

Analyzing the Impact of Car Features on Price and Profitability

Project Description –

The automotive industry has been rapidly evolving over the past few decades, with a growing emphasis on fuel efficiency, environmental sustainability, and technological innovation. As competition among manufacturers intensifies and the consumer landscape shifts, understanding the factors that drive consumer demand for cars has become crucial.

To address this, one could analyze the relationship between a car's features, market category, and pricing, identifying which attributes and categories are most popular with consumers and most profitable for manufacturers. Utilizing data analysis techniques such as regression analysis and market segmentation, manufacturers can develop a pricing strategy that balances consumer demand with profitability. This approach can also help pinpoint key product features to prioritize in future development efforts. By doing so, manufacturers can enhance their market competitiveness and boost profitability over time.

Business problem –

The project "Analyzing the Impact of Car Features on Price and Profitability" aims to investigate the relationship between a car's features and its popularity. By examining the popularity variable in the dataset, data analysts can identify which features are most favoured by consumers and how they influence a car's popularity. This information can help manufacturers make informed decisions about product development and marketing.

Another objective is to predict the price of a car based on its features and market category. By utilizing the various features and market category variables in the dataset, data analysts can develop a model to forecast a car's price. This model can help both manufacturers and consumers understand how different features impact a car's price, facilitating better pricing and purchasing decisions.

Overall, this dataset serves as a valuable resource for data analysts interested in exploring various facets of the automotive industry. It can provide insights that inform decisions related to product development, marketing, and pricing.

In this project, I first familiarized myself with the dataset and then performed data cleanup. This involved removing rows with blank cells and duplicate rows to ensure data quality.

Data Source –

https://docs.google.com/spreadsheets/d/1gxCZQBtJmdfSH_0jSCxmLz9euGk2Izf/edit?usp=sharing&ouid=102305100251595429851&rtpof=true&sd=true

Approach –

For analytical purposes, I utilized MS Excel to perform various functions such as creating pivot tables, generating graphs and charts, and conducting regression analysis. Excel is user-friendly and capable of producing impressive dashboards, making it an excellent tool for these tasks.

Tech-Stack Used –

Microsoft® Excel® 2019

Tasks: Analysis

Before diving into the analysis of the given dataset, it is crucial to perform thorough data cleaning to ensure accurate and reliable results. After cleaning the data, you can build an interactive dashboard in Excel to carry out the following tasks:

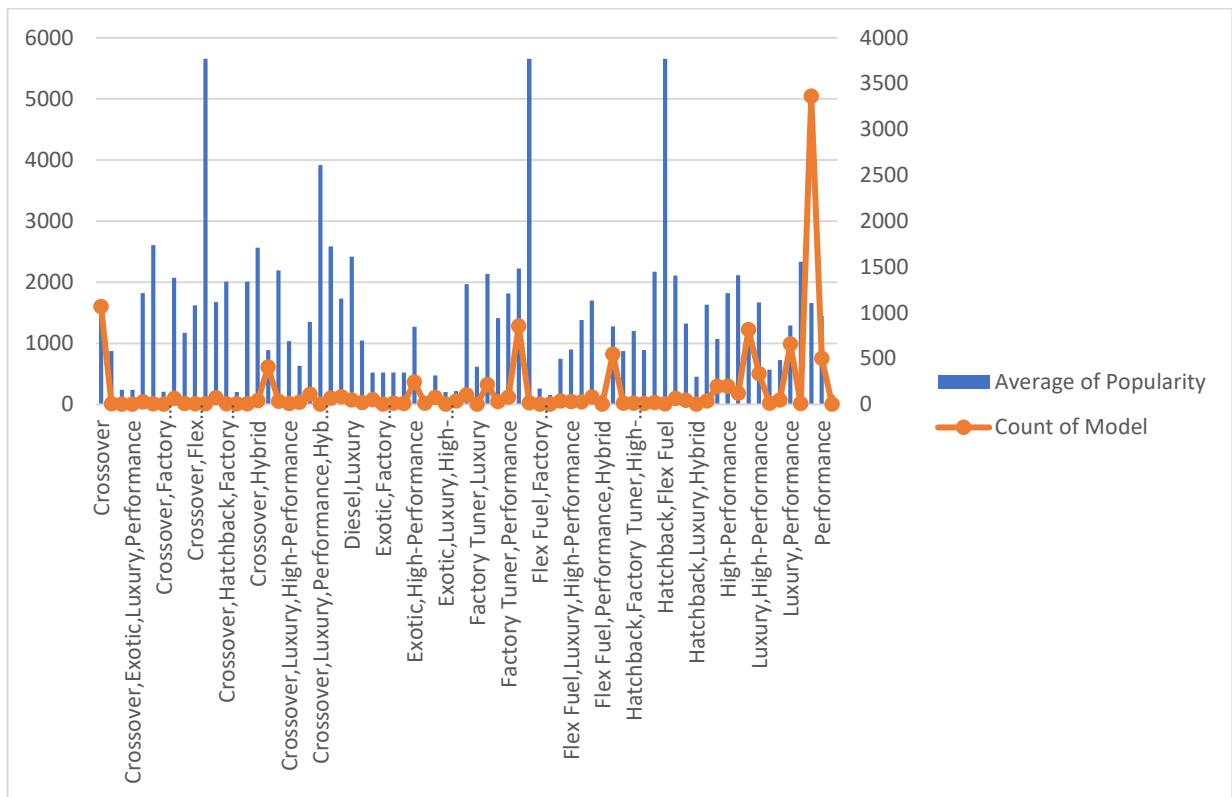
Insights and Tasks for Data Analysis

Insight Required: How does the popularity of a car model vary across different market categories?

****1. Variation of Car Model Popularity Across Market Categories:****

-Task 1.A: Create a pivot table showing the number of car models in each market category and their popularity scores.

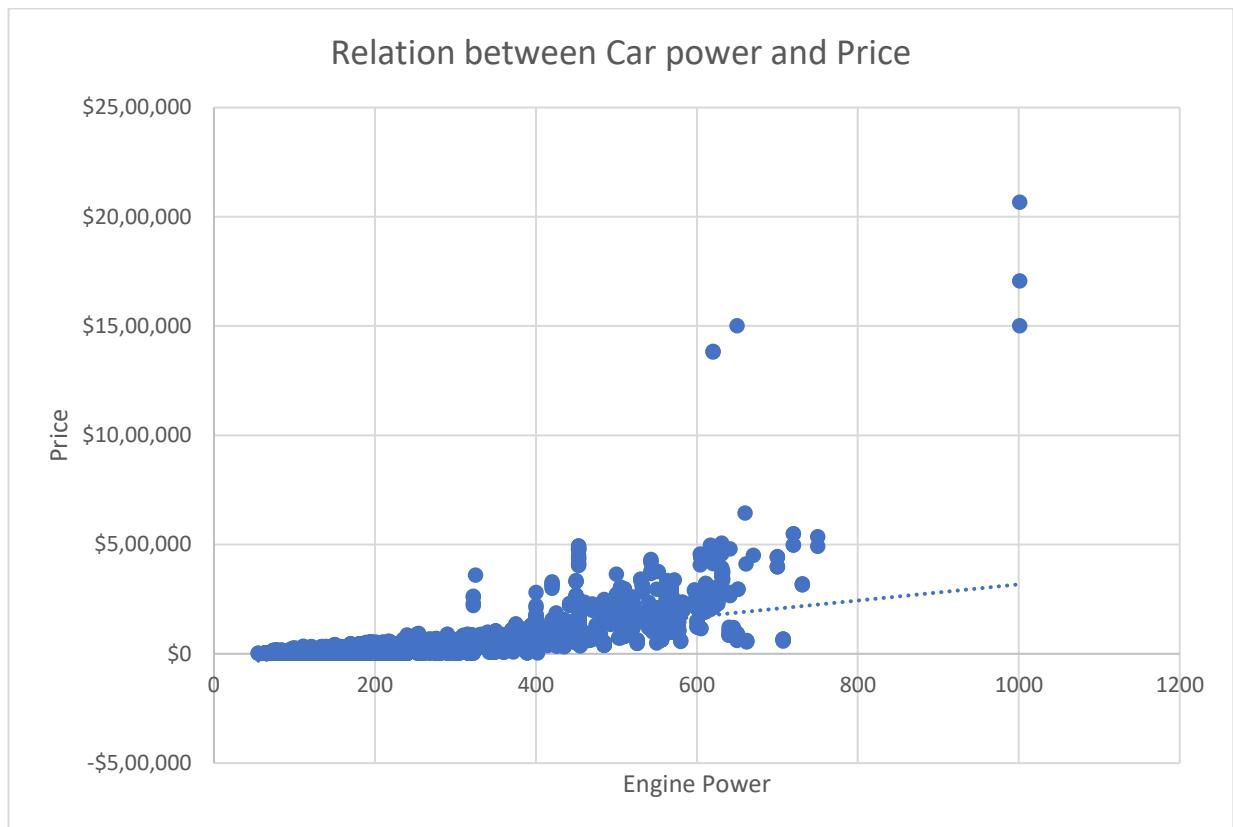
-Task 1.B: Generate a combo chart to visualize the relationship between market category and popularity.



Insight Required: What is the relationship between a car's engine power and its price?

2. Relationship Between Engine Power and Price:

-Task 2: Create a scatter chart plotting engine power (x-axis) against price (y-axis) with a trendline to illustrate their relationship.

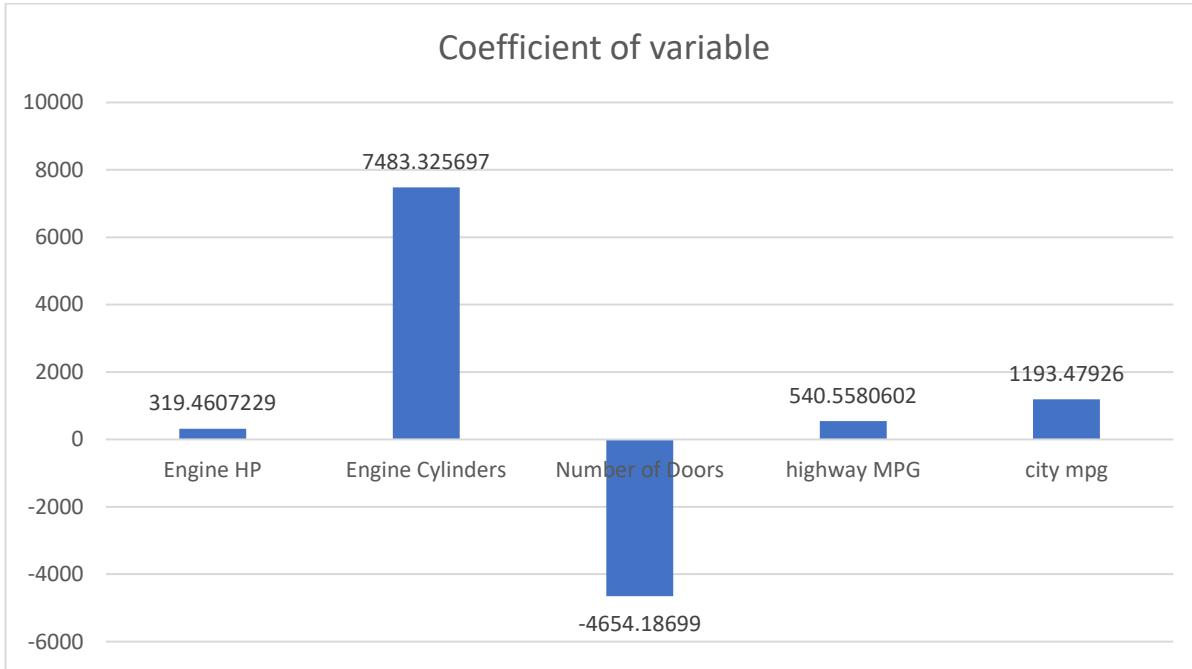


Result: If engine power increases price will also increase so we can both have a positive relationship between them.

Insight Required: Which car features are most important in determining a car's price?

3. Determinants of Car Price:

-Task 3: Perform regression analysis to identify key variables influencing car price. Create a bar chart to display the coefficient values, highlighting their relative importance.

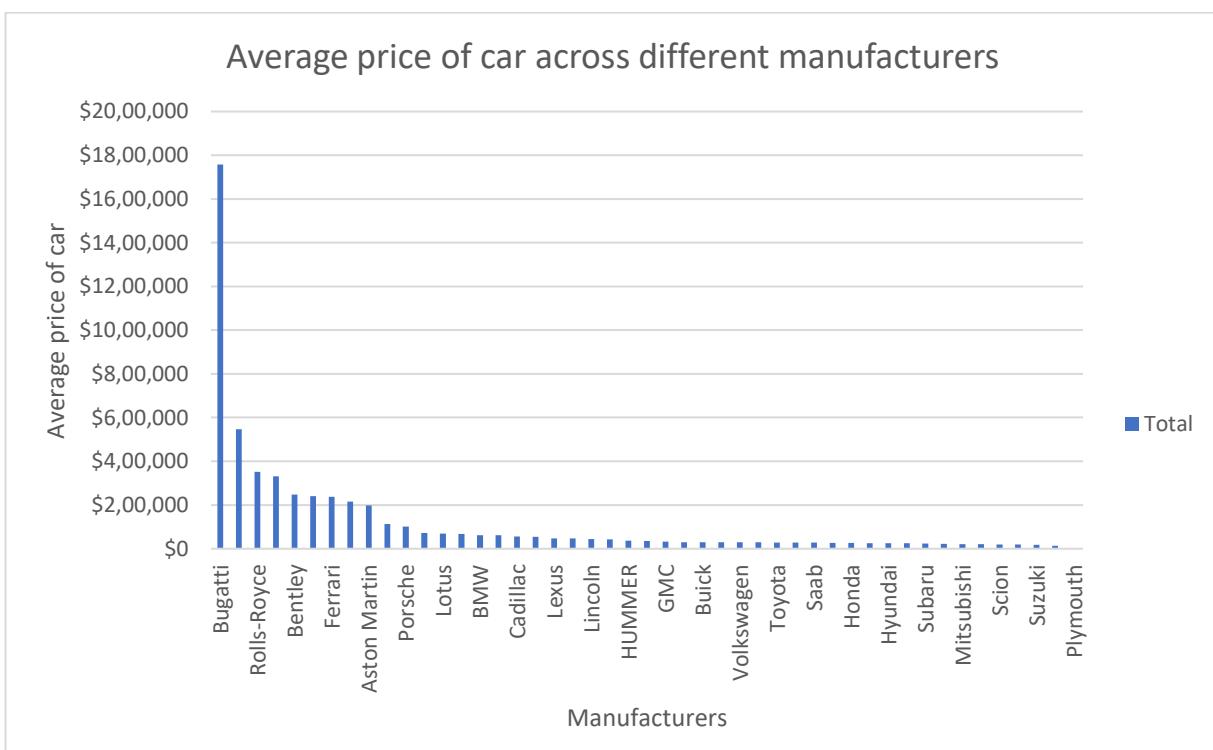


Insight Required: How does the average price of a car vary across different manufacturers?

****4. Average Car Price by Manufacturer:****

-Task 4.A: Create a pivot table showing the average price of cars for each manufacturer.

-Task 4.B: Generate a bar chart or horizontal stacked bar chart to visualize the relationship between manufacturer and average price.



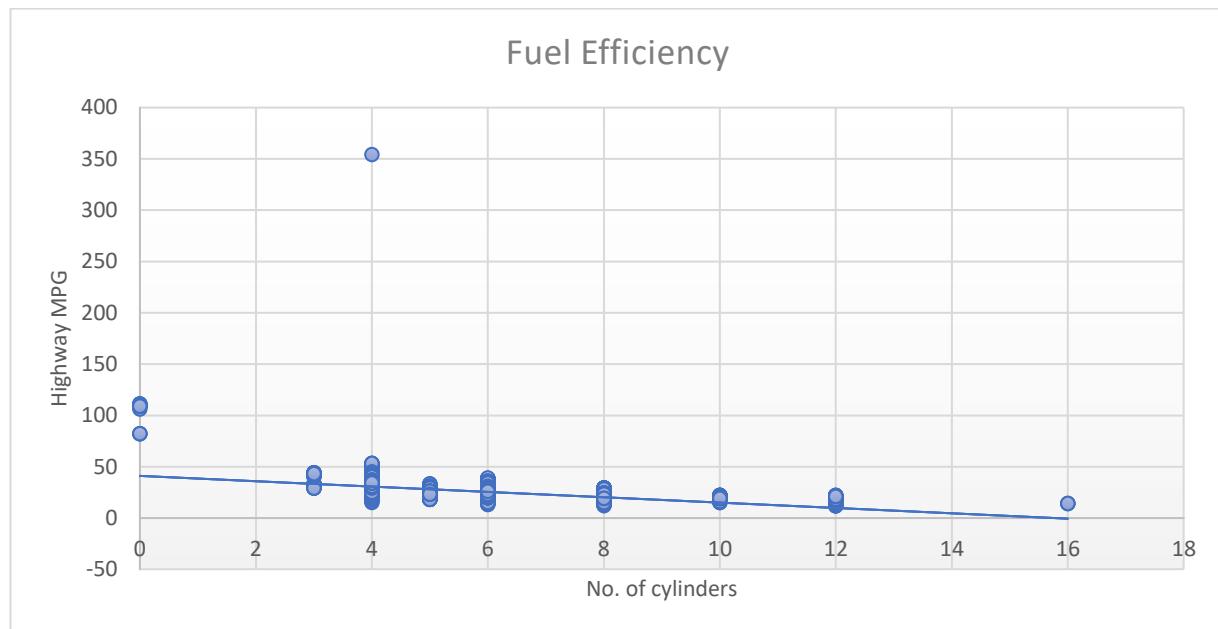
Result: Bugatti has the highest average price.

Insight Required: What is the relationship between fuel efficiency and the number of cylinders in a car's engine?

****5. Relationship Between Fuel Efficiency and Engine Cylinders:****

-Task 5.A: Create a scatter plot with the number of cylinders (x-axis) and highway MPG (y-axis), adding a trendline to assess the relationship.

-Task 5.B: Calculate the correlation coefficient between the number of cylinders and highway MPG to quantify the strength and direction of the relationship.



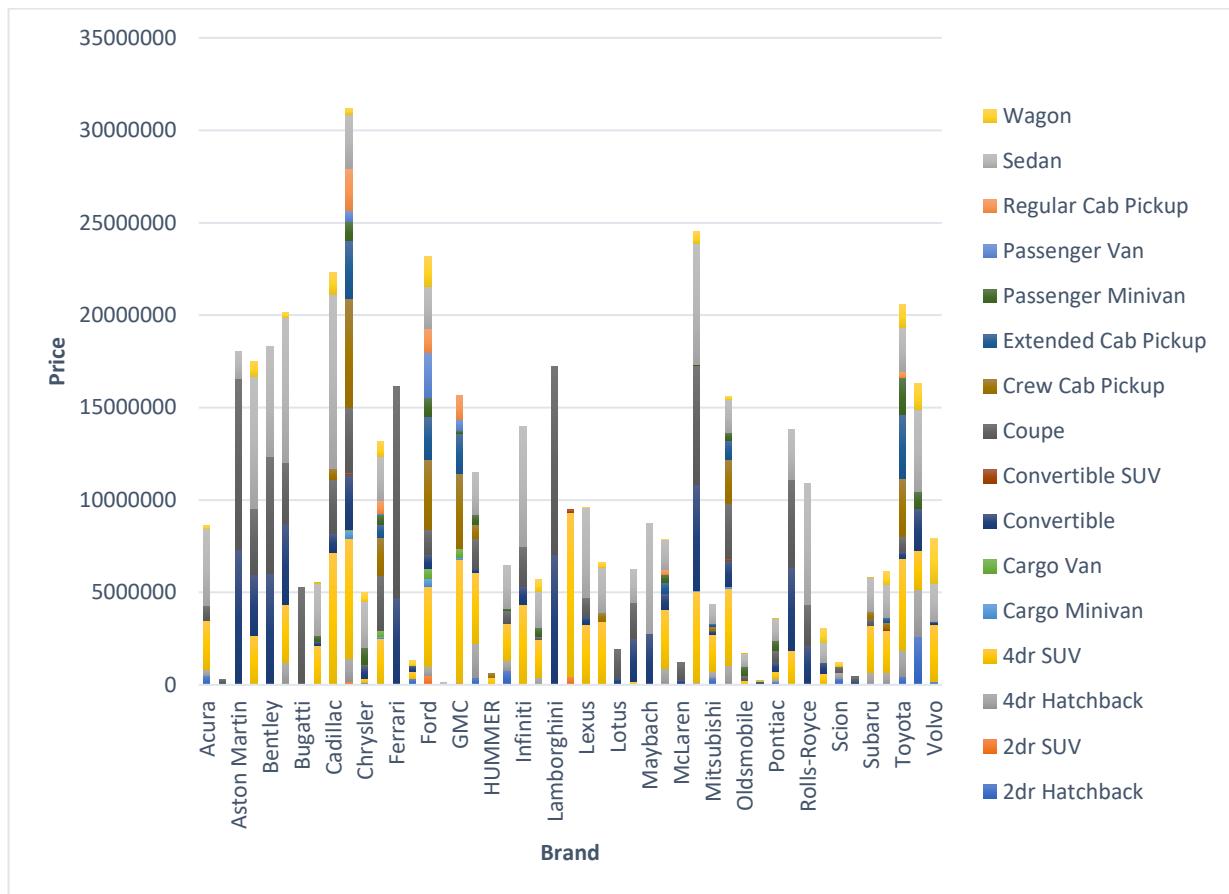
Result: As we can see here if the no of cylinders increases highway mpg will decreases so we can say that both have a negative relationship between them.

Creating the Interactive Dashboard:

For the next phase of the project, you need to develop an Interactive Dashboard.

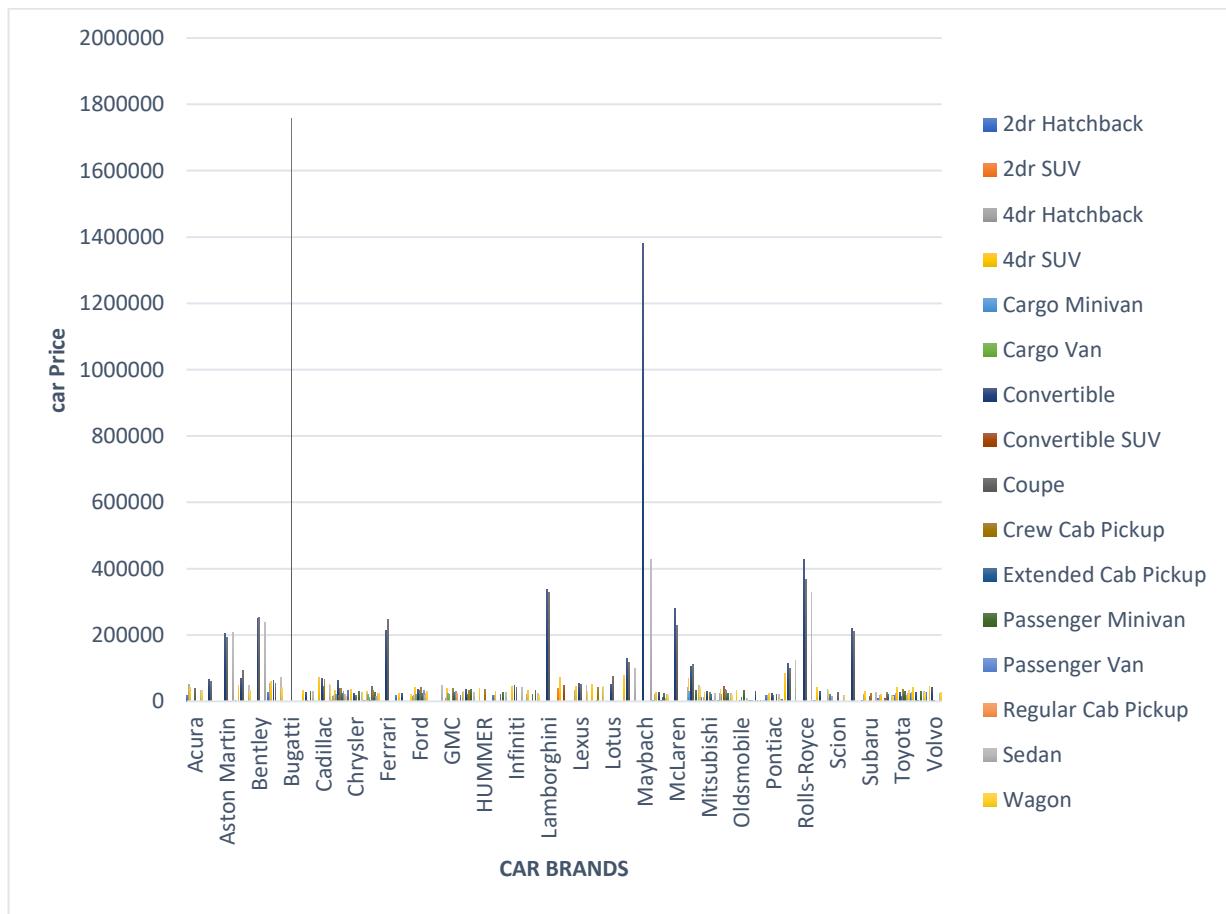
Incorporate filters and slicers to enhance chart interactivity. The client has requested the following questions be addressed:

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



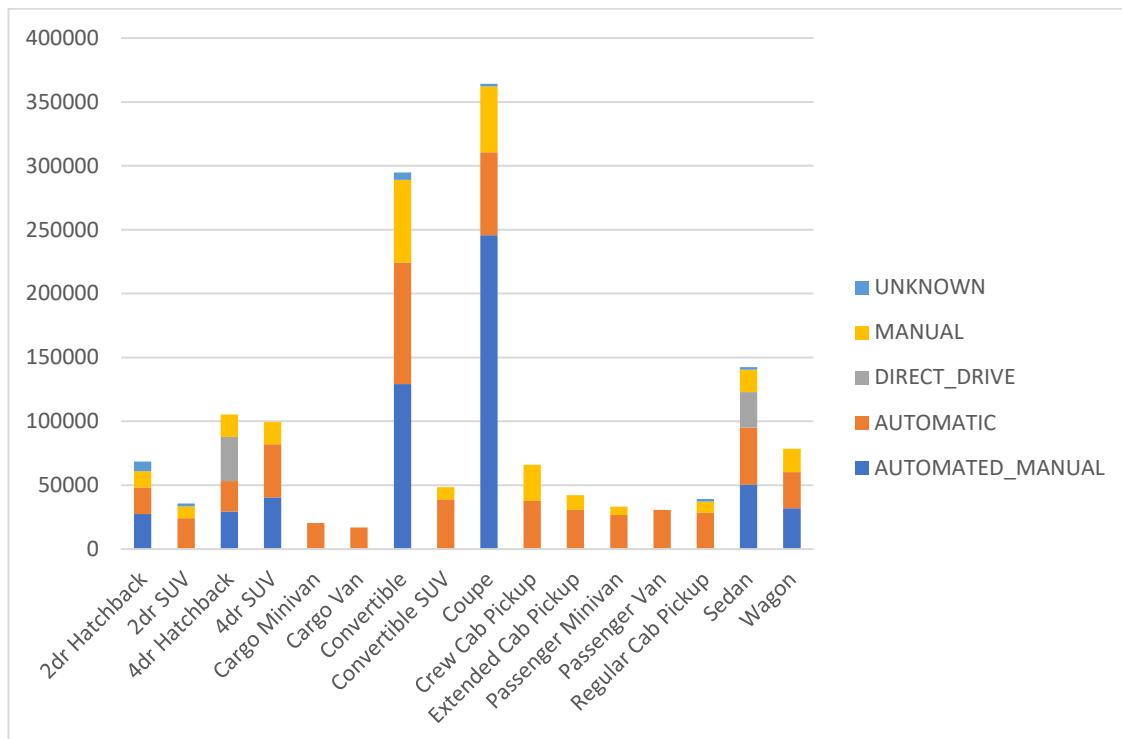
Result: Chevrolet has the highest price distribution

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



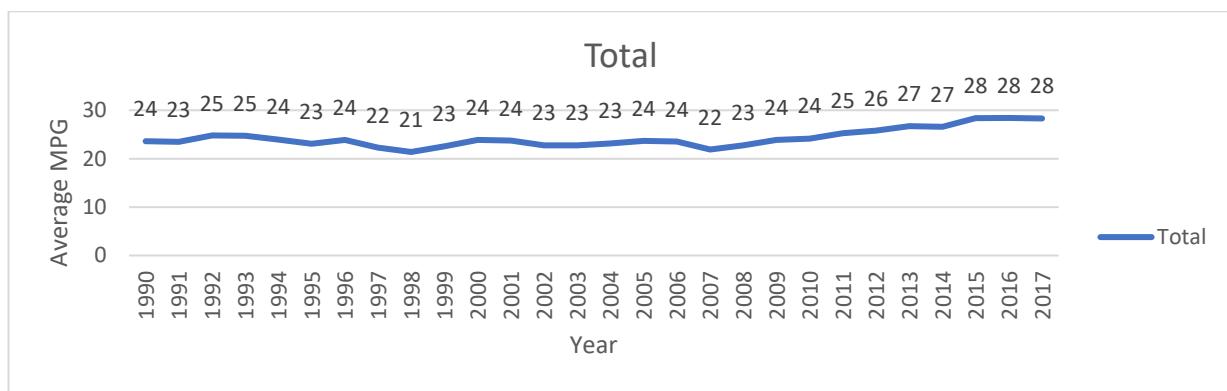
Result: Bugatti has the highest MSRP and Plymouth has the lowest Average MSRP

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



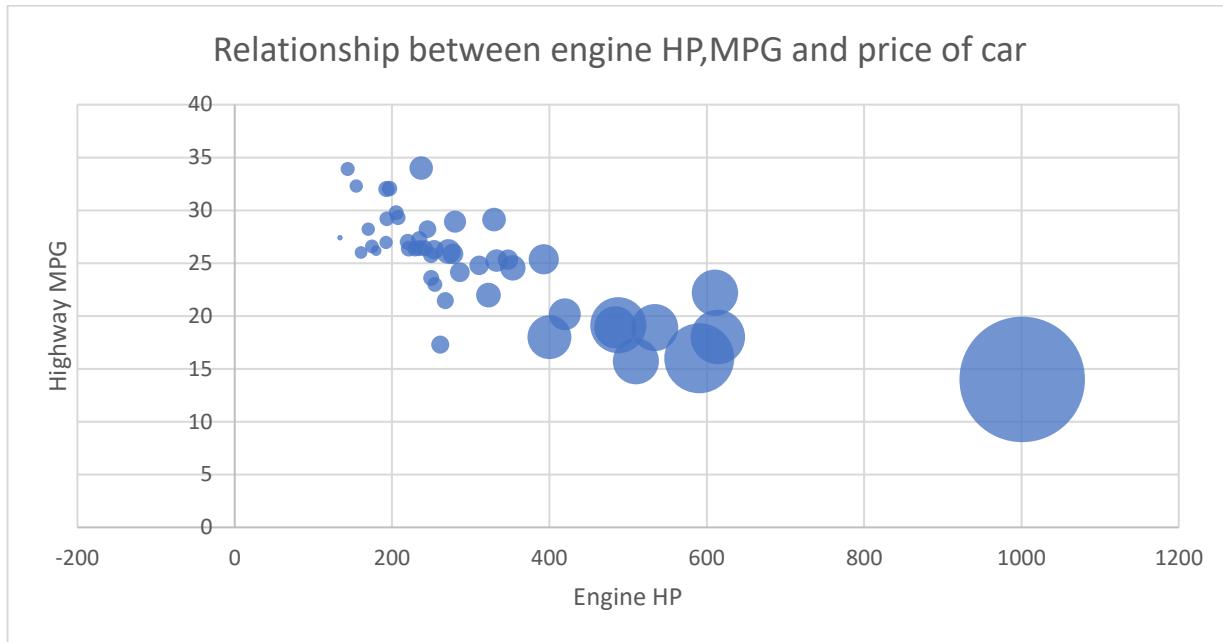
Result: **Automated_manual Coupe** is the most expensive category and the most popular also.

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



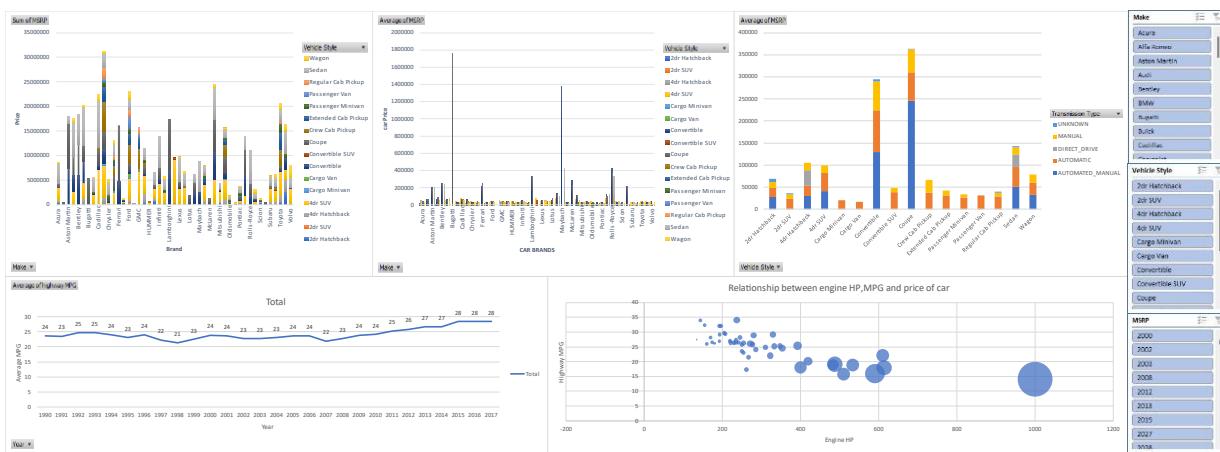
Result: Over the year fuel efficiency is increasing at a slow speed.

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



Result: If engine hp increases highway mpg will decrease and the price will also increase.

DASHBOARD



Click on this link to see my full analysis:

[My Analysis file](#)

Result –

- Coupe body style contributing maximum in car's MSRP.
- In transmission type automated_manual creating high impact because in a single car having both automated and
- manual gear system will more beneficial rather than single gear system.
- Companies needs to produce high or at least good fuel efficiency of cars by which majority of the class can afford a car.
- Overall, fuel efficiency and Coupe body style features highly impacting the car price and profitability.