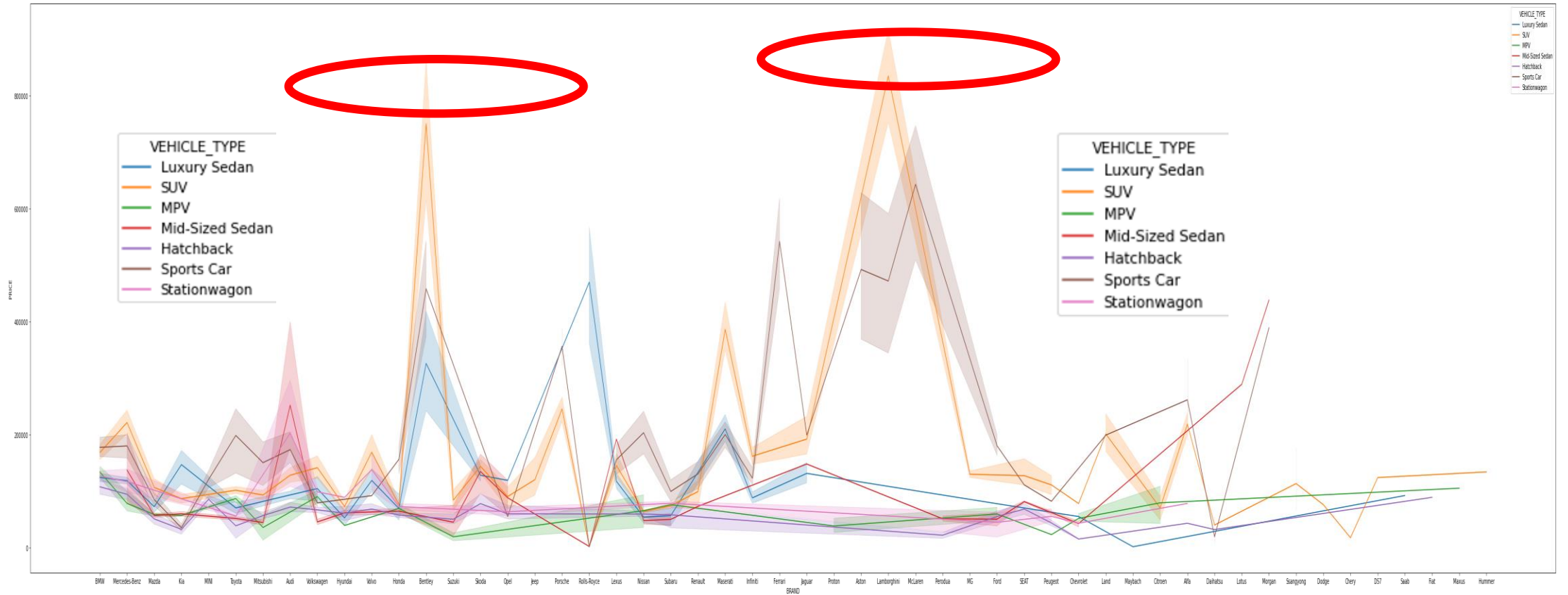
Exploratory Data Analysis



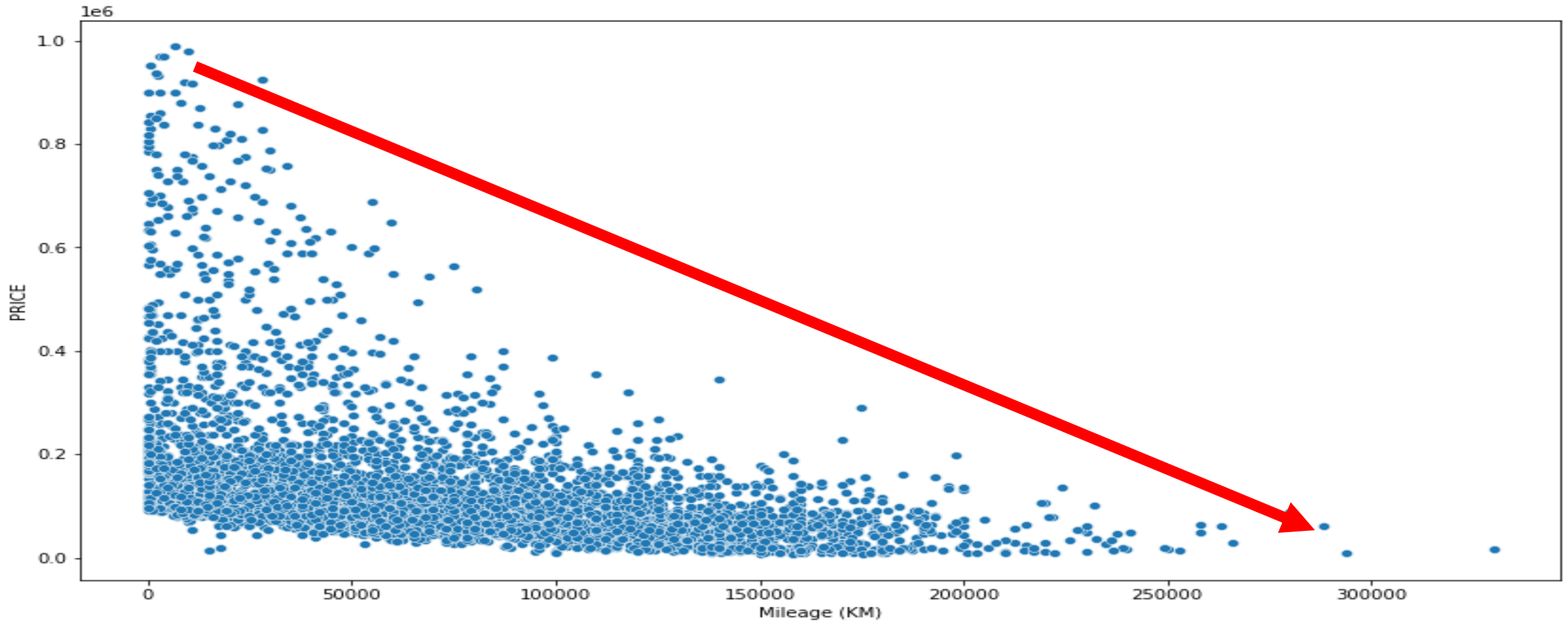
Brand



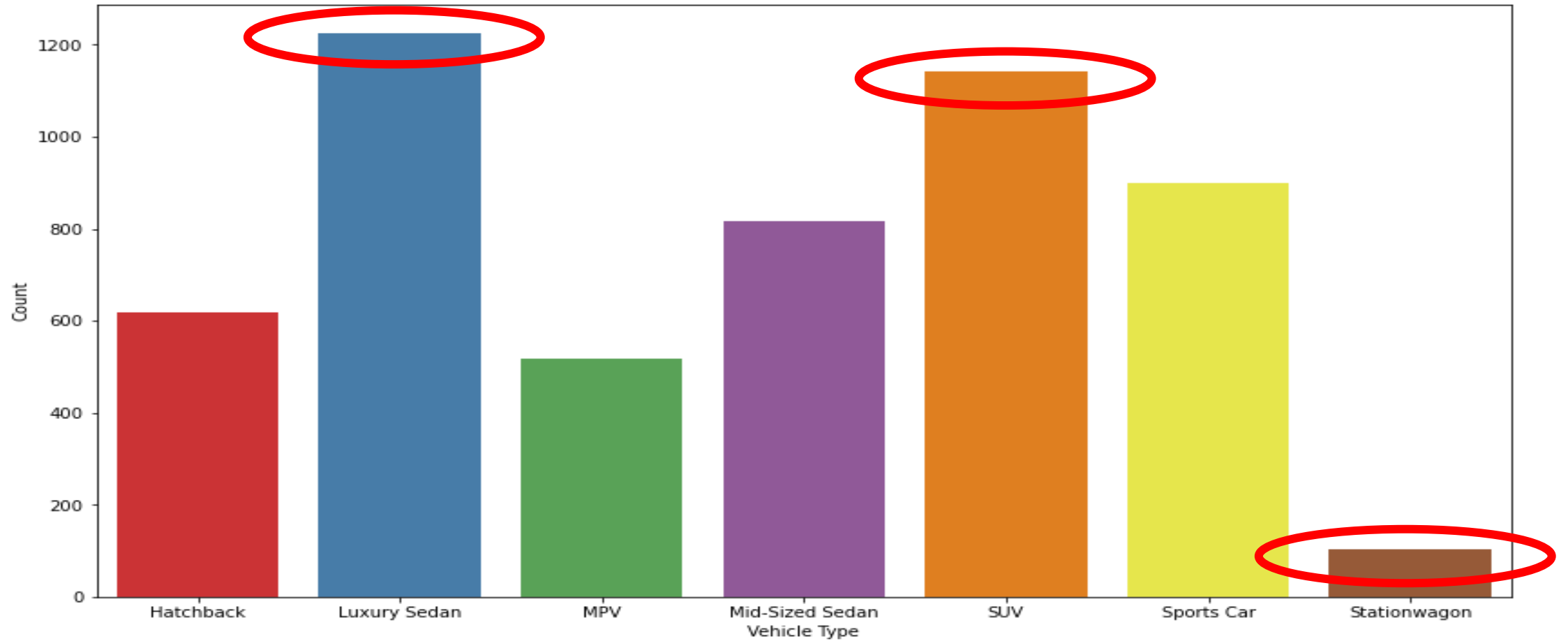
Brand vs Price



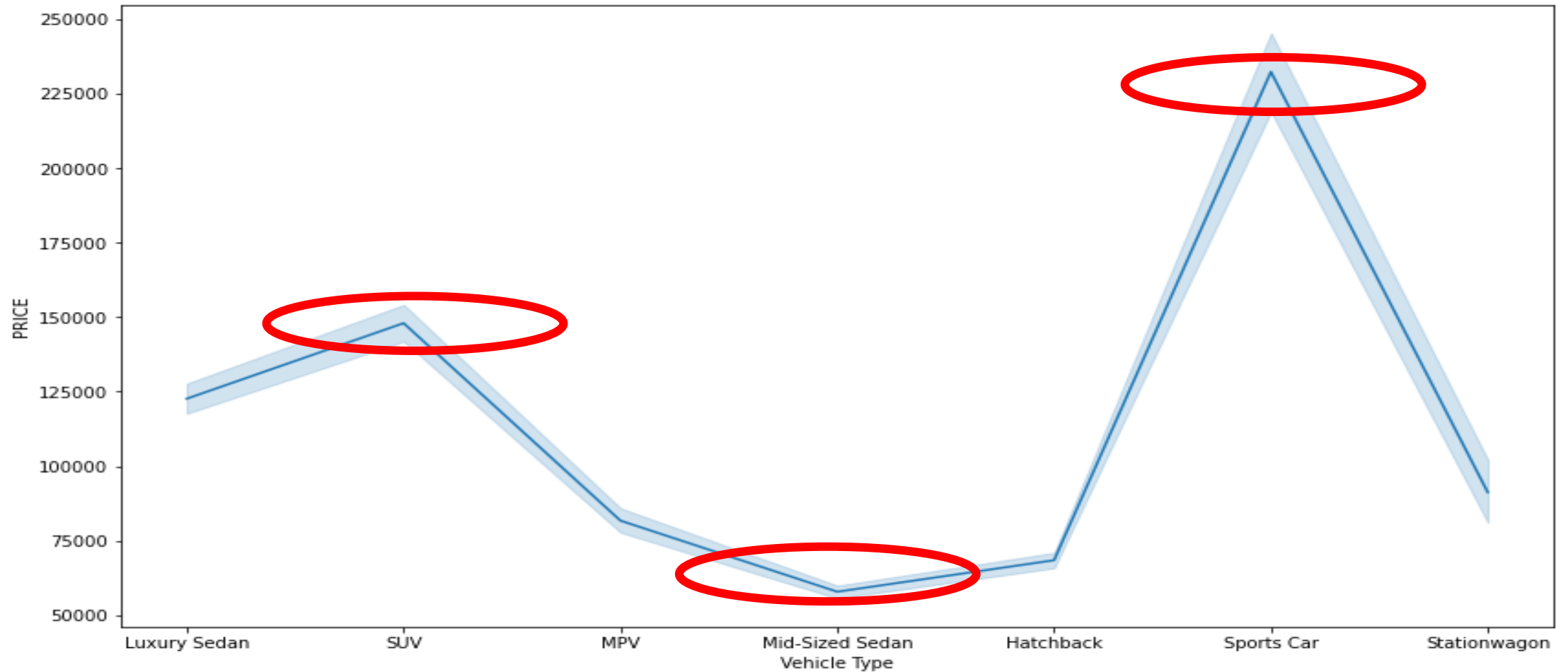
Mileage (KM) Vs Price



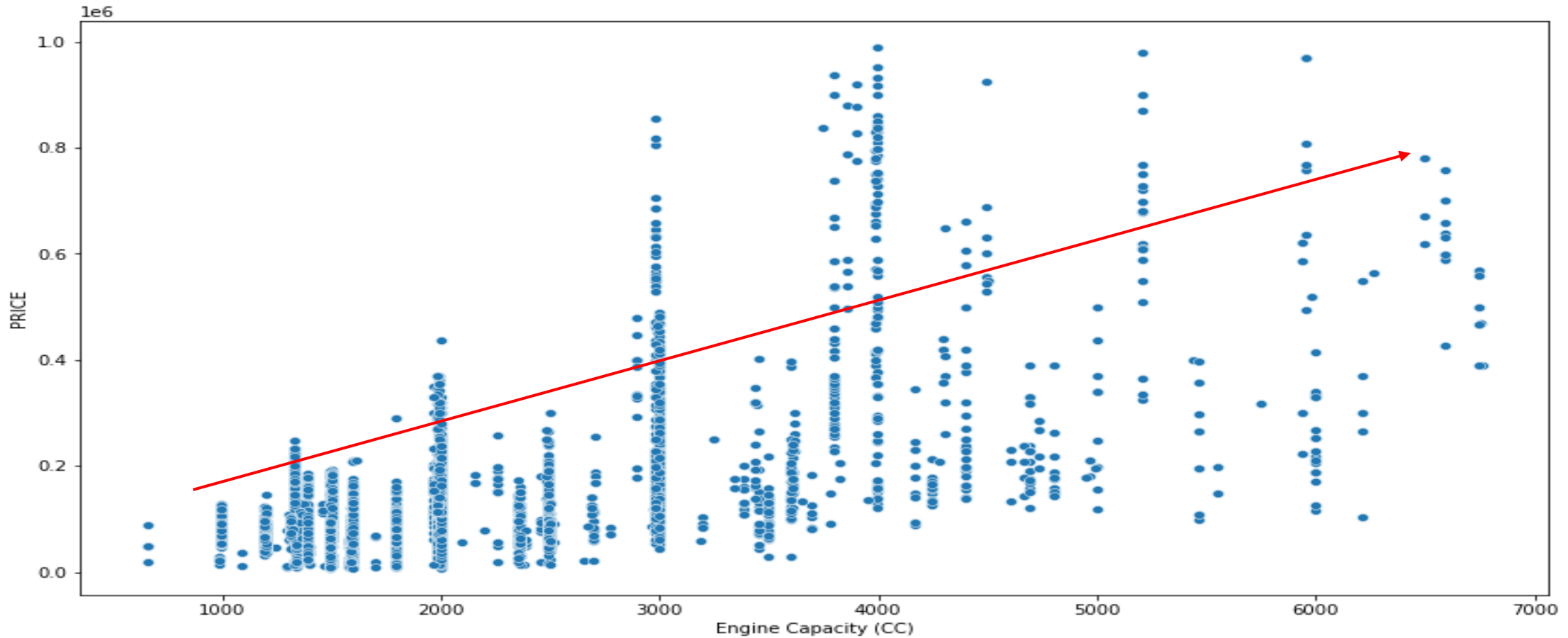
Vehicle Type



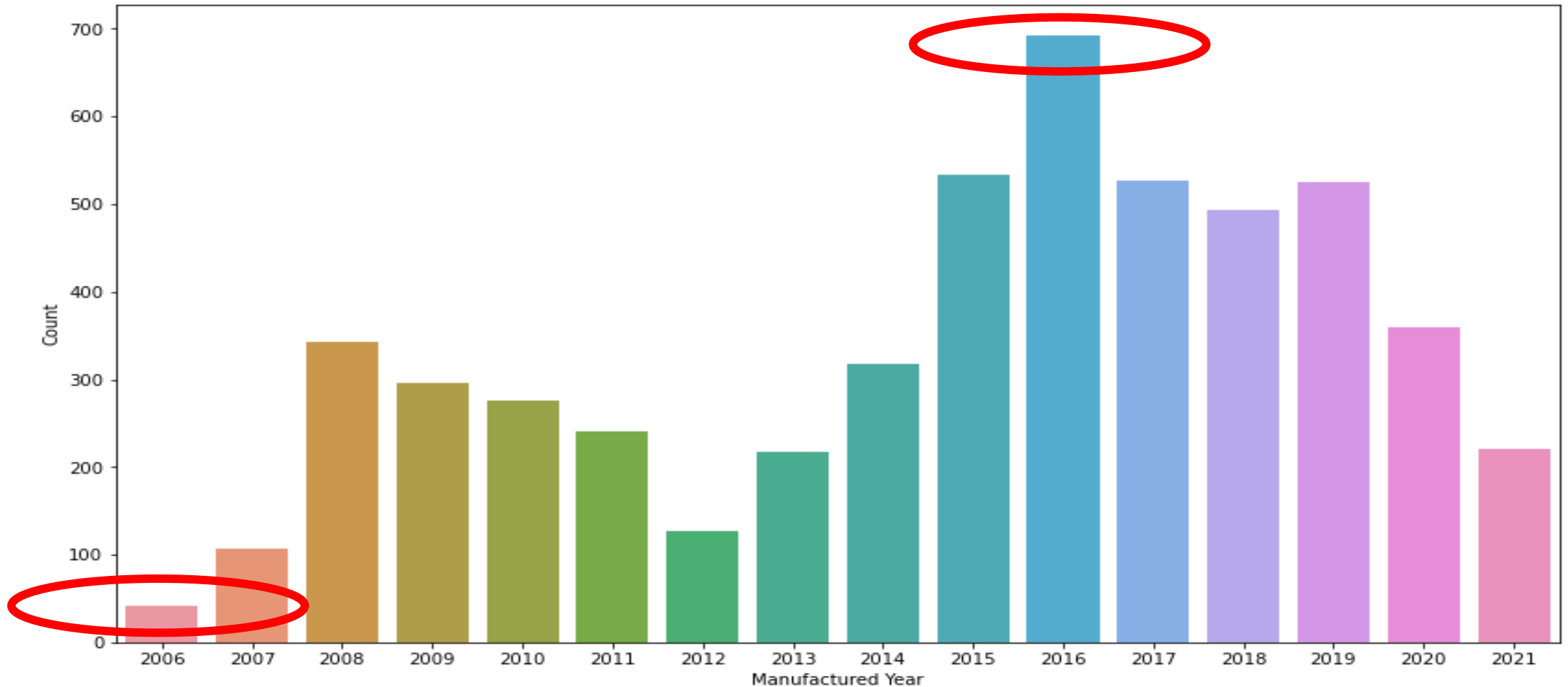
Vehicle type Vs Price



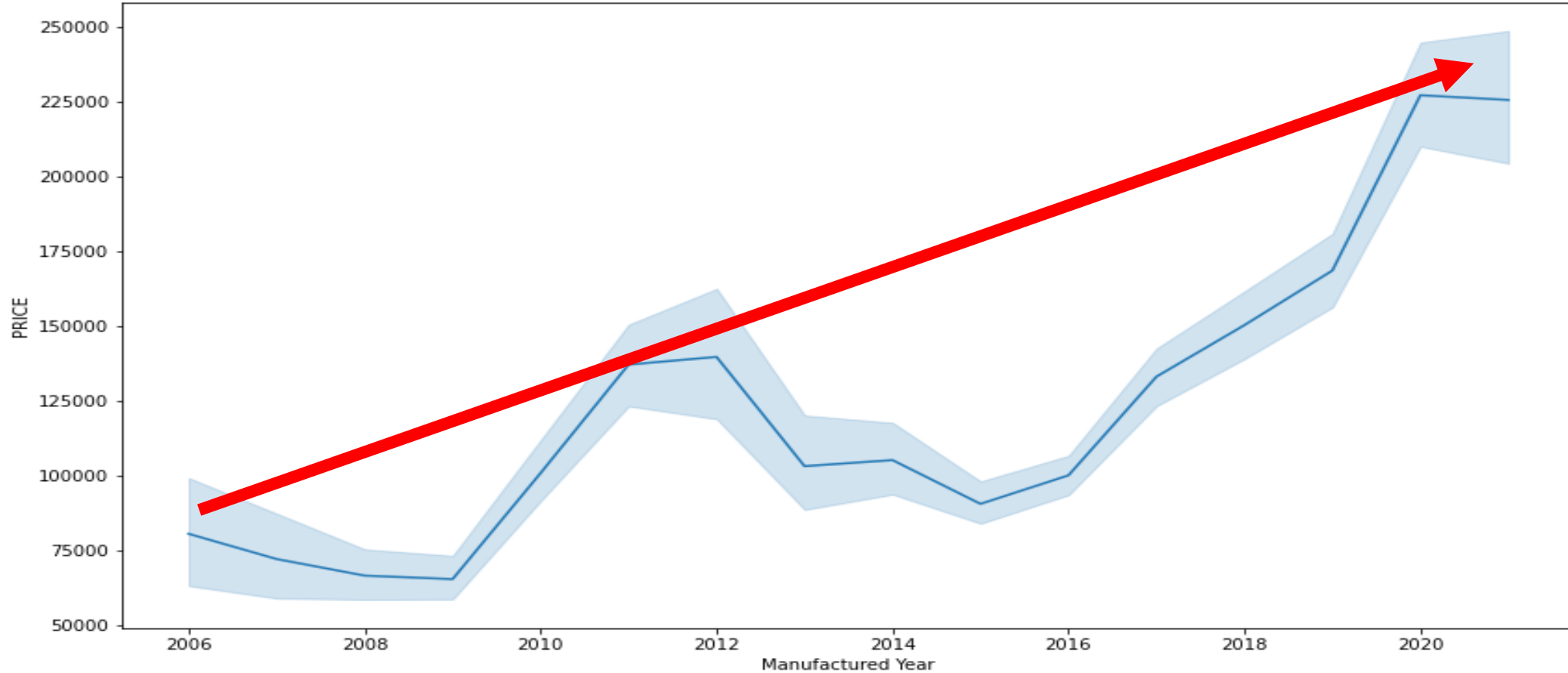
Engine Capacity vs Price



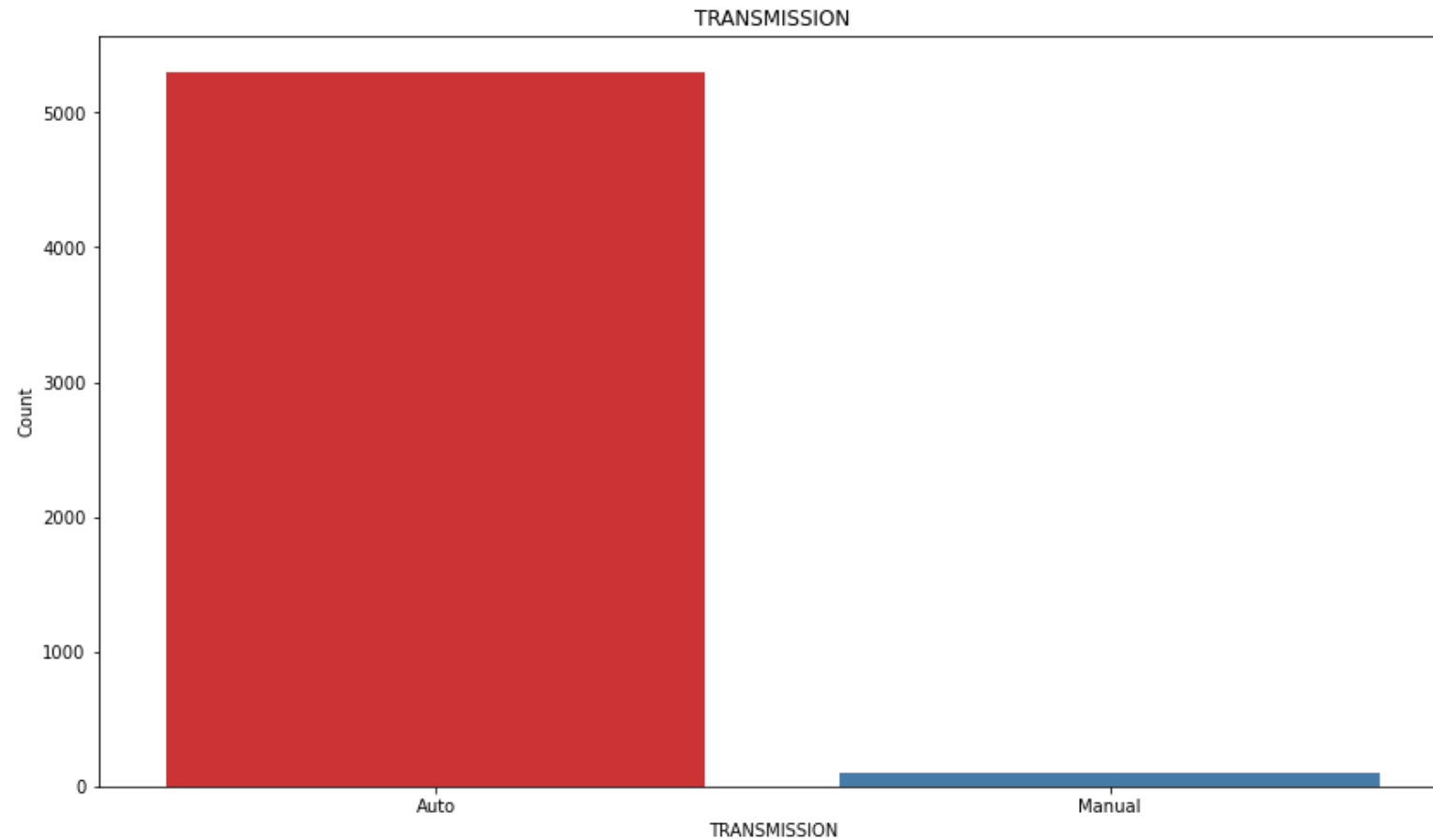
Manufactured

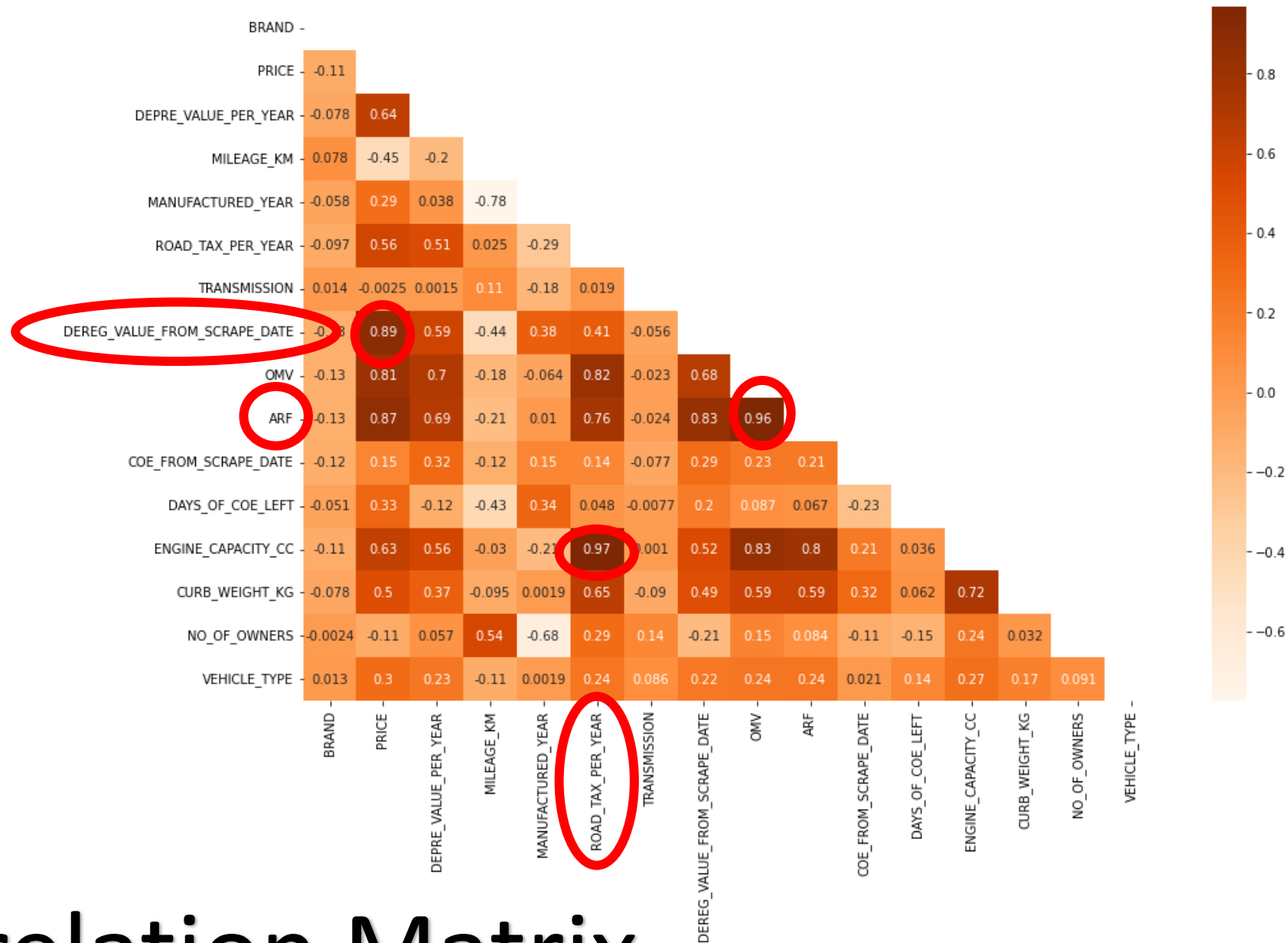


Manufactured Year vs Price



Transmission





Correlation Matrix

Features Dropped

REG_DATE – (Date)

LISTING_URL (Website)

SCRAPE_DATE (Date)

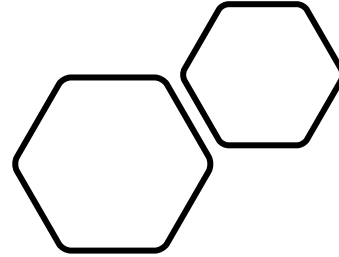
Unnamed: 0 (Null)

DEREG_VALUE_FROM_SCRAPE_DATE

ARF

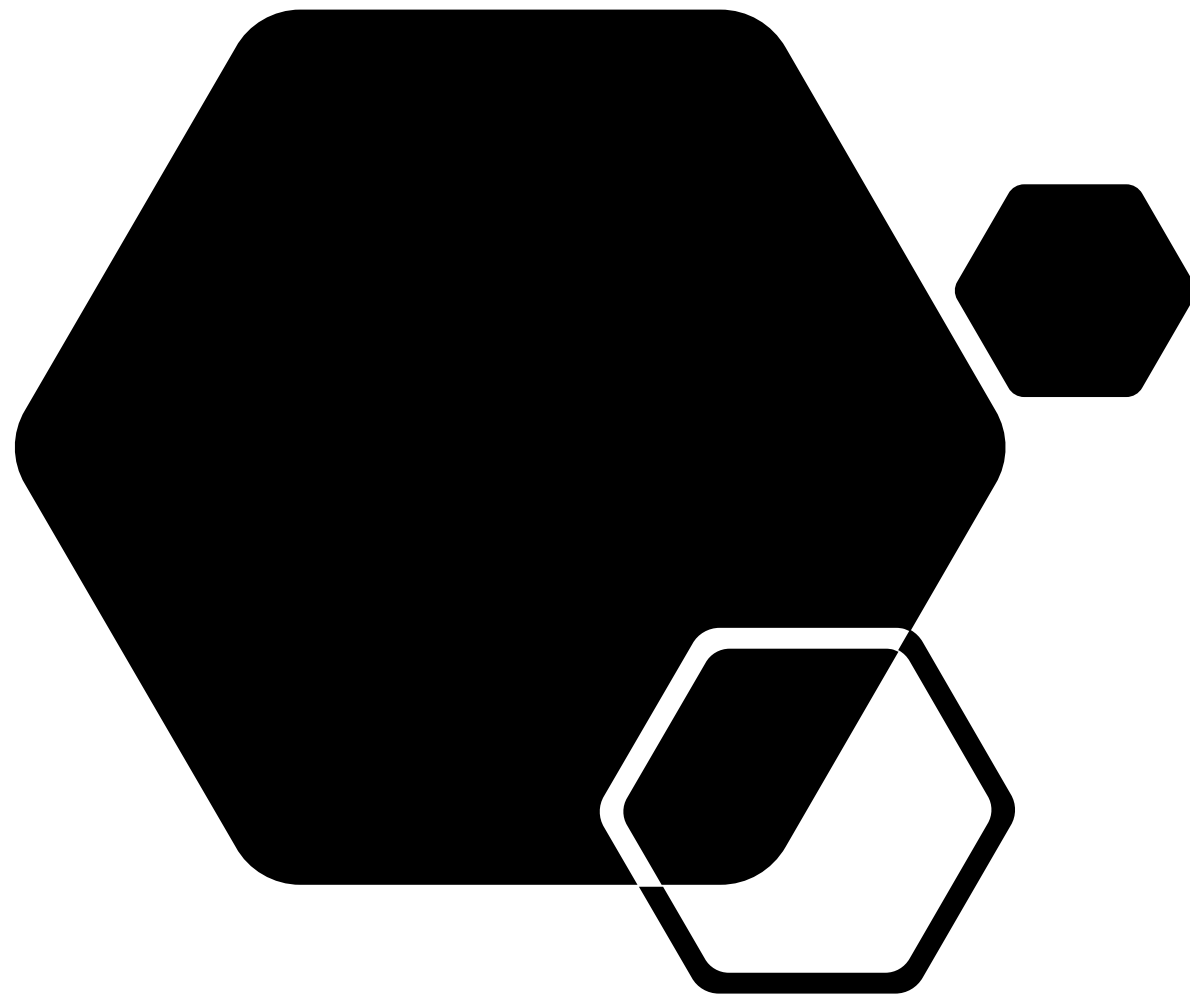
ROAD_TAX_PER_YEAR

Model



Model

Data is split into 0.20 test and 0.8 for training with random state of 42





Model

- Linear Regression
- XG Boost Regressor
- Gradient Boosting Regressor
- Decision Tree
- Random Forest



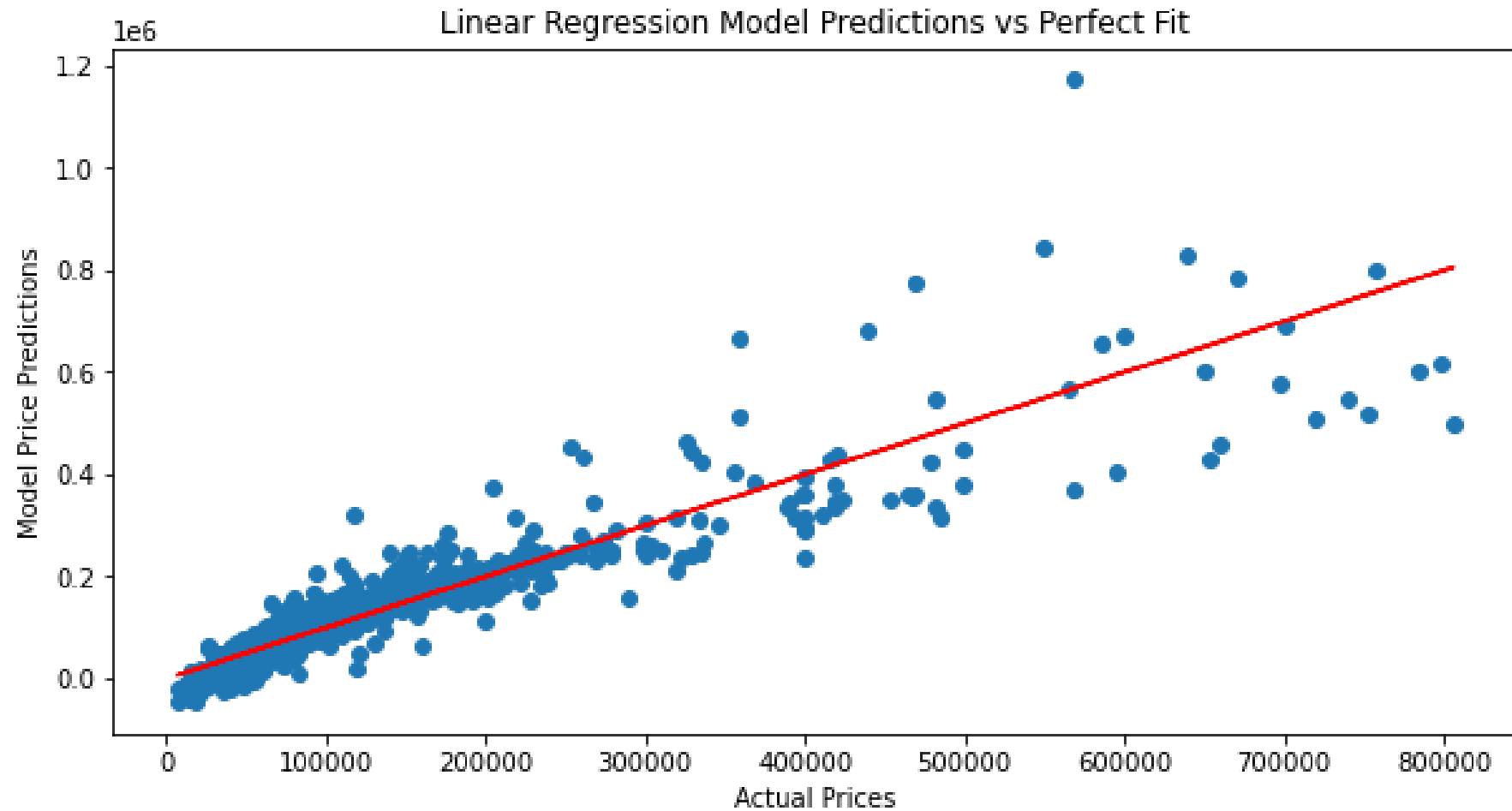
Linear Regression

Train Score : 0.8255

Test Score : 0.8178

Cross Validation Mean
Score : 0.8207

Linear Regression



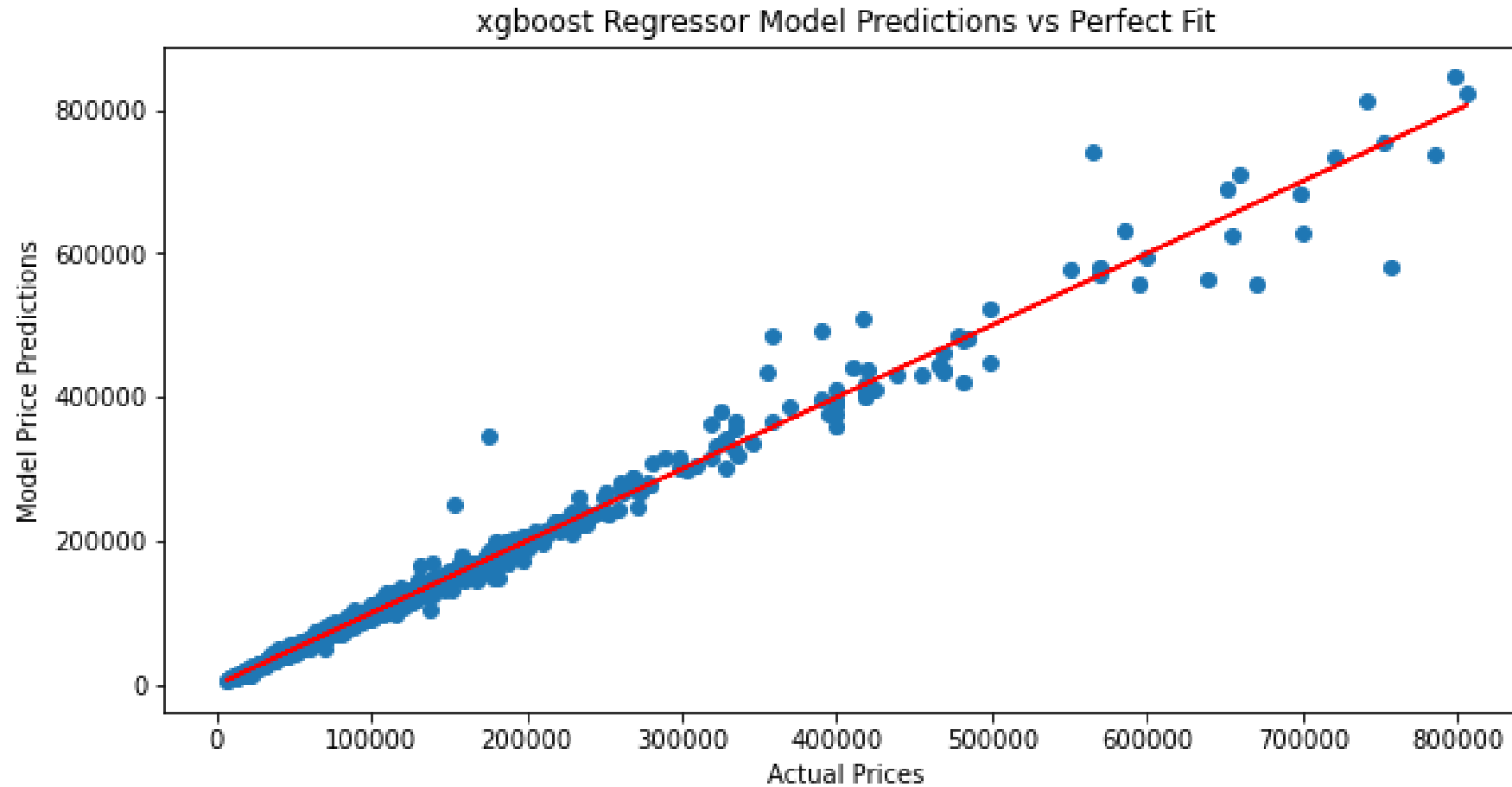
XG Boost Regressor

Train Score : 0.9998

Test Score : 0.9823

Cross Validation Mean
Score : 0.9826

XG Boost Regressor



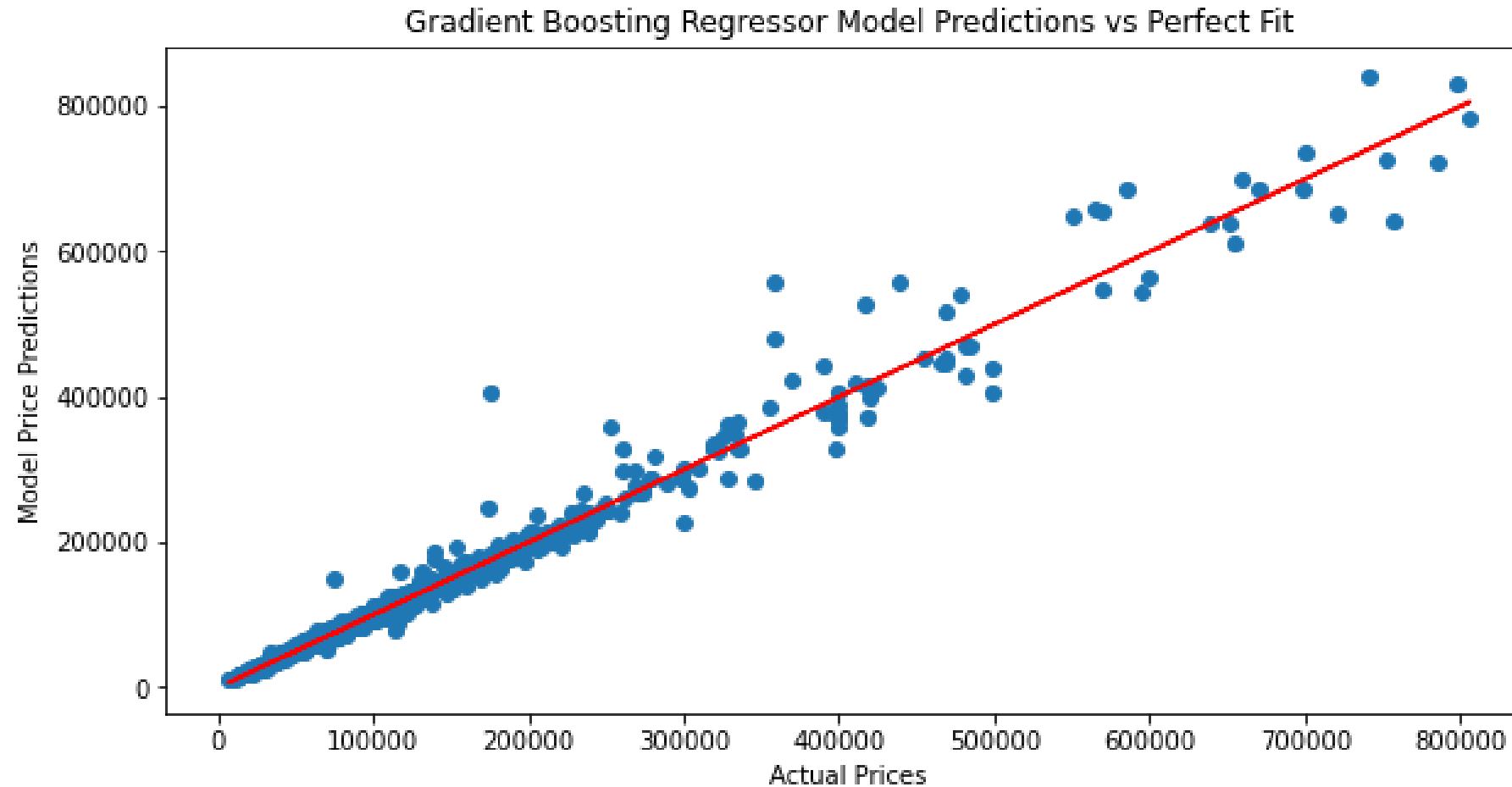
Gradient Boosting Regressor

Train Score : 0.9913

Test Score : 0.9749

Cross Validation Mean
Score : 0.9787

Gradient Boosting Regressor



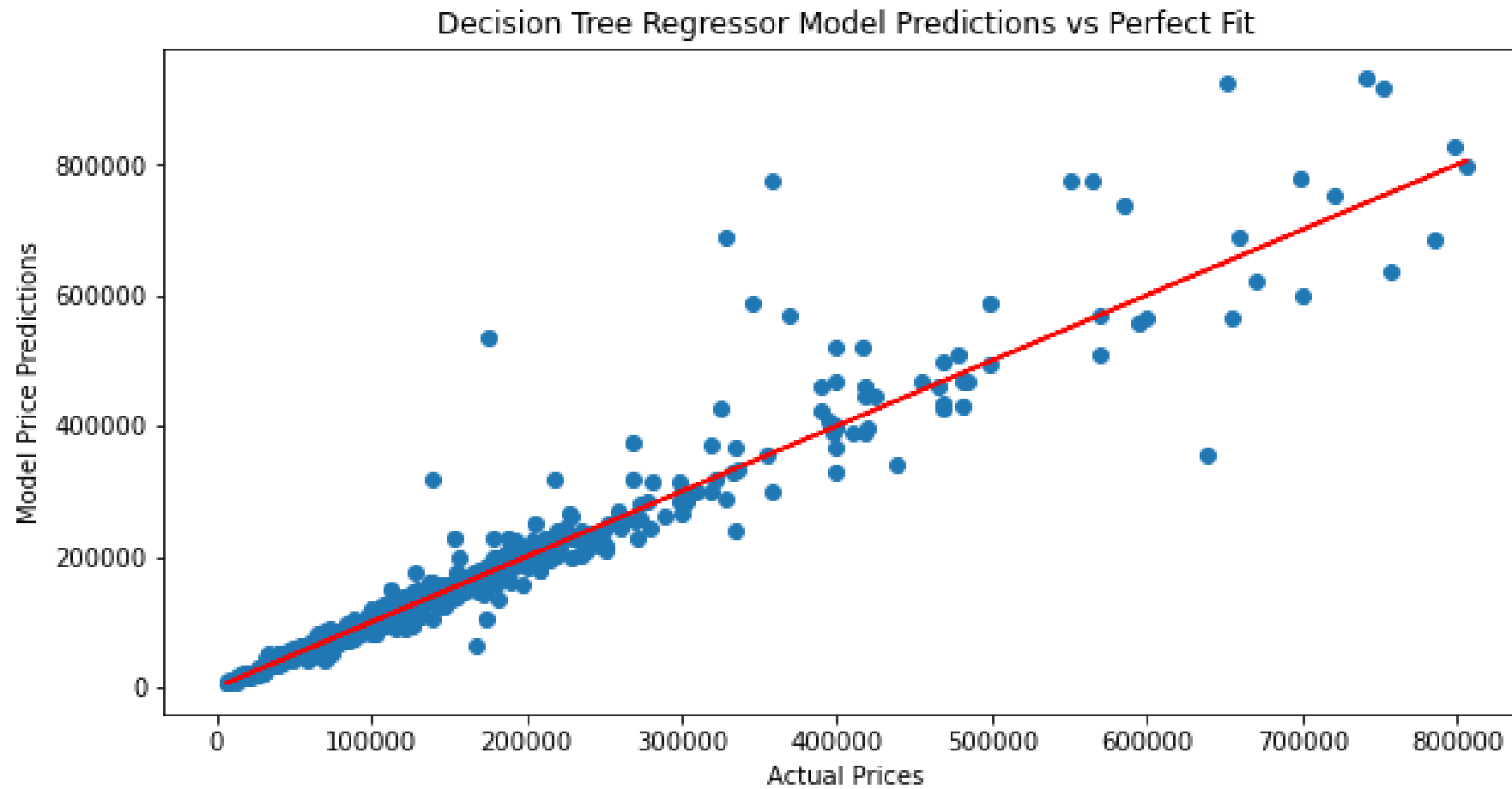
Decision Tree

Train Score : 1

Test Score : 0.91286

Cross Validation Mean
Score : 0.9571

Decision Tree



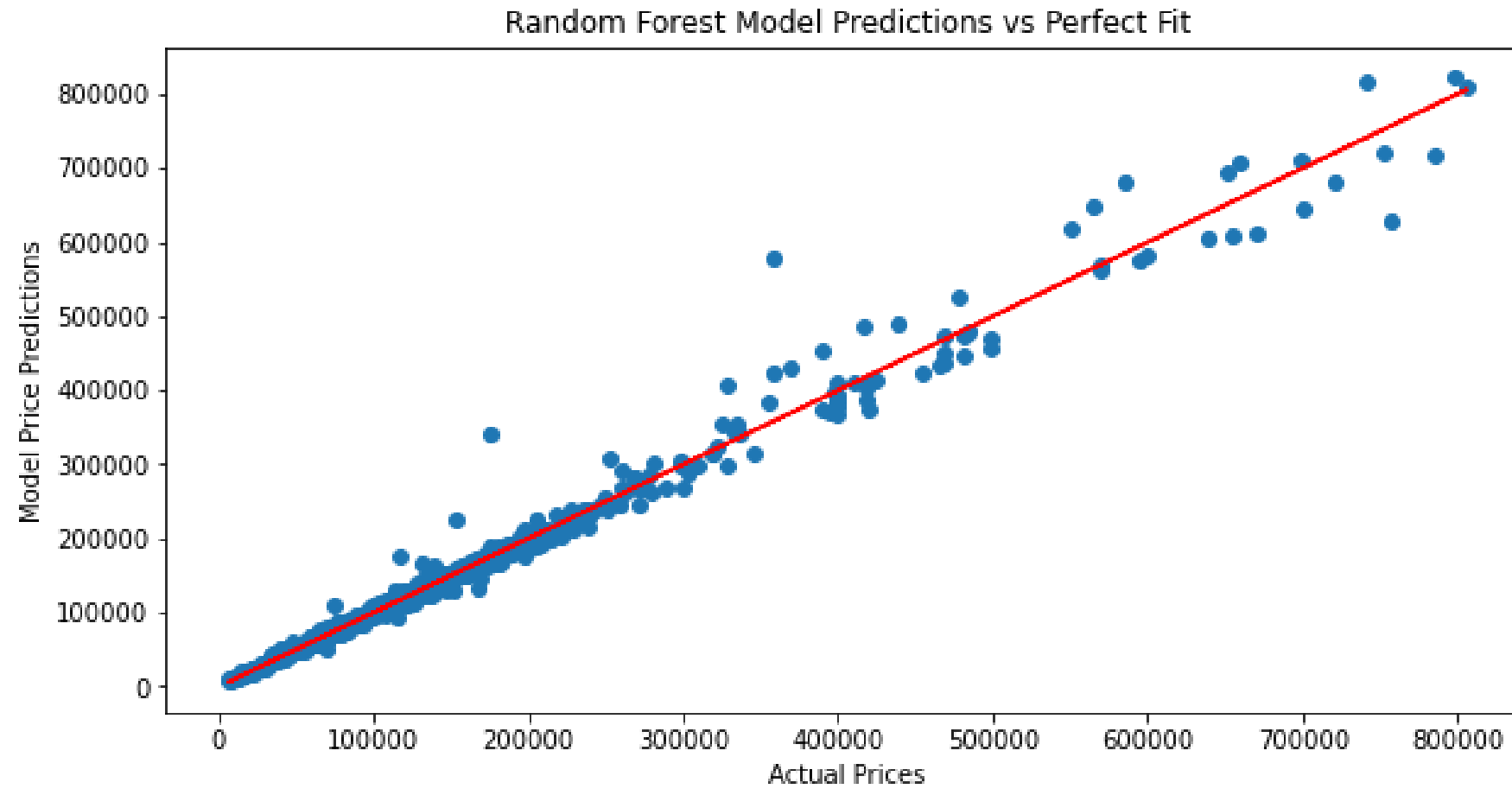
Random Forest

Train Score : 0.9982

Test Score : 0.9833

Cross Validation Mean
Score : 0.9862

Random Forest





Model Evaluation

	TRAIN	TEST	CV MEAN SCORE
Linear Regression	0.8255	0.8178	0.8207
XG Boost Regressor	0.9998	0.9823	0.9826
Gradient Boosting Regressor	0.9913	0.9749	0.9787
Decision Tree	1	0.9128	0.9571
Random Forest	0.9982	0.9833	0.9862

Model Evaluation

	MAE	MSE	RMSE
Linear Regression	27848	2352435395	48501
XG Boost Regressor	5893	228397406	15112
Gradient Boosting Regressor	7274	324040955	18001
Decision Tree	11163	1125082759	33542
Random Forest	5649	214936138	14660

Conclusion

- Mercedes Benz has the highest number of car
- Bentley and Lamborghini SUV are the most expensive in this dataset
- Price decreases as mileage increases
- Luxury Sedan has the highest number of cars
- Sports car category are the most expensive, midsize sedan are the least expensive
- As engine cc increase price increase generally
- Majority of the cars are manufactured in 2016
- The newer the cars the higher the price in general
- Not many manual cars in this dataset as almost all the cars are automatic
- Both XG Boost and Random Forest have high accuracy scores and least errors overall.



The background image shows a modern automotive manufacturing plant. Several orange robotic arms are positioned over a production line where car chassis are being assembled. The robots are in various stages of movement, some holding parts. The factory floor is clean and well-lit with overhead industrial lights. The overall scene conveys a sense of high-tech automation in manufacturing.

Future Work

- Collect more data from other websites such as motorist, carro, etc
- Web Scrape further features such as horsepower, fuel type.
- Build on current features such as separating the brand and building the model individually
- More Customization for the user



Thank you

Deployment

- [Resale Car Prediction Page](#)
- [Jupyter Notebook \(Capstone Project\)](#)

Resale Car Price Prediction in Singapore

Capstone Project on 12 Mar 2022 by Derek Tan

Enter the values

Brand

Mercedes-Benz ▼

Depreciation (\$)

Mileage (KM)

Manufactured (Year)

Transmission

Auto ▼

OMV (\$)

Reference

- https://www.sgcarmart.com/main/about_us.php
- [https://github.com/xianjinseow92/Data-Science-Projects/tree/master/Project 2 SgCarMart%20Prediction](https://github.com/xianjinseow92/Data-Science-Projects/tree/master/Project%202%20SgCarMart%20Prediction)

