

Analyzing the Impact of Car Features on Price and Profitability

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Agenda



Introduction



Tech-stack used



Insights &
Dashboard



Conclusion



Result

Introduction

Project Description

The automotive industry has been rapidly evolving over the past few decades, In recent years, there has been a growing trend towards electric and hybrid vehicles, for that the client has asked how can a car manufacturer optimize pricing and product development decisions to maximize profitability while meeting consumer demand?

What I will be doing

I will be approaching the problem by analyzing the relationship between a car's features, market category, and pricing, and identifying which features and categories are most popular among consumers and

Insights

The insights could help the manufacturer improve its competitiveness in the market and increase its profitability over time.



Tech-stack used

MICROSOFT EXCEL 2021

I used this software as it has various functions that are convenient and faster to use. It helps in drawing meaningful conclusions and to create visualizing data to understand the problem clearly and to make data driven decisions.



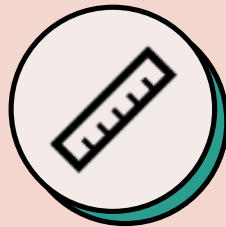
Data Cleaning



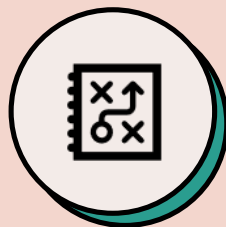
Understand the given dataset thoroughly, find the blank columns in the data, remove the unnecessary column and perform descriptive statistics wherever necessary



There are 4 columns with null values, I have imputed the values from online data from www.cars-data.com, as the null values were not more than 70 and can be imputed online easily



Checked for duplicate values and found out there were 715 duplicate values and removed them.

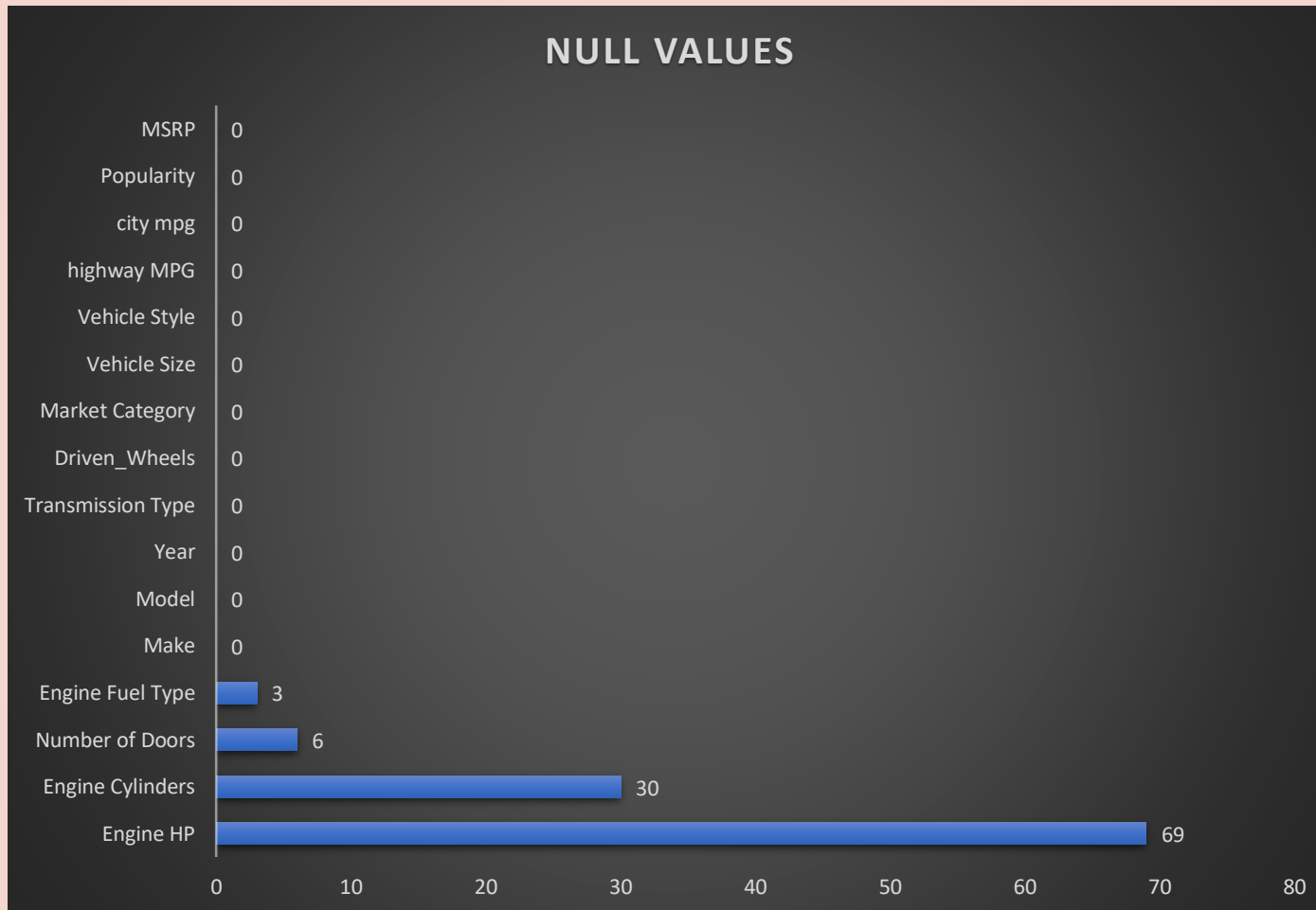


Analyzed the data and performed various univariate and bivariate analysis.



Made various graphs for understanding the data more clearly, and made an interactive dashboard for client.

Null Values



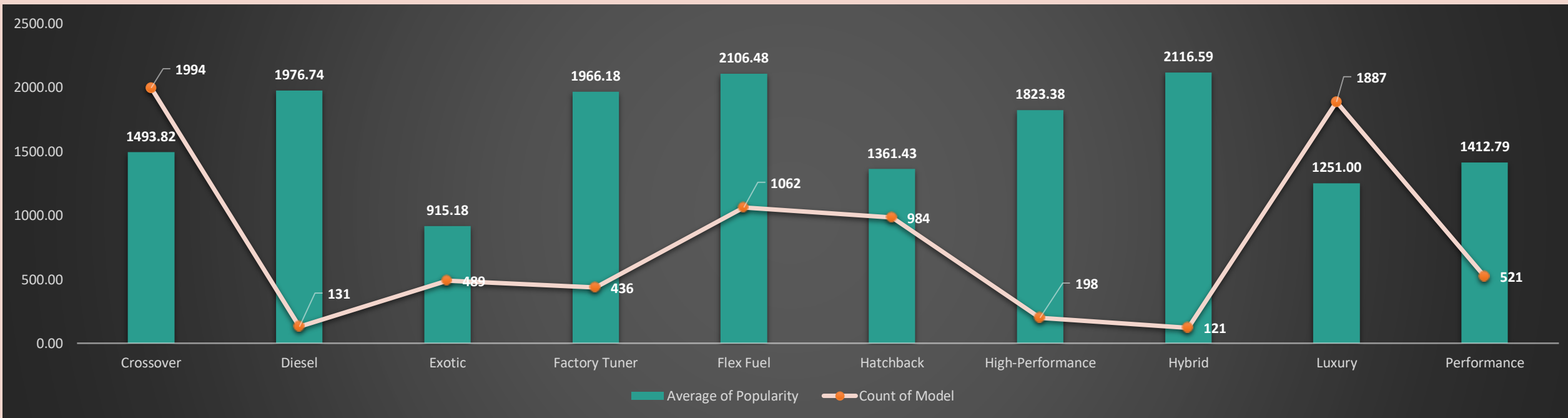
COLUMNS	NULL VALUES	
Engine HP	69	online
Engine Cylinders	30	online
Number of Doors	6	online
Engine Fuel Type	3	online
Make	0	
Model	0	
Year	0	
Transmission Type	0	
Driven_Wheels	0	
Market Category	0	
Vehicle Size	0	
Vehicle Style	0	
highway MPG	0	
city mpg	0	
Popularity	0	
MSRP	0	



Insights

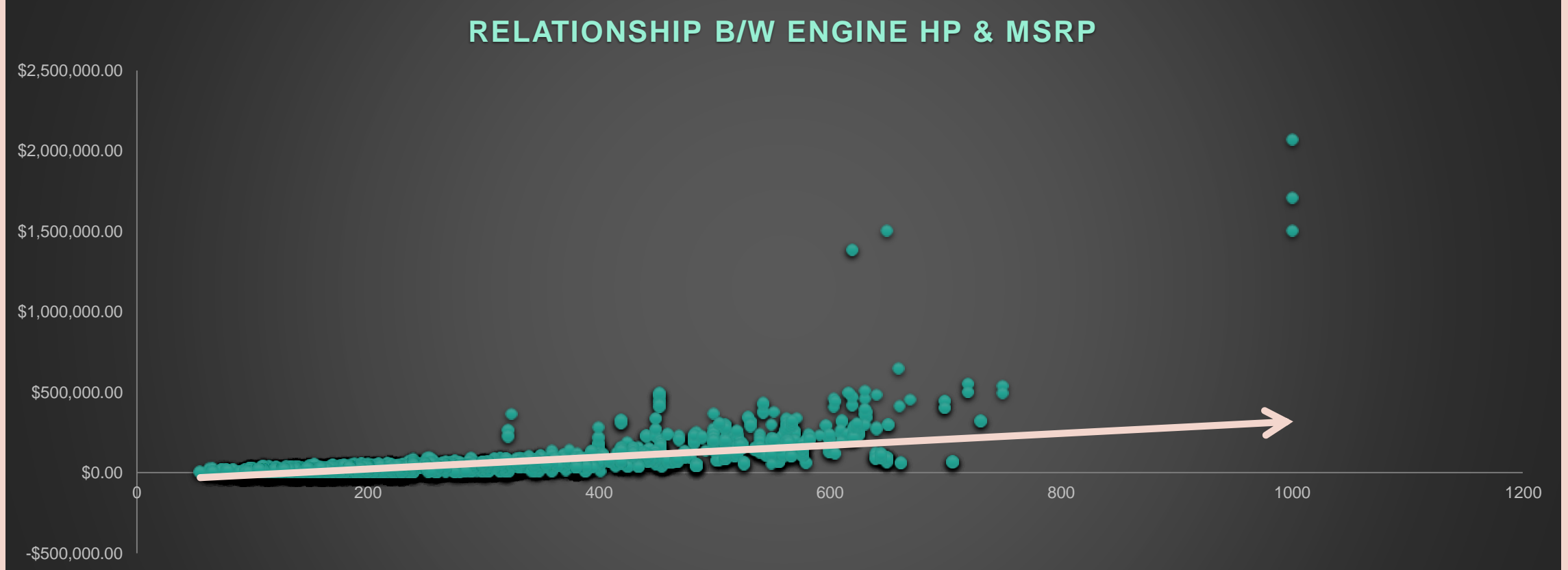


1) How does the popularity of a car model vary across different market categories?



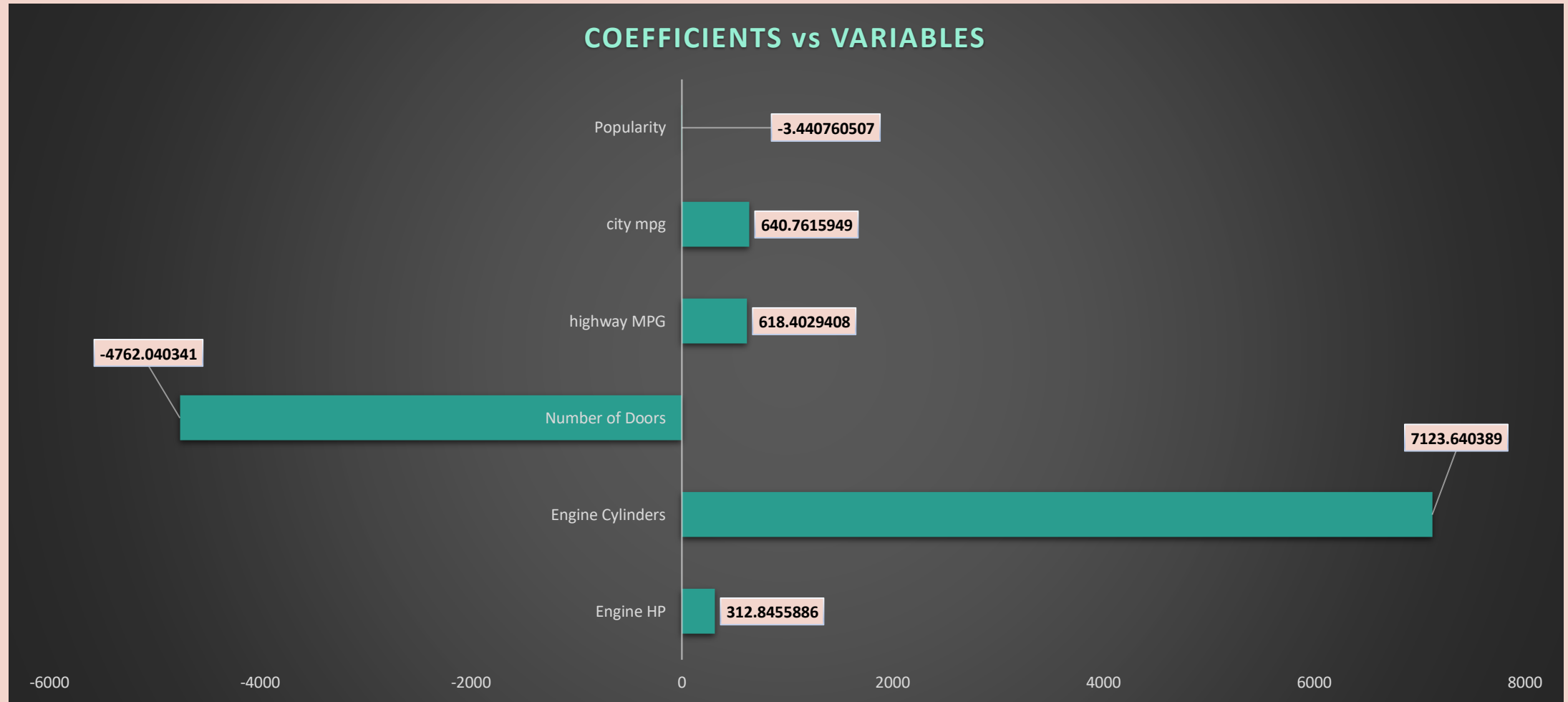
We can see from the chart that some of the most popular market category for car models are FLEX FUEL, CROSSOVER, HATCHBACK, PERFORMANCE with average model count and high popularity. HYBRID is the most popular market category with the lowest model count.

2) What is the relationship between a car's engine power and its price?



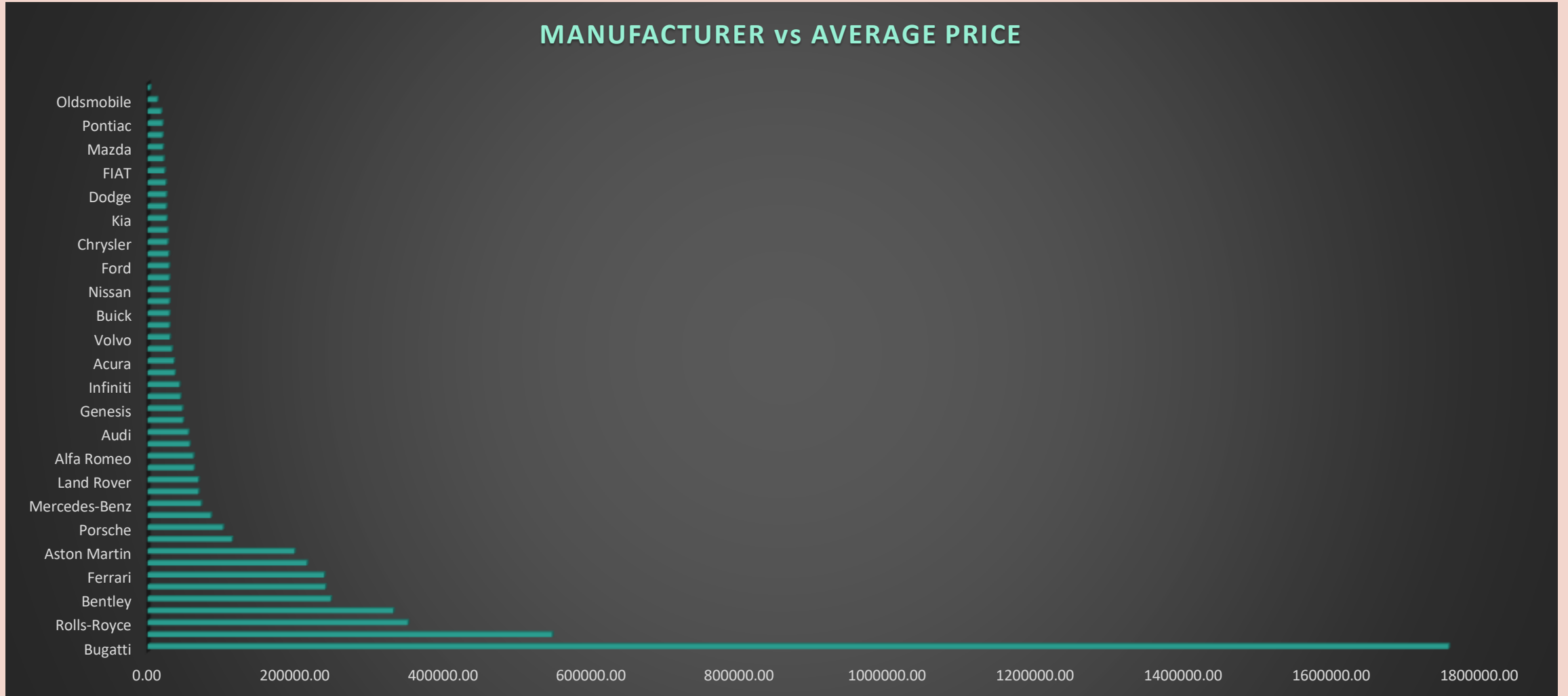
As the engine horsepower increases price of the car also increases, there's a positive relation between the two.

3) Which car features are most important in determining a car's price?



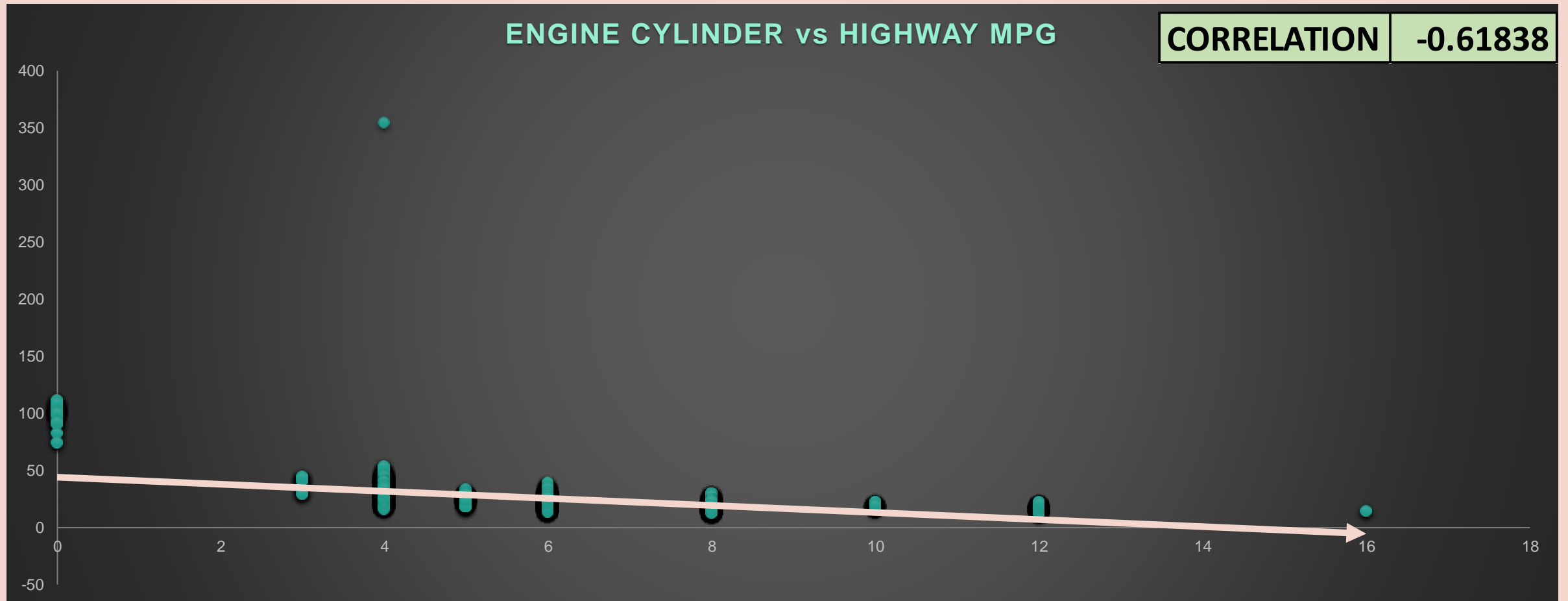
From the graph we can conclude that **ENGINE CYLINDERS** are the most important variable in determining the price of a car.

4) How does the average price of a car vary across different manufacturers?



BUGATTI has the highest average price and PLYMOUTH has the lowest average price, as the graph determines.

5) What is the relationship between fuel efficiency and the number of cylinders in a car's engine?

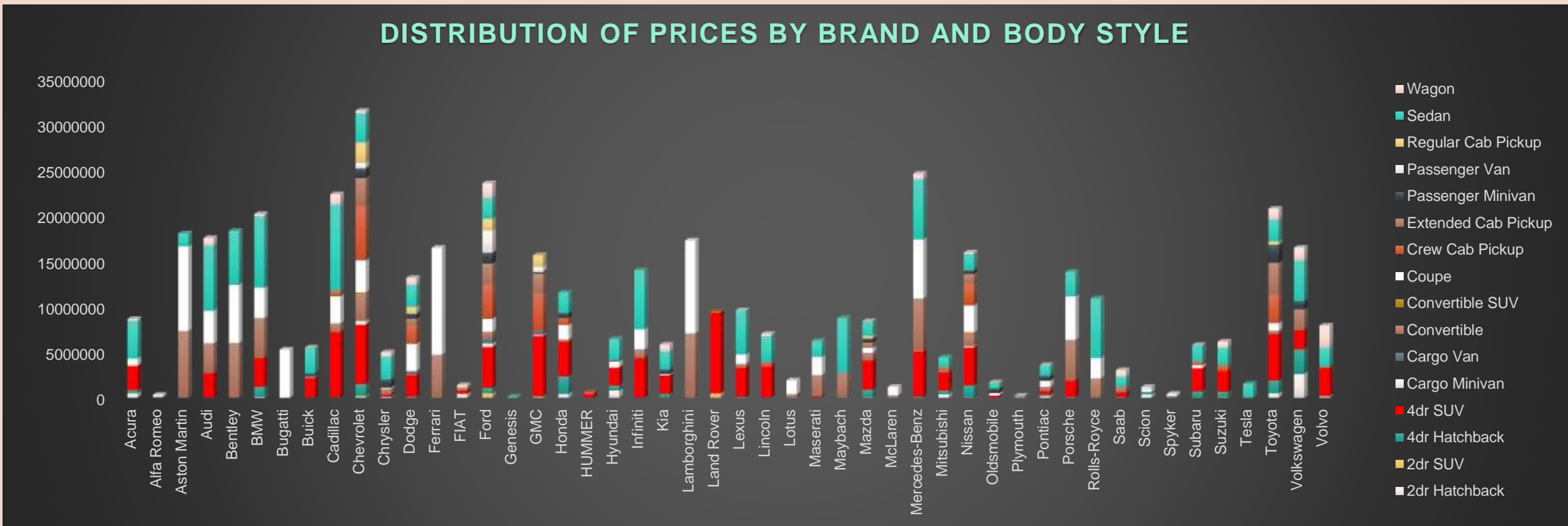




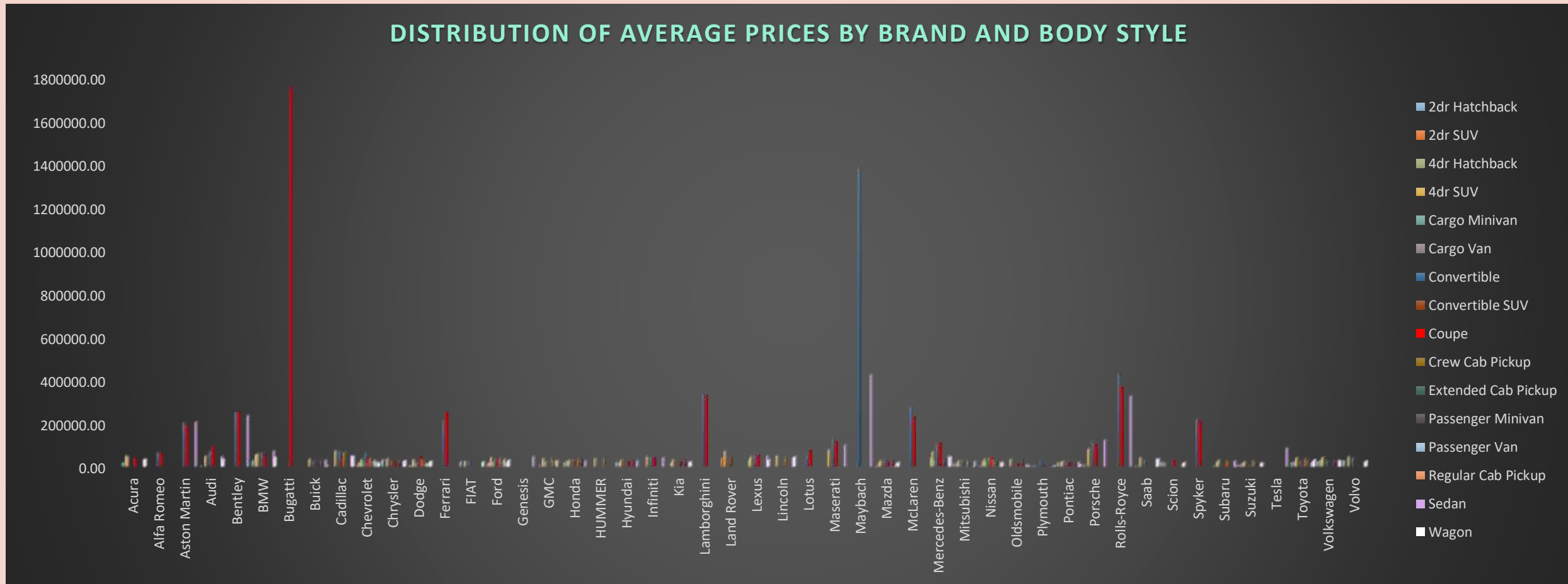
Building the dashboard



1) How does the distribution of car prices vary by brand and body style?

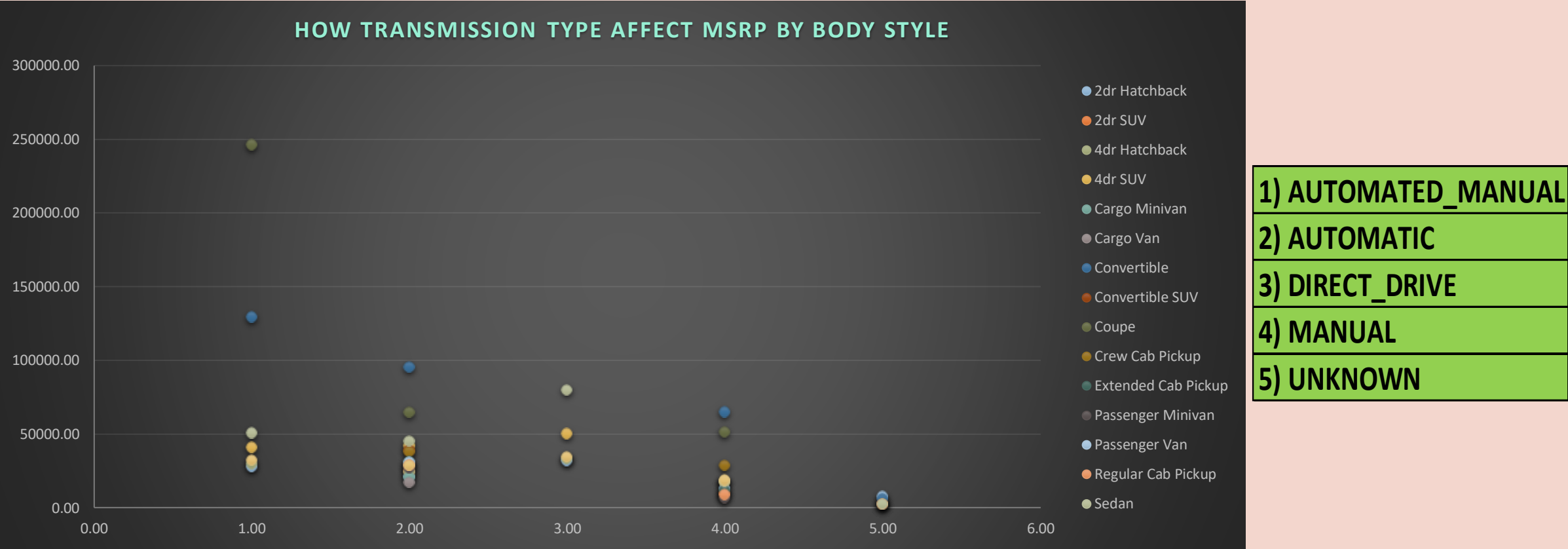


2) Which car brands have the highest and lowest average MSRPs, and how does this vary by body style?



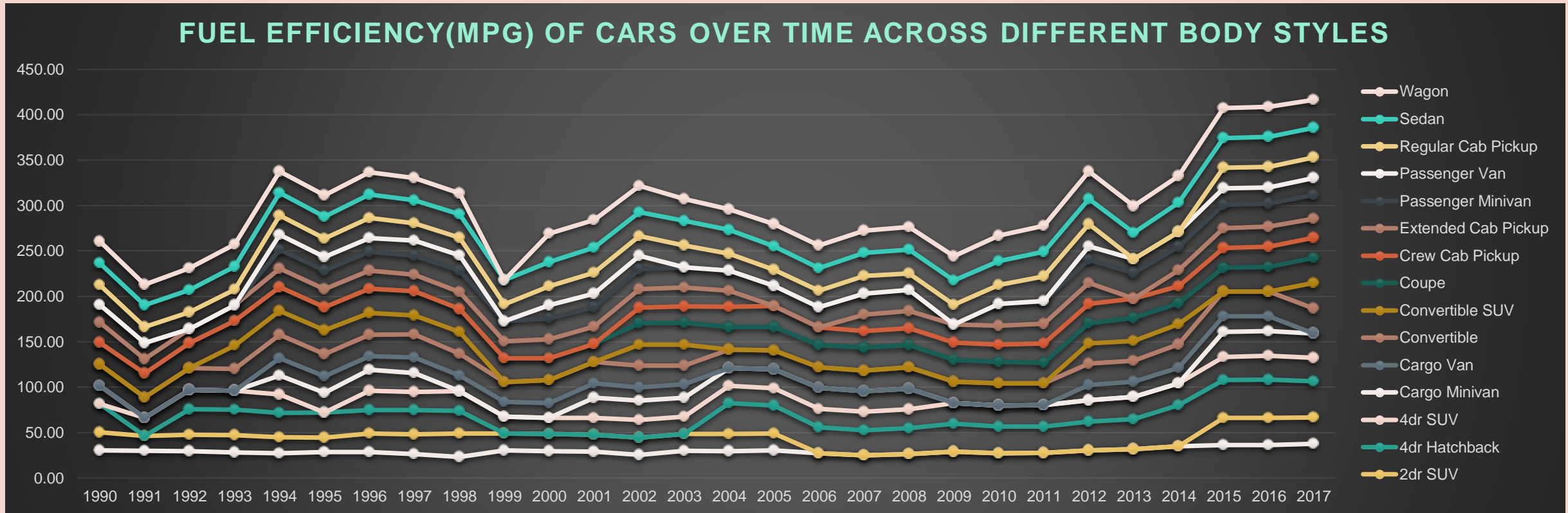
BUGATTI has the highest average price by body style whereas PLYMOUTH has the lowest average price by body style.

3) How do the different feature such as transmission type affect the MSRP, and how does this vary by body style?



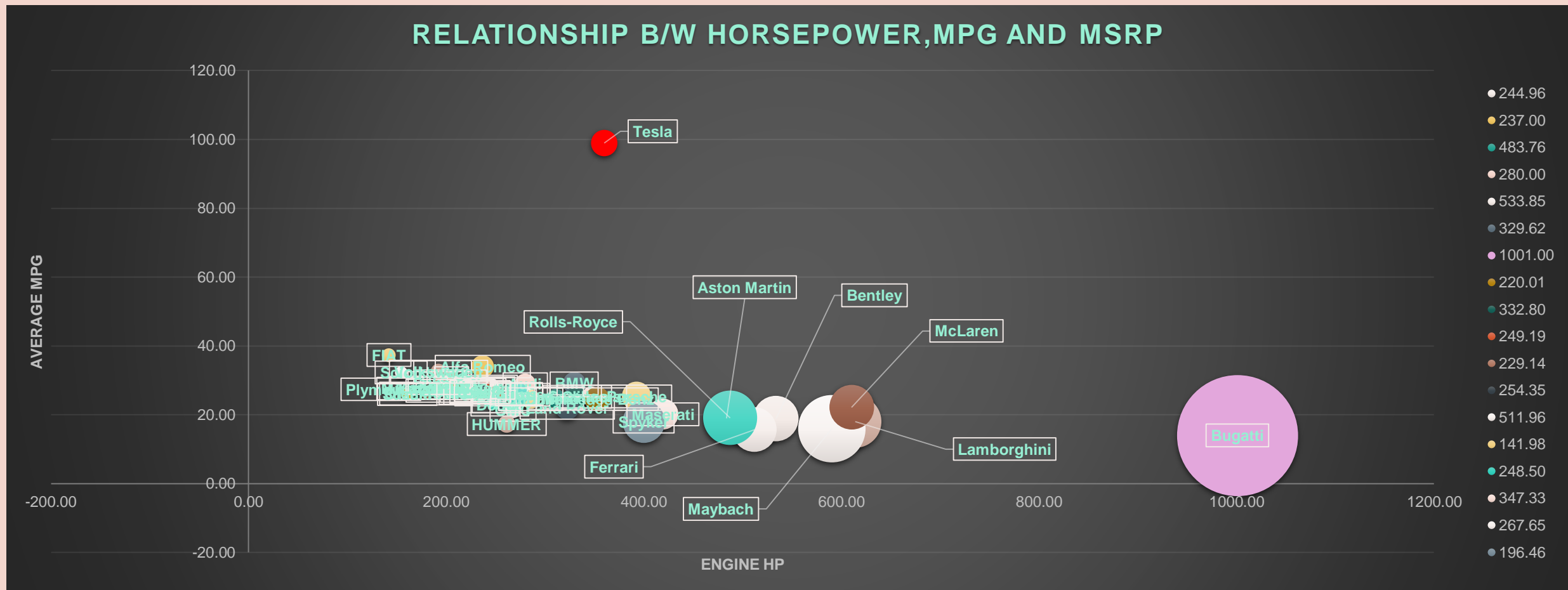
As we can see AUTOMATED_MANUAL with COUPE body style is the most expensive transmission.

4) How does the fuel efficiency of cars vary across different body styles and model years?



From the graph we can see fuel efficiency of cars has increased over the years across different body styles. The highest fuel efficiency is of WAGON body style in the year 2017.

5) How does the car's horsepower, MPG, and price vary across different Brands?



From the graph we can conclude that as the ENGINE HP increases, MPG decreases but PRICE (MSRP) increases.

Conclusion

Most popular
market category
for car models are
**FLEX FUEL,
CROSSOVER,
HATCHBACK,
PERFORMANCE**

CHEVROLET has
the highest
price
distribution by
body style.

**AUTOMATED_M
ANUAL** with
COUPE body
style is the most
expensive
transmission

If engine
power
increases,
price of car
also **increases**

BUGATTI has the
highest average
price and
PLYMOUTH has the
lowest average
price.

Conclusion

If the number of cylinders **increases** highway MPG **decreases**

WAGON body style has the highest fuel efficiency

BUGATTI has the highest average price by body style whereas **PLYMOUTH** has the lowest average price by body style

If the ENGINE HP **increases**, MPG **decreases** but PRICE (MSRP) **increases**

ENGINE CYLINDERS are the most important variable in determining the price of a car

Google Drive Link

I have made an interactive dashboard in excel, the google drive link for that is given below, please ctrl+click to see the dashboard

DASHBOARD LINK



Result

The project was quite challenging and taught me a good amount things about how a automotive industry maintains it's business and what type of questions you have to ask to gain profitability in the market. I also used various functions and charts to understand the data and chug out the important insights for the automotive industry.

Thank you

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