Analyzing the Impact of Car Features on Price and Profitability

DESCRIPTION OF PROJECT


- The automotive industry has been rapidly evolving over the past few decades, with a growing focus on fuel efficiency, environmental sustainability, and technological innovation. With increasing competition among manufacturers and a changing consumer landscape, it has become more important than ever to understand the factors that drive consumer demand for cars.
  In recent years, there has been a growing trend towards electric and hybrid vehicles and increased interest in alternative fuel sources such as hydrogen and natural gas. At the same time, traditional gasoline-powered cars remain dominant in the market, with varying fuel types and grades available to consumers.
  For the given dataset, as a Data Analyst, the client has asked How can a car manufacturer optimize pricing and product development decisions to maximize profitability while meeting consumer demand?
  This problem could be approached 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 most profitable for the manufacturer. By using data analysis techniques such as regression analysis and market segmentation, the manufacturer could develop a pricing strategy that balances consumer demand with profitability and identify which product features to focus on in future product development efforts. This could help the manufacturer improve its competitiveness in the market and increase its profitability over time.

Task 1 : HOW DOES THE POPULARITY OF A CAR MODEL VARY ACROSS DIFFERENT MARKET CATEGORIES?

• Here I have Created a Pivot Table Showing Number of car models in each market category and their corresponding popularity scores.

• Below Chart visualizes the relationship between market category and popularity.
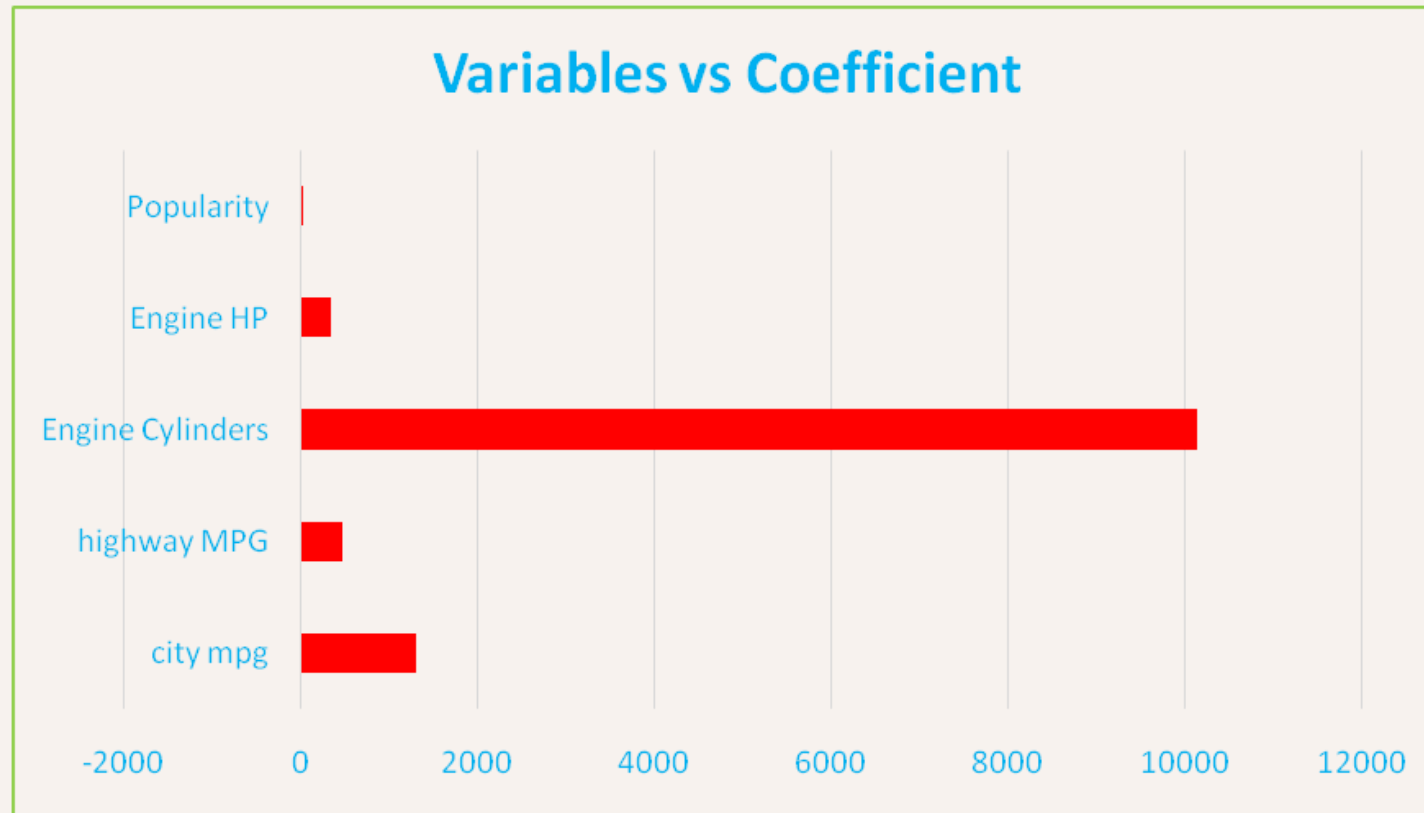
AVERAGE of Popularity

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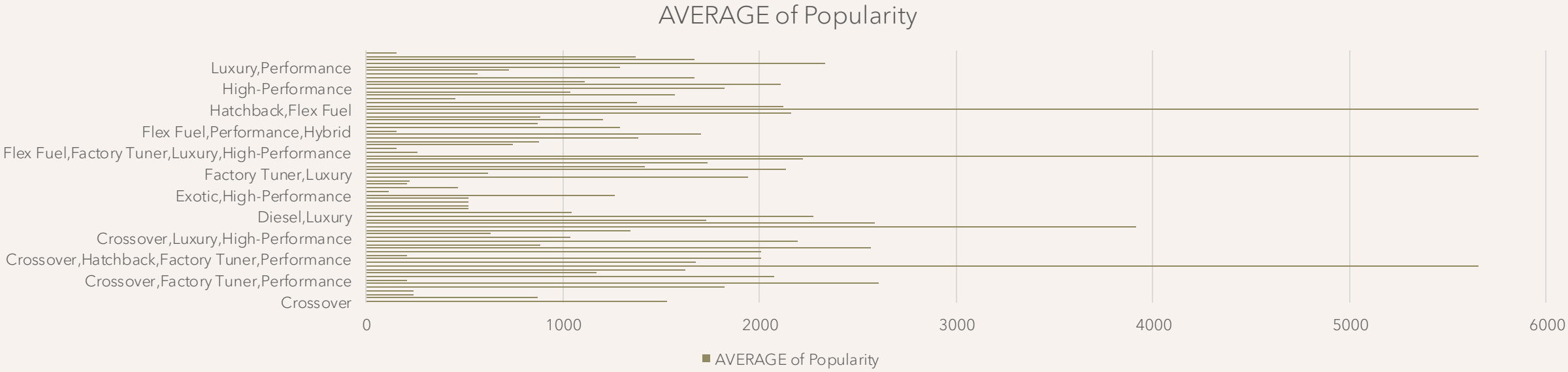
Task 2 : WHAT IS THE RELATIONSHIP BETWEEN A CAR'S ENGINE POWER AND ITS PRICE?

- Here I have Created a Scatter Plot to Visualize relationship between Engine Power & Price.

- Here I Have Plotted Price on Y Axis & Power on X Axis

Engine Power vs Price
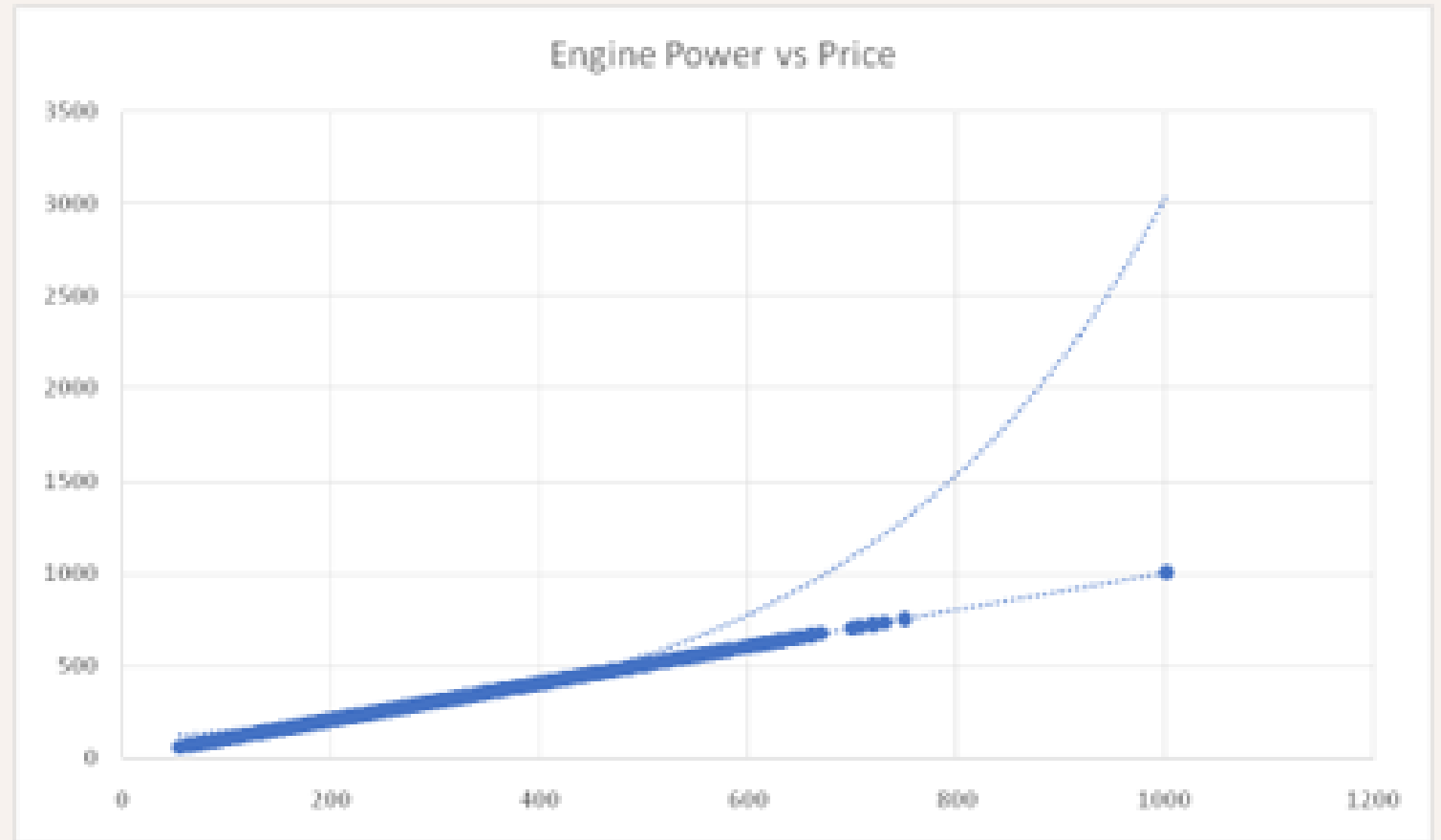
Task 3 : WHICH CAR FEATURES ARE MOST IMPORTANT IN DETERMINING A CAR'S PRICE?

- For This Task I Have Used Regression Analysis to identify the variables that have the strongest relationship with a car's price.

Task 4 : HOW DOES THE AVERAGE PRICE OF A CAR VARY ACROSS DIFFERENT MANUFACTURERS?

- For this task I Have Created a Pivot Table that shows the average price of cars for each manufacturer

- Creation of horizontal stacked bar chart that visualizes the relationship between manufacturer and average price.

Manufacturer vs Avg Price
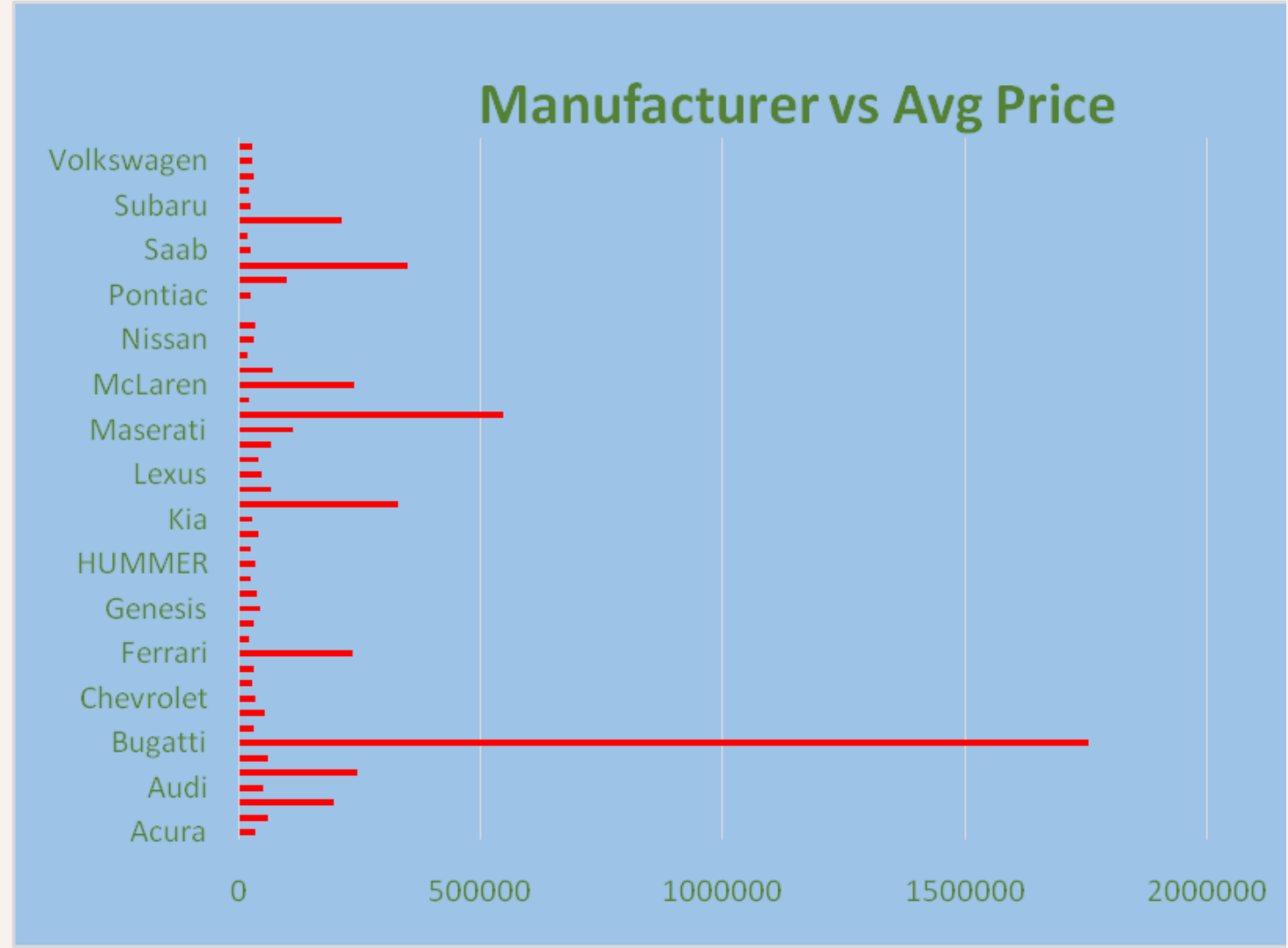
Task 5 : WHAT IS THE RELATIONSHIP BETWEEN FUEL EFFICIENCY AND THE NUMBER OF CYLINDERS IN A CAR'S ENGINE?

- Create a Scatter Plot highway MPG on the y-axis. & number of cylinders on the x-axis

- Scatter Plot Trends showing decreasing exponential slope.
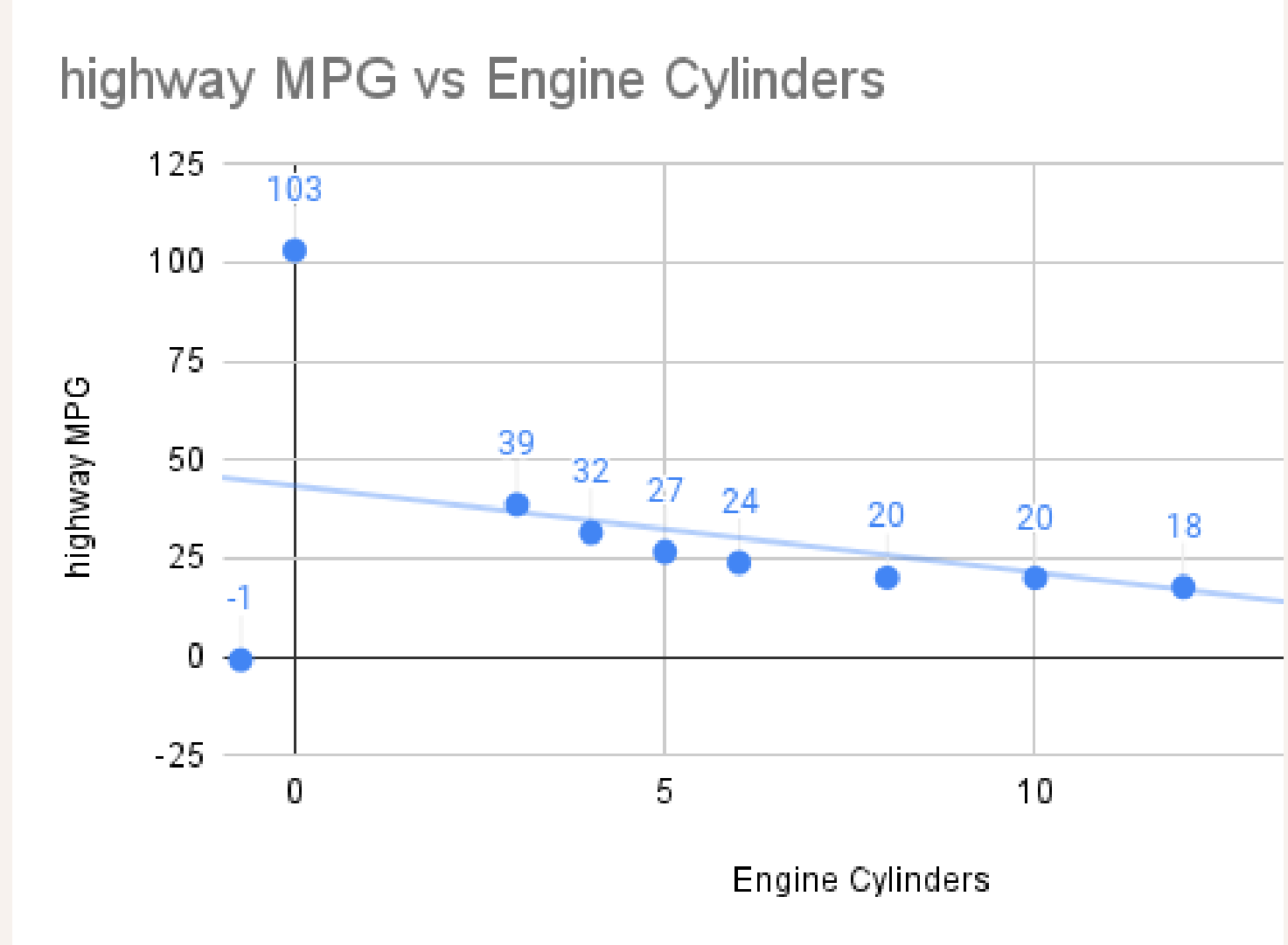
Insights That I Gained from Previous Tasks

- **For Task 1** – Chart Helped Me To Analyze Popularity of Car Model varying for each category

- **For Task 2** – Scatter Plot Showed Me Relationship between two variables is exponential & when engine power increasing the price of the car is also increasing

- **For Task 3** – Regression Analysis showed me Engine Cylinder is affecting the price of car the most because it has coefficient value within the range and also low value. & also

    significance F value as 0 showed me which means regression model is statistically significant.

- **For Task 4** – Chart is helping us to clearly visualize which car model has high average price and which one has lower average price.

    Pivot Table showed me average price for each car model. & also, We've found out that high average price with Bugatti Veyron 16.4
& Low average price = Rolls-Royce Phantom

- **For Task 5** – Mean Value -0.60332 showed me if one variable increases, the other variable decreases with the same magnitude & vice versa

    The correlation coefficient between the number of cylinders and highway MPG to quantify the strength and direction of the relationship.

Distribution of Car Prices by Brand and Body Style
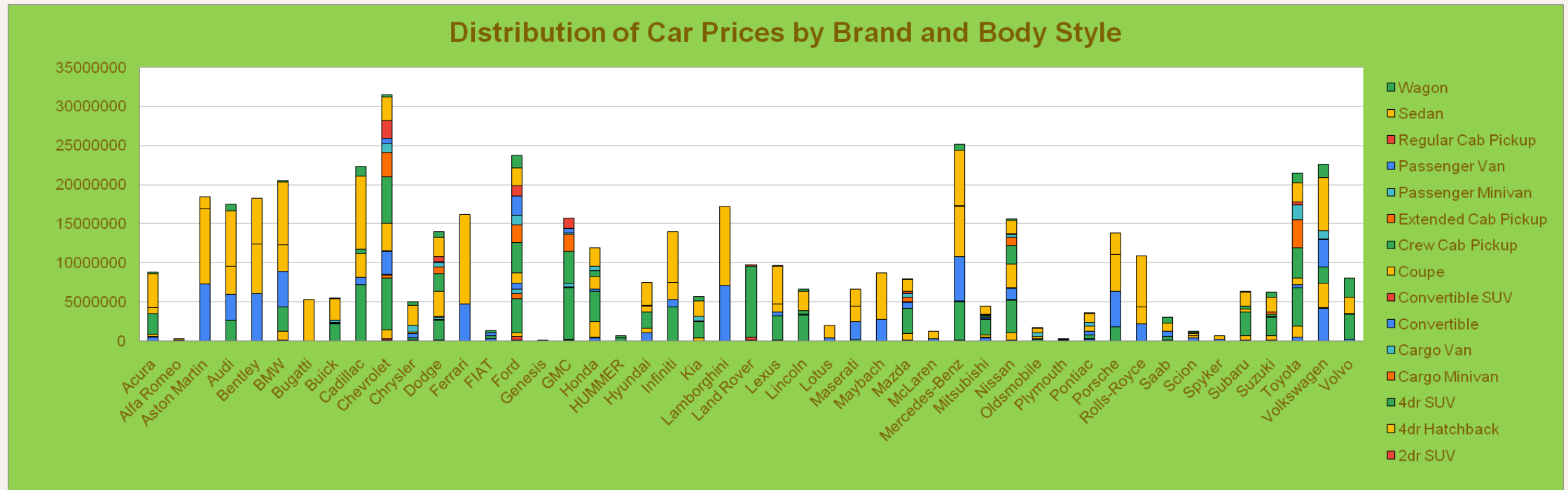
DASHBOARD TASK 1 - : How does the distribution of car prices vary by brand and body style?

- Employ a Stacked column chart and integrated filters and slicers to enhance its interactivity.

  & represent the distribution of car prices by brand and body style.

- Compute Total MSRP for each brand and body style by using pivot tables.

Distribution of Average Car Prices by Car Brand and Body Style
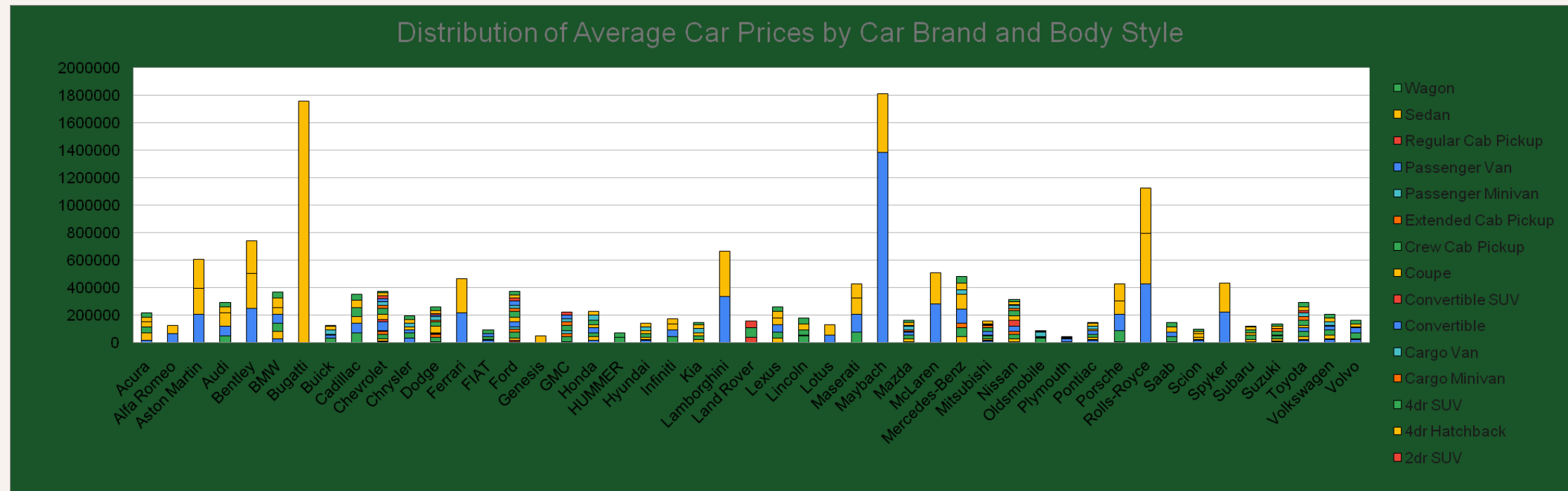
DASHBOARD Task 2: Which car brands have the highest and lowest average MSRPs, and how does this vary by body style?

- To Contrast the mean MSRP Values among diverse body styles & car brands create a column chart.

- Compute the average MSRP for each brand and body style employ pivot table

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

- To represent the correlation between MSRP and transmission type create a scatter plot with distinct symbols assigned to each body style. Additionally, I computed the mean MSRP for every combination of transmission type and body style using a Pivot Table.
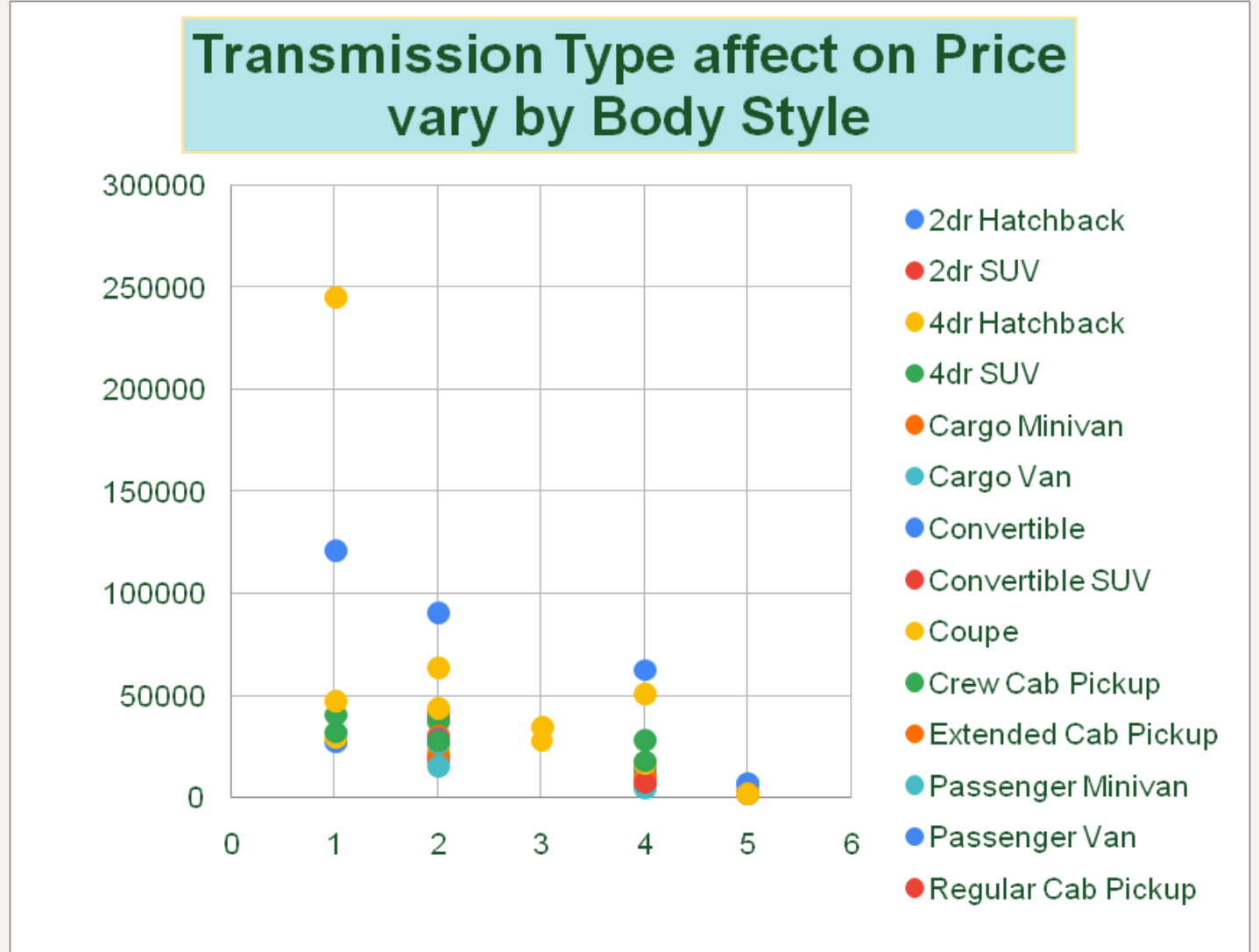
DASHBOARD **Task 4:** How does the fuel efficiency of cars vary across different body styles and model years?

- To Show the Fuel Efficiency Trend for each body style over time create a Line Chart

- Computed the mean MPG for every combination of body style and model year using a Pivot Table.

Fuel Efficiency of cars with different body styles throughout the Years
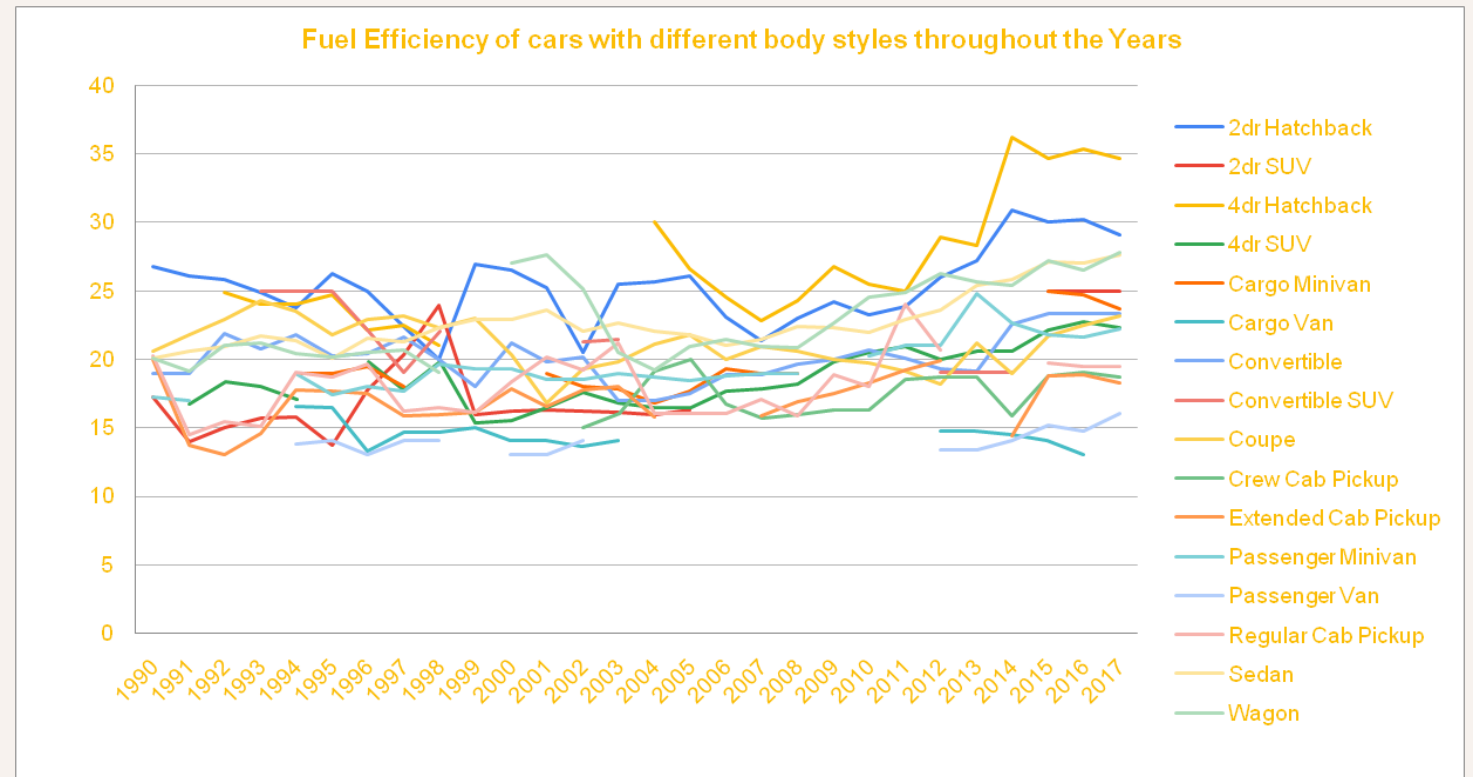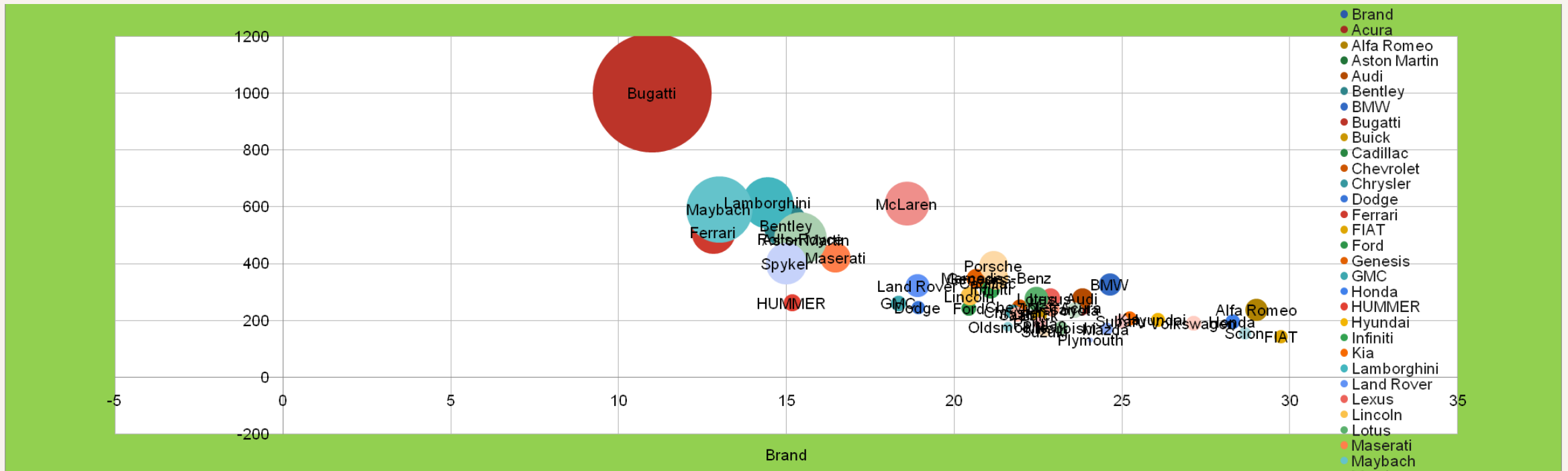
DASHBOARD **Task 5:** How does the car's horsepower, MPG, and price vary across different Brands?

- To demonstrate the correlation between horsepower, MPG, and price for distinct car brands Construct a Bubble Chart each brand was assigned a different color, and the car model name was used to label the bubbles.to compute the mean horsepower, MPG, and MSRP for each car brand employ Pivot Table

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THANK YOU

Please Find Below the Sheet :

Impact of Car Analysis Excel Tasks