Analyzing the Impact of Car Features on Price and Profitability

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PROJECT DESCRIPTION

The car industry is changing fast, with a focus on fuel efficiency and new tech. People want electric and hybrid cars, but gasoline cars are still popular. Companies need to understand what customers want to make more money.

This project aims to study how different features of cars affect their prices and profitability in the automotive industry.
By analyzing data about over 11,000 car models, companies can see which features and types of cars sell best. This helps them decide what new cars to make and how much to charge.

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APPROACH

01 Data Collection and Familiarization

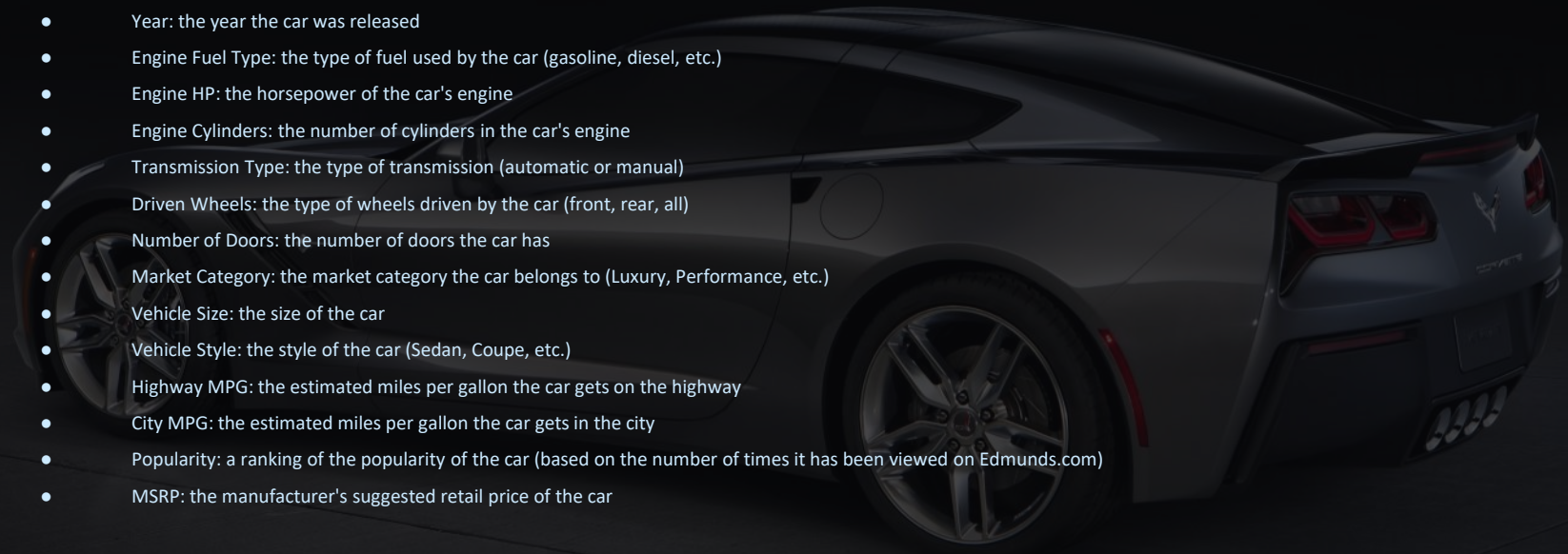
02 Data Cleaning and Preparation

03 Data Analysis

04 Building the Interactive Dashboard

Dataset Description

- Make: the make or brand of the car
- Model: the specific model of the car
- Year: the year the car was released
- Engine Fuel Type: the type of fuel used by the car (gasoline, diesel, etc.)
- Engine HP: the horsepower of the car's engine
- Engine Cylinders: the number of cylinders in the car's engine
- Transmission Type: the type of transmission (automatic or manual)
- Driven Wheels: the type of wheels driven by the car (front, rear, all)
- Number of Doors: the number of doors the car has
- Market Category: the market category the car belongs to (Luxury, Performance, etc.)
- Vehicle Size: the size of the car
- Vehicle Style: the style of the car (Sedan, Coupe, etc.)
- Highway MPG: the estimated miles per gallon the car gets on the highway
- City MPG: the estimated miles per gallon the car gets in the city
- Popularity: a ranking of the popularity of the car (based on the number of times it has been viewed on Edmunds.com)
- MSRP: the manufacturer's suggested retail price of the car



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TECH-STACK

Microsoft Excel:

For Cleaning Data,

Analyzing Data And Visualization

Microsoft Power Point:

For Creating The Report

Excel Link: CLICK HERE!


/INSIGHTS

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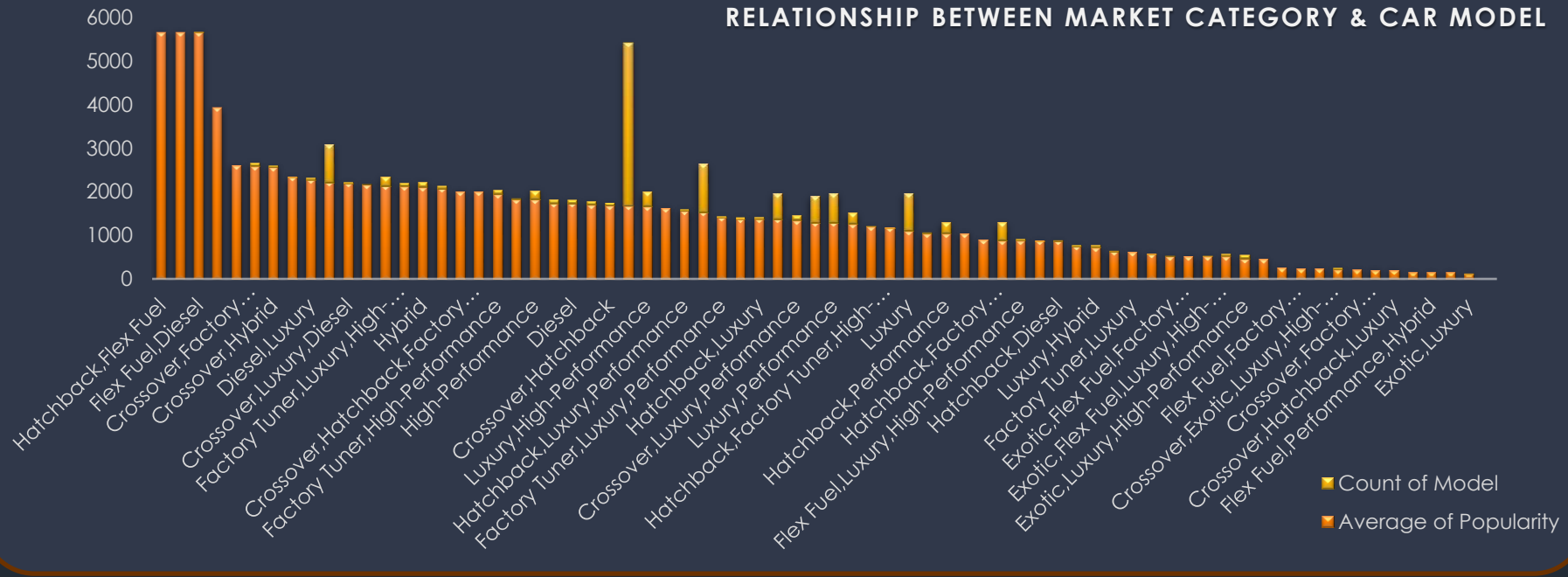
Popularity



The quantity of car models in different market categories,

along with their respective popularity scores.

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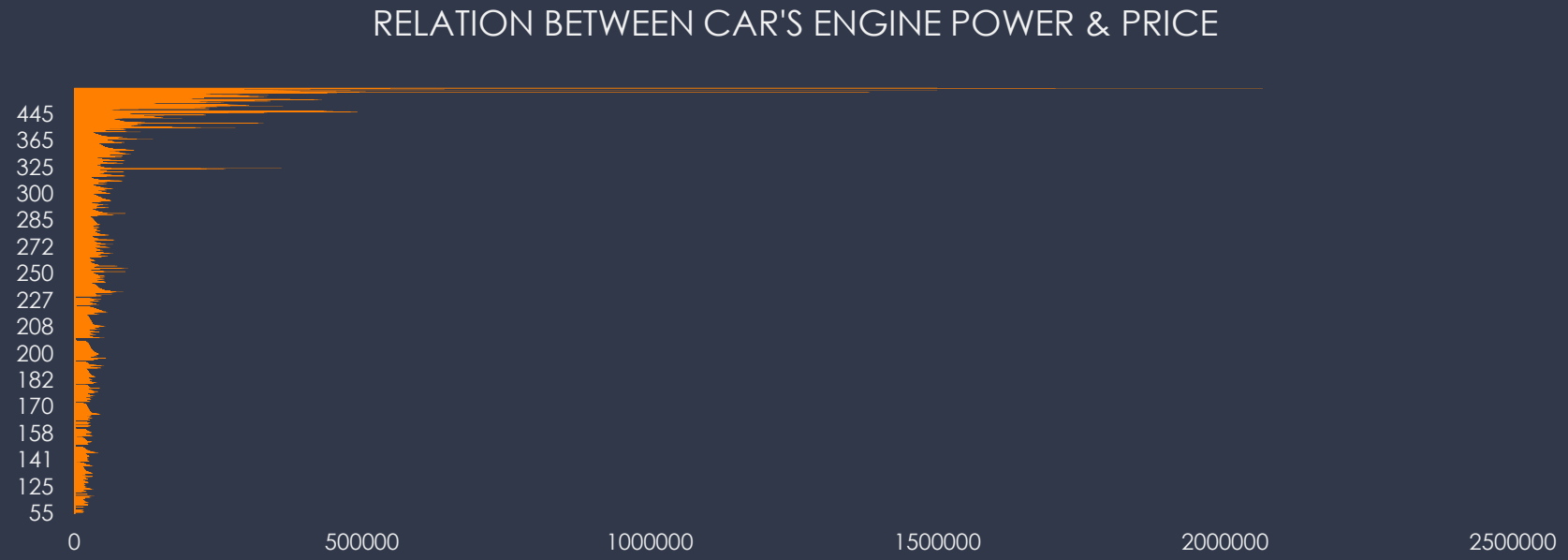
Regression Analysis



The graph exhibits a positive trendline slope, suggesting a direct correlation between a car's engine power and its price. This implies that vehicles equipped with more powerful engines generally have higher price tags.

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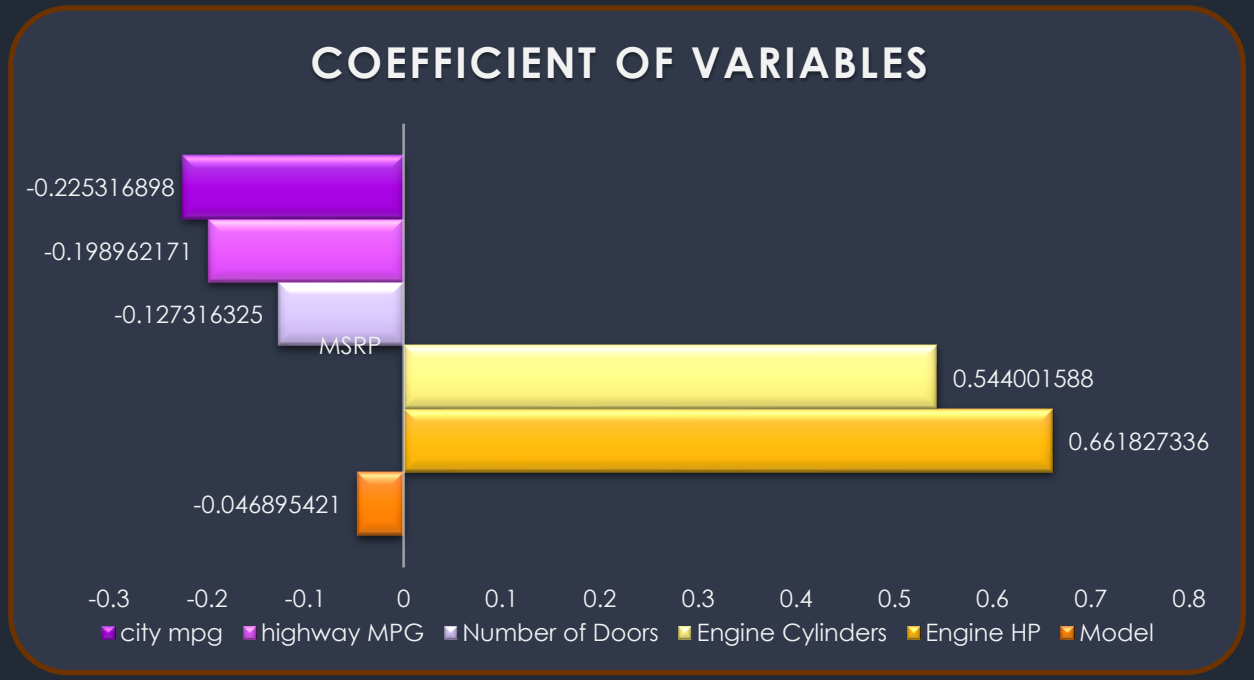
Car's engine power vs price



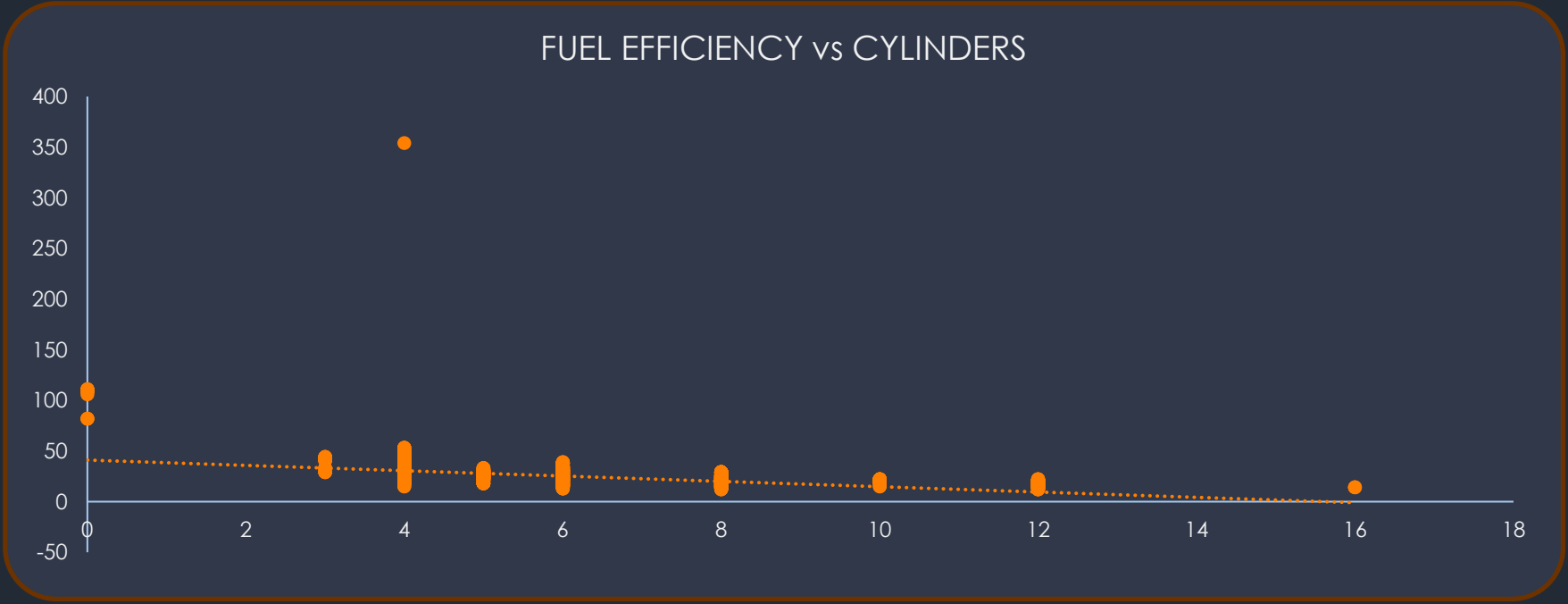
	Model	Engine HP	Engine Cylinders	Number of Doors	highway MPG	city mpg
MSRP	-0.046895421	0.661827336	0.544001588	-0.127316325	-0.198962171	-0.225316898

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.681376129
R Square	0.464273429
Adjusted R Square	0.464003474
Standard Error	44006.94687
Observations	11914

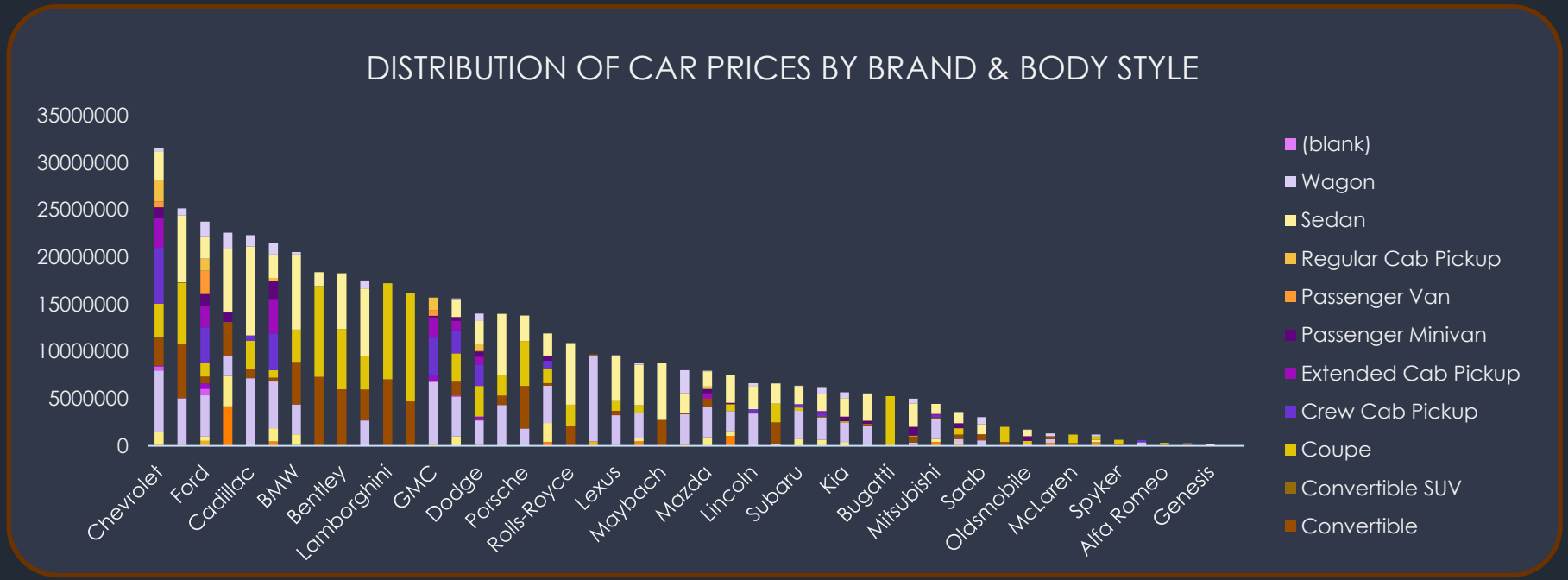
From the bar chart we can conclude that the strongest relationship with price is of Engine Cylinders and the negative relationship is with Number of Doors, which means that as the number of doors in a vehicle increases, the price tends to decrease, and vice versa

Fuel efficiency Vs Cylinders



Upon conducting the analysis, it was observed that there exists a negative correlation between the number of cylinders in a car's engine and its highway miles per gallon (MPG). This implies that as the number of cylinders increases, the fuel efficiency of the vehicle tends to decrease. The graph visually depicts this relationship, with the trendline exhibiting a negative slope, indicating a decline in highway MPG as the number of cylinders in the engine increases.

Car Price Distribution



This analysis offers valuable insights into the variations in car prices based on brand and body style. Such insights can prove beneficial for manufacturers in optimizing their pricing strategies and enhancing profitability. Additionally, the utilization of slicers enables a deeper exploration of the data, allowing for a more detailed examination of specific details and patterns. The following brand Chevrolet, Mercedes-Benz and Ford have the highest sum MSRP ,similarly the vehicle styles sedan, coupe and passenger minivan have the highest sum MSRP

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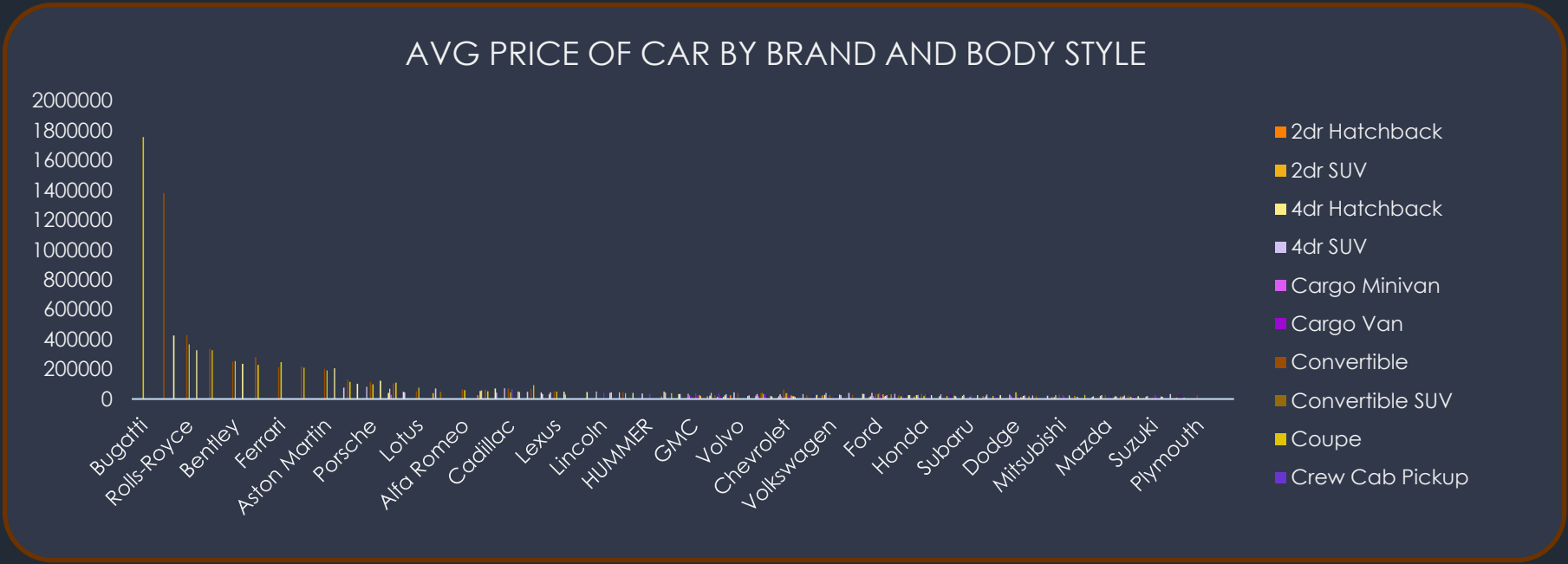
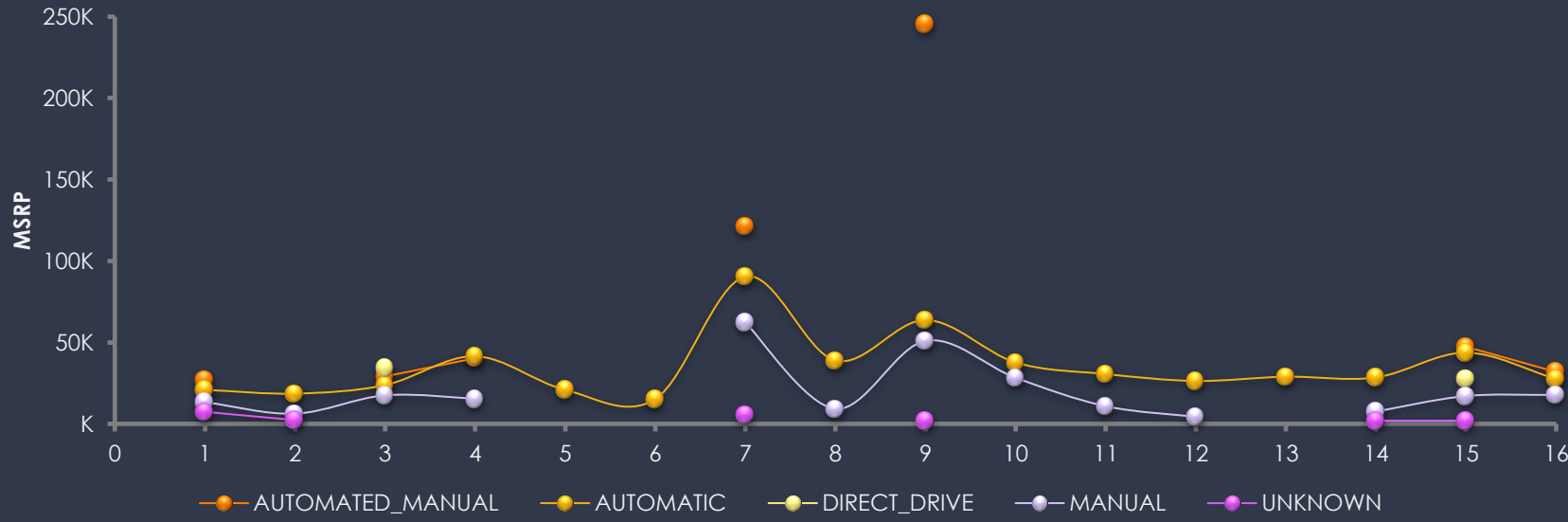
Avg Price of Car(body & style)



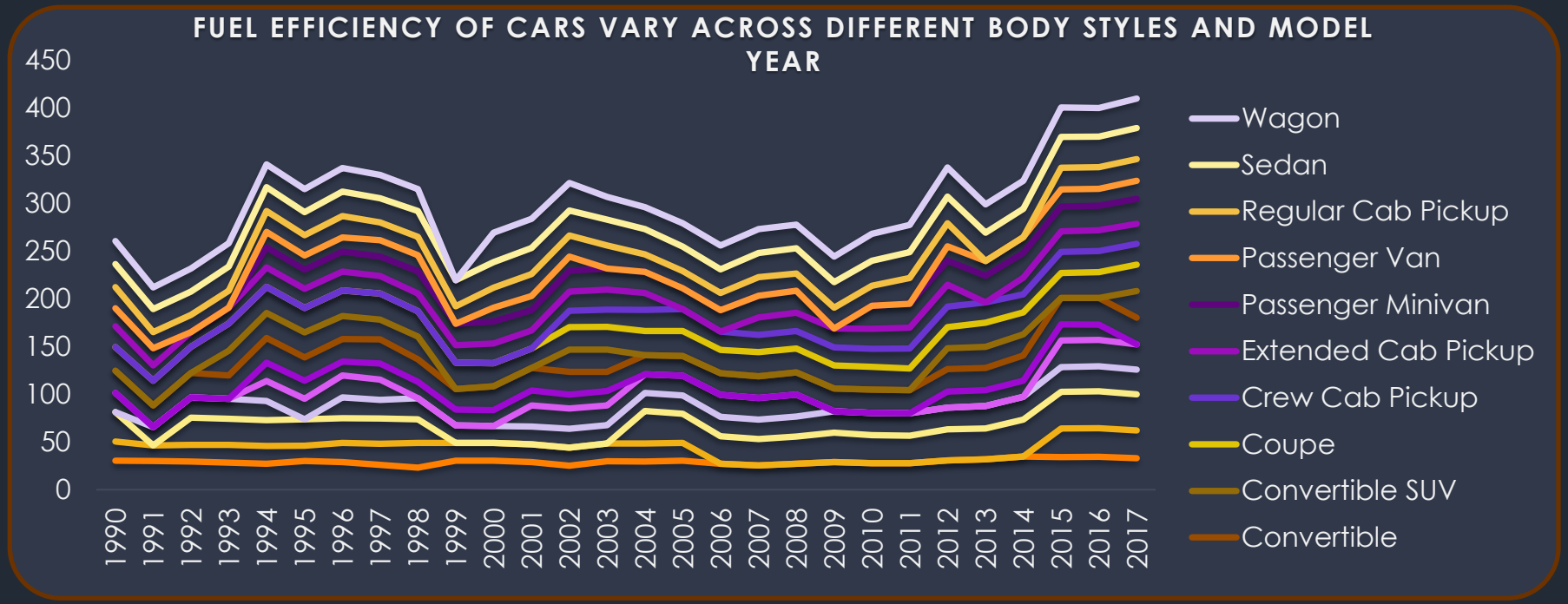
This analysis can offer insights into how prices differ among vehicles produced by each manufacturer, and whether certain manufacturers generally produce cars that are more expensive or less expensive overall.

Transmission Type

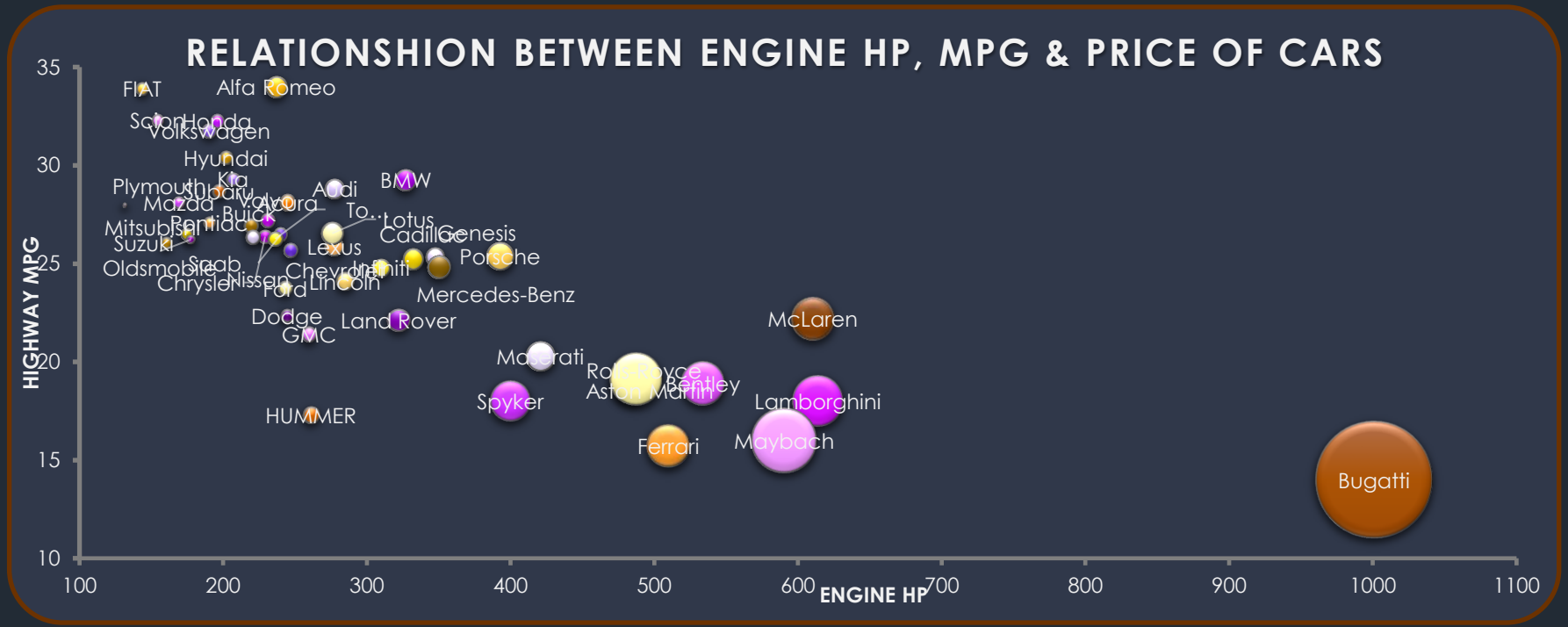


During the analysis, it was observed that body styles such as 4Dr hatchback, 2Dr hatchback, and sedan tend to exhibit higher overall fuel efficiency. This suggests that these particular body styles have shown a greater focus on fuel efficiency improvements compared to other styles.

Fuel Efficiency Over Time



Relation HP, MPG, MSRP



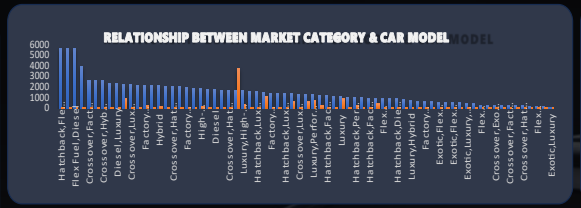
The analysis reveals that certain brands exhibit higher average horsepower, while others have lower average horsepower. This trend holds true for average miles per gallon (MPG) and manufacturer's suggested retail price (MSRP) as well. In other words, there are variations in average horsepower, MPG, and MSRP across different brands, indicating disparities in performance, fuel efficiency, and pricing within the automotive market.

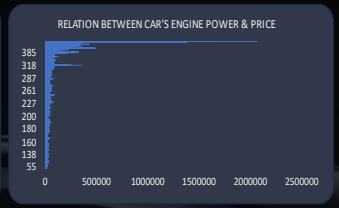
Dashboard

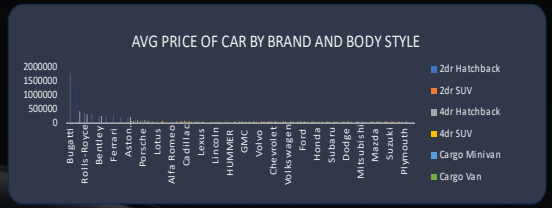
Brand	Transmission Type	Driven Wheels	Number of Doors	Vehicle Size	Vehicle Style
Chevrolet	Automatic	Front Wheel Drive	4	Automatic	Sedan
1115	8231	4732	8263	4708	3013

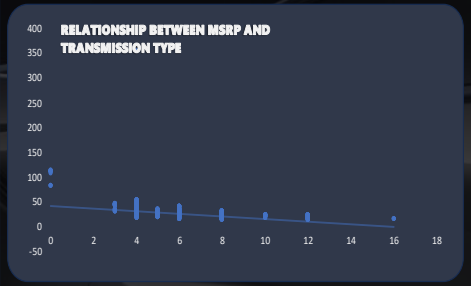
Filter Panel

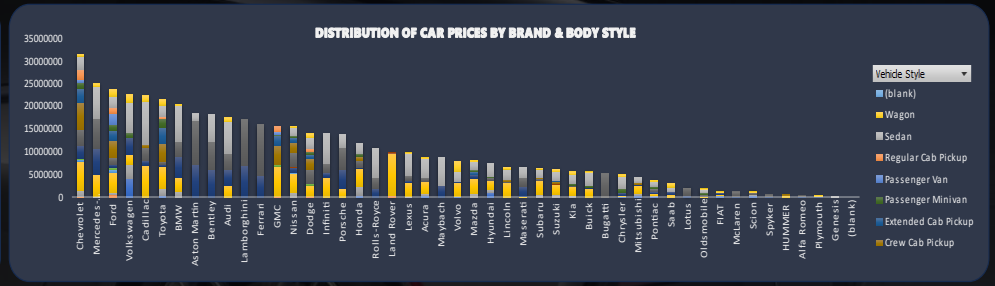
- **Make**: Chevrolet, Chrysler, Dodge
- **Model**: 62, 80, 86
- **Market Category**: Crossover, Crossover,Diesel, Crossover,Exotic,Lu...
- **Transmission Type**: AUTOMATED_MAN..., AUTOMATIC, DIRECT_DRIVE
- **Vehicle Style**: 2dr Hatchback, 2dr SUV, 4dr Hatchback

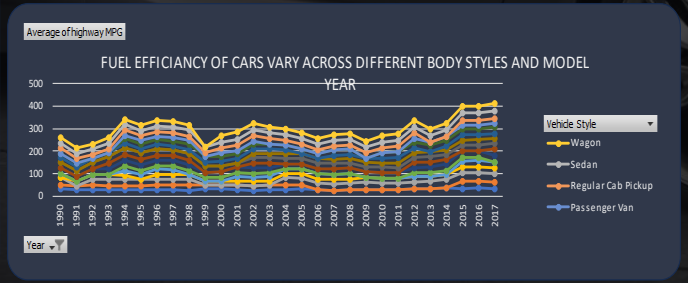


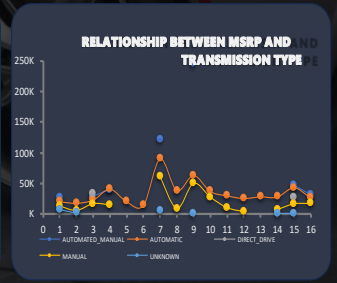


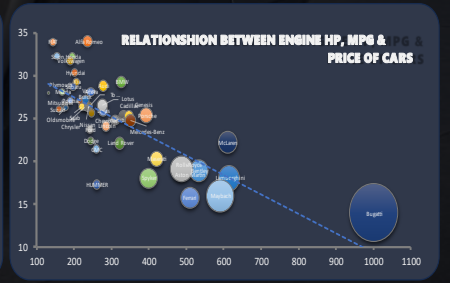












Result

Visuals:

I used visualizations such as pivot tables, scatter graphs, and bar charts to show the report. These visualizations help people understand results better and make decisions easier.

Discussion:

I found in my study is really important for car makers. It tells them what people like in cars, how to set prices, and what's happening in the market. Knowing this helps them make better decisions to make more money and compete better.

Future Plans:

In the future, I can explore more about how prices change, use up-to-date market info, and use advanced computer techniques to predict what might happen. Also, it's important to keep an eye on what people like and what's happening in the market to stay competitive in the car industry.

Conclusion

During the project, I learned and used different ways to analyze data in Microsoft Excel. I got really good at using pivot tables, which helped me understand big sets of data quickly by spotting trends and unusual things. I also learned how to do regression analysis, which is a fancy way of saying I figured out how different things are connected and used that to make predictions. I got comfortable with making charts and graphs that make data easy to understand. I even made cool interactive dashboards that let people explore the data themselves. All of this helped me find important information and make smart decisions based on it. Overall, this project taught me a lot about Excel and how to use it to understand data better.

THANKS

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