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 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

Tech – Stack Used

- Excel 2021
- Power Point

The Approach

- Understanding Data: Getting a thorough understanding of data and what impact does it have on the target.
- Cleaning: Handling irregularities in data for better analysis
- Analysis: Analyzing the data to drew insights and conclusion
- Visulaization:Visualize the analysis and create a dashboard

Data Cleaning

- Remove all the null values by dropping the whole row
- Delete duplicate rows
- Add dollar sign with MSRP values
- Correct the formatting of each column
- Replace the cells with the “UNKNOWN” value in the column ‘Transmission Type with its mode i.e.,. Automatic

Data Analysis

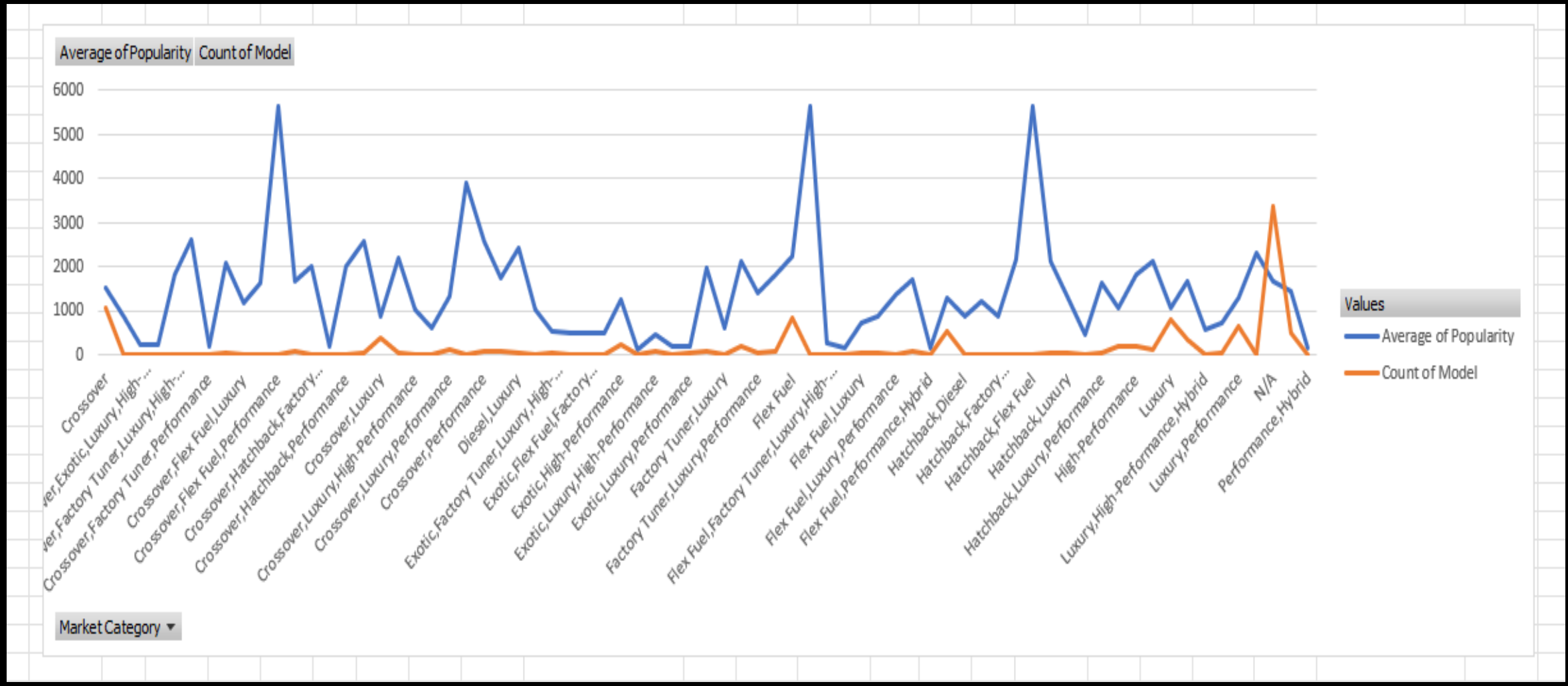
- Analyzing the data & extracting the meaningful insights from data using formulas or pivot tables.

Data Visualization

- After data analysis we use that data to represent graphically on chart.
- Also we create a dashboard based on the requirement.

Task 1: popularity of a car model vary across different market categories?

- Task 1.A: Create a pivot table that shows the number of car models in each market category and their corresponding popularity scores. ●
- Task 1.B: Create a combo chart that visualizes the relationship between market category and popularity.

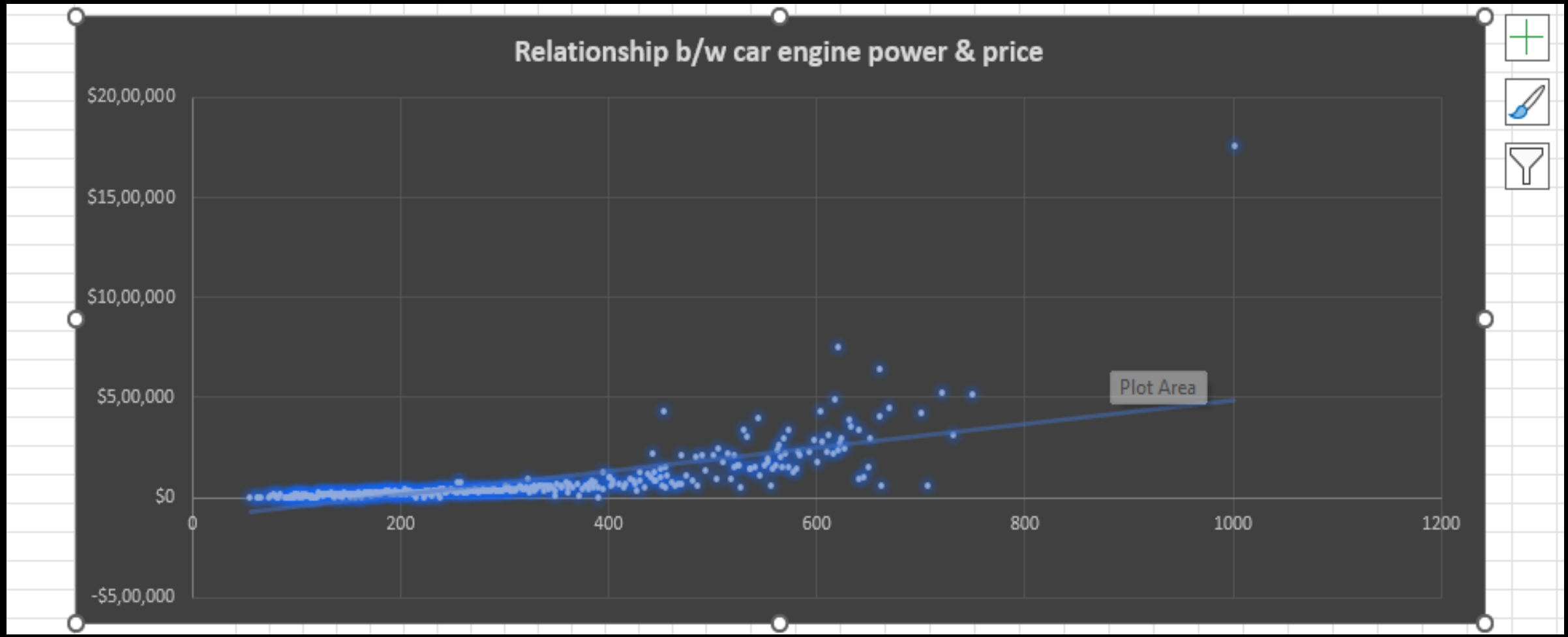


Insights:

From the chart we can clearly observe that crossover,Flex Fuel,Diesel,Hatch Back are most popular in the market and crossover has the highest selling cars.

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

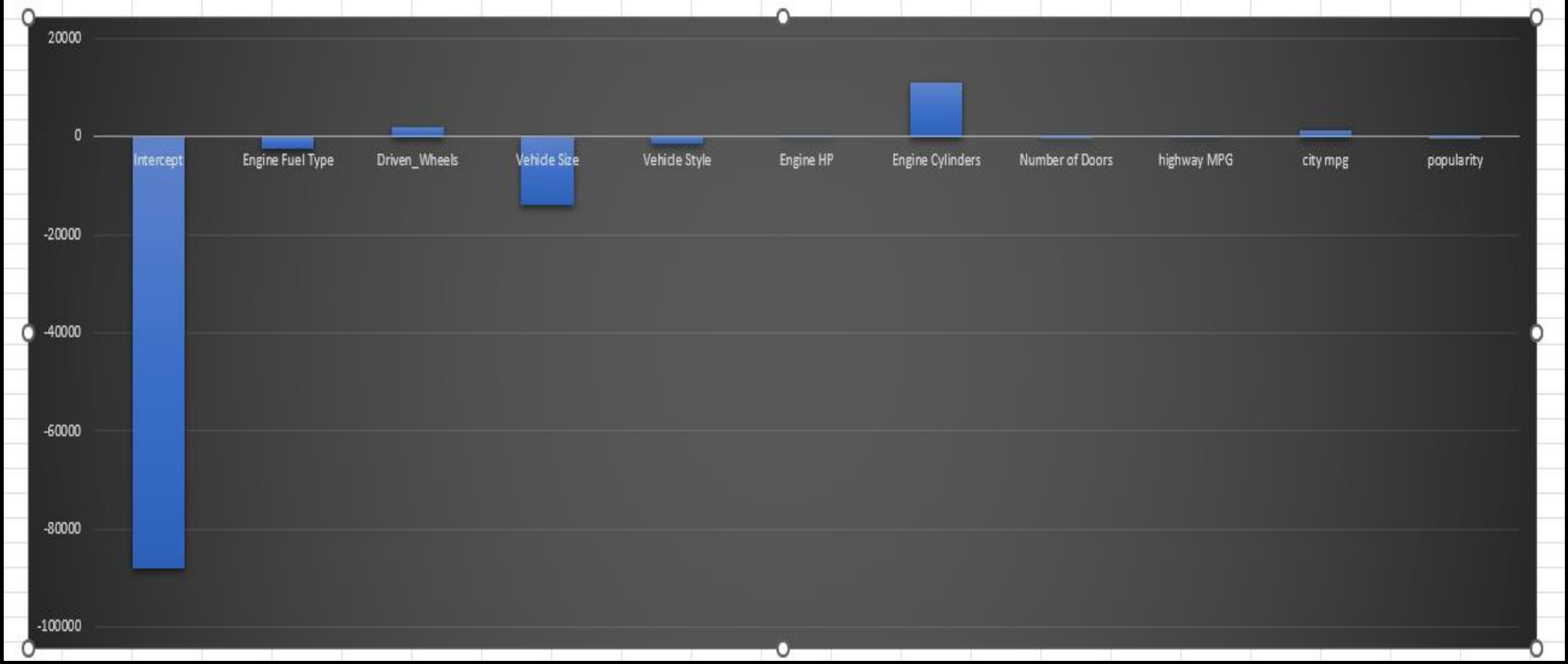
- Task 2: Create a scatter chart that plots engine power on the x-axis and price on the y-axis. Add a trendline to the chart to visualize the relationship between these variables



- Insights:
- Engine power and MSRP have a positive relation.
- Thus Increasing the price with the increase of car engine power.

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

- Task 3: Use regression analysis to identify the variables that have the strongest relationship with a car's price. Then create a bar chart that shows the coefficient values for each variable to visualize their relative importance.

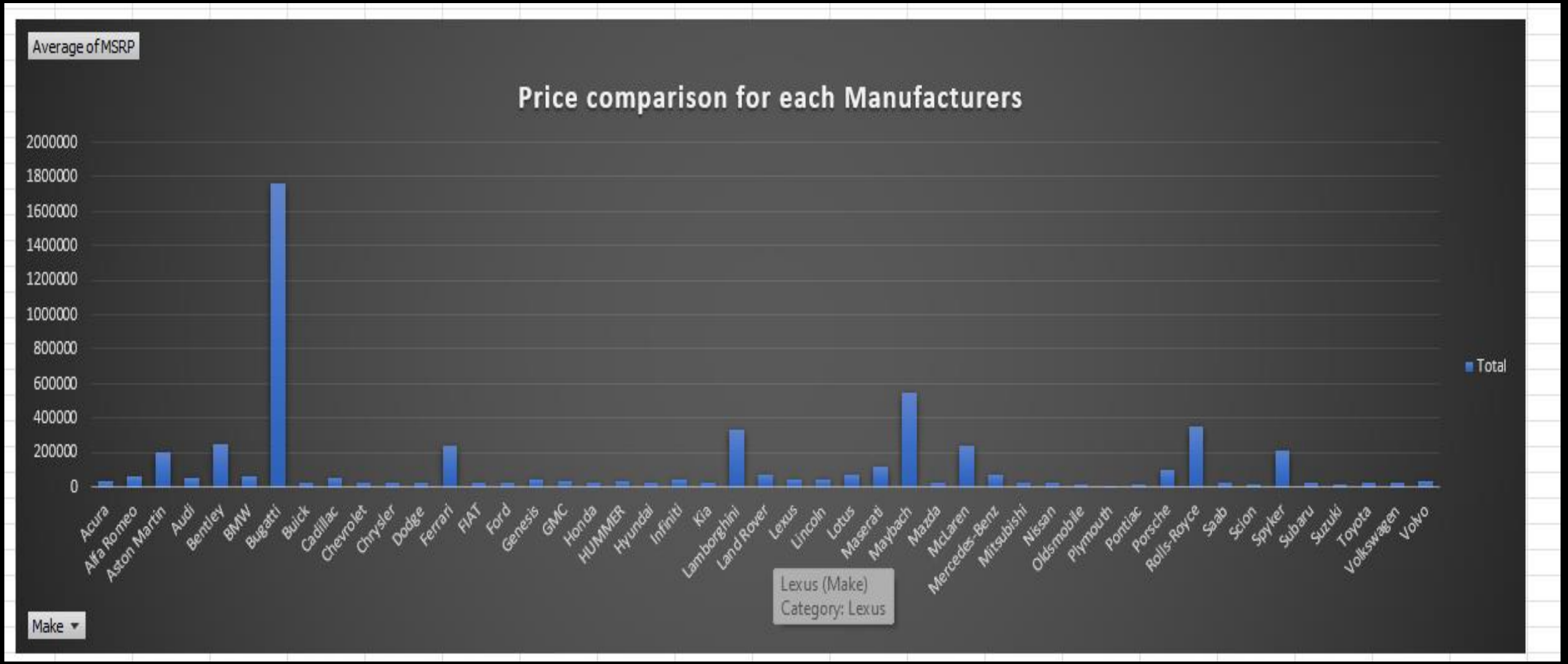


Insights:

Engine cylinder are most important in determining the car price.

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

- Task 4.A: Create a pivot table that shows the average price of cars for each manufacturer.
- Task 4.B: Create a bar chart or a horizontal stacked bar chart that visualizes the relationship between manufacturer and average price.

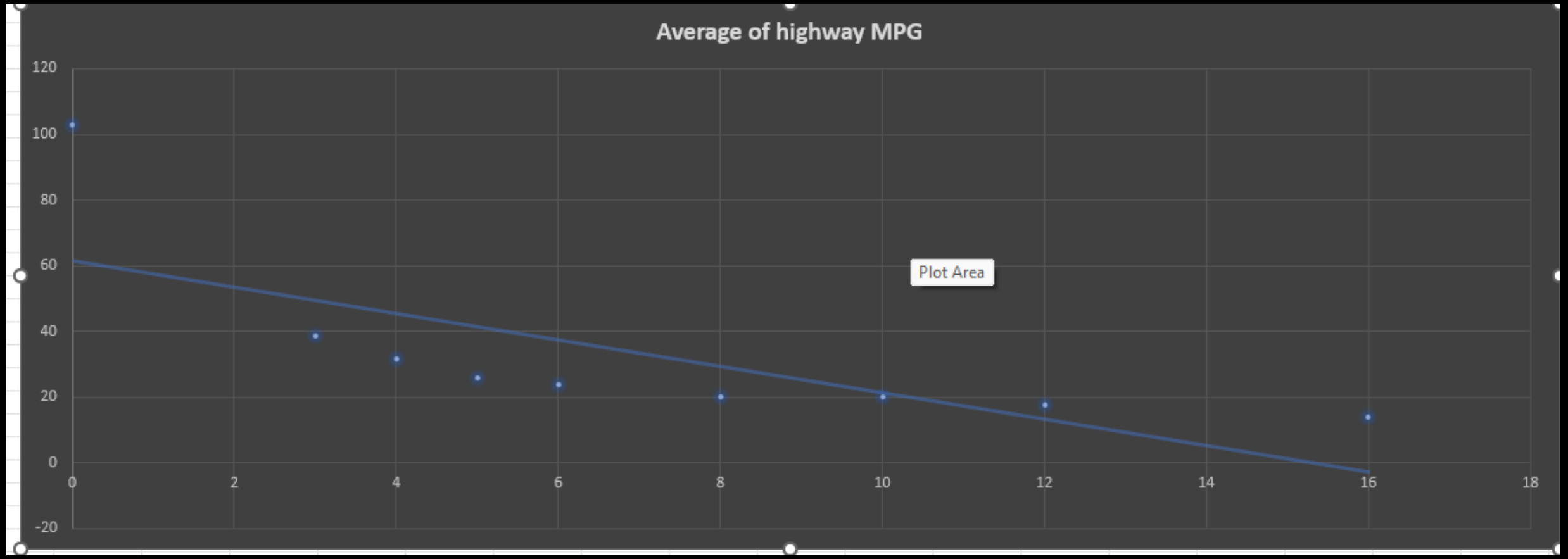


Insights:

From the chart we can observe that Bugatti have the highest average car price.

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

- Task 5.A: Create a scatter plot with the number of cylinders on the x-axis and highway MPG on the y-axis. Then create a trendline on the scatter plot to visually estimate the slope of the relationship and assess its significance.
- Task 5.B: Calculate the correlation coefficient between the number of cylinders and highway MPG to quantify the strength and direction of the relationship.



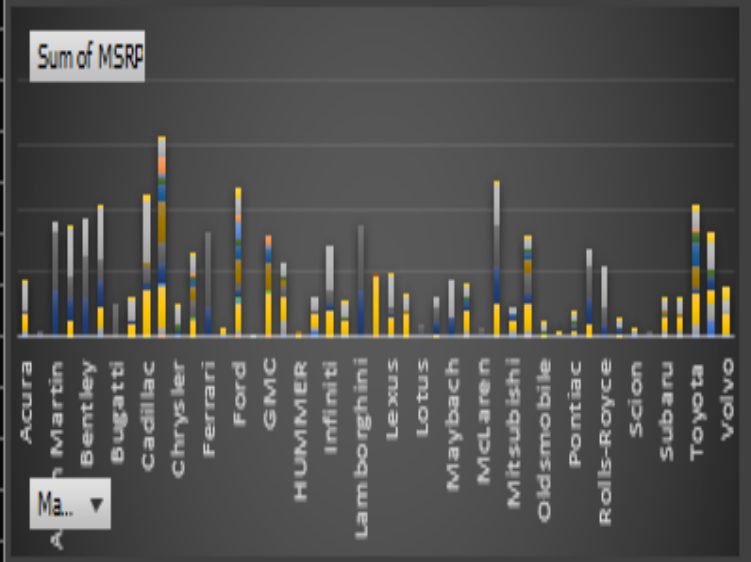
Insights:

It is quite visible that as the number of cylinders increases the efficiency decreases.

And the correlation coefficient value is -0.614703148

Building the Dashboard:

- Now for the Next portion of the Project, you need to create the Interactive Dashboard. Use filters and slicers to make the chart interactive. The client has requested these questions given below:


Sum of MSRP
Acura
Aston Martin
Bentley
Bugatti
Cadillac
Chrysler
Ferrari
Ford
GMC
HUMMER
Infiniti
Lamborghini
Lexus
Lotus
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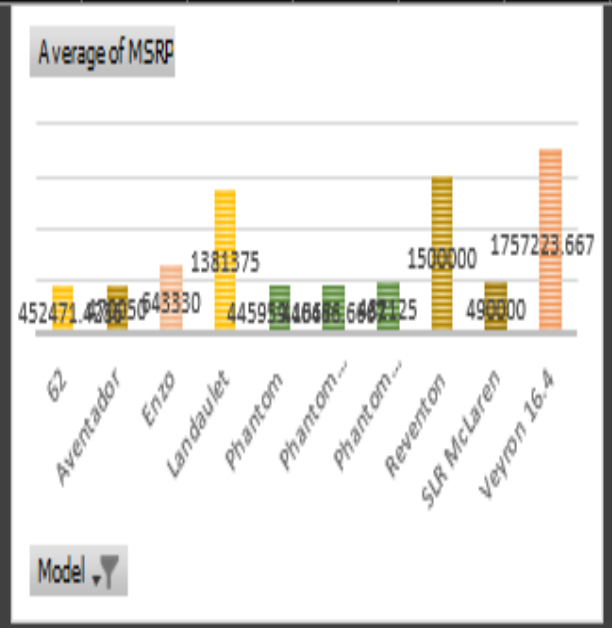
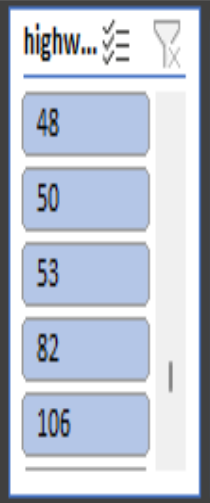
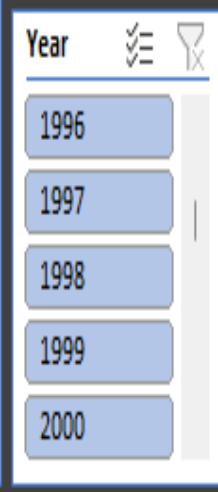
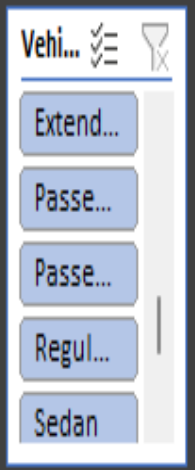
Pontiac
Rolls-Royce
Scion
Subaru
Toyota
Volvo
Ma...

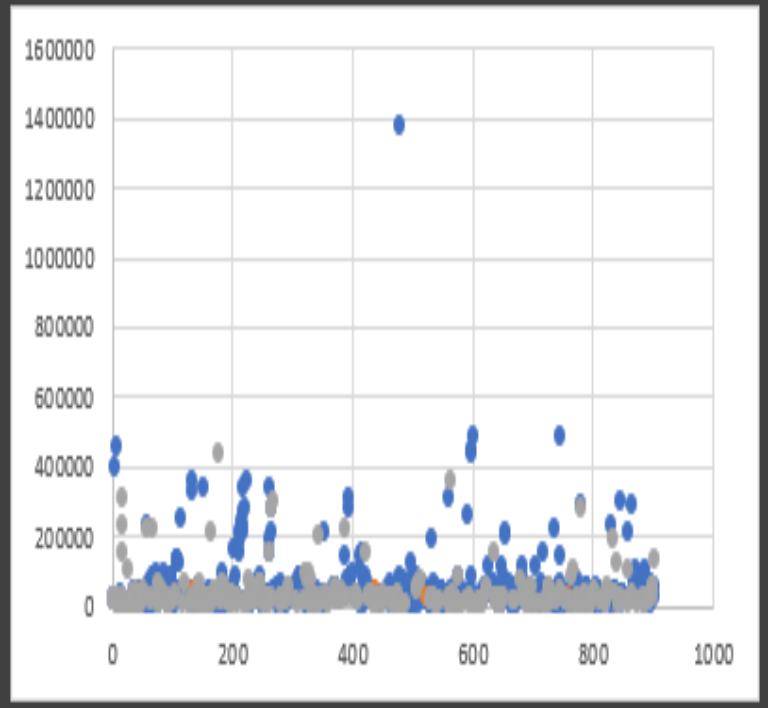

Average of MSRP
452471.4
643330
1381375
1500000
1757223.667
62
Aventador
Enzo
Landaulet
Phantom
Phantom...
Phantom...
Reventon
SLR McLaren
Veyron 16.4
Model


highw...
48
50
53
82
106


Year
1996
1997
1998
1999
2000


Row L...
allroad ...
Alpina
ALPINA ...
ALPINA B7
Altima


Vehi...
Extend...
Passe...
Passe...
Regul...
Sedan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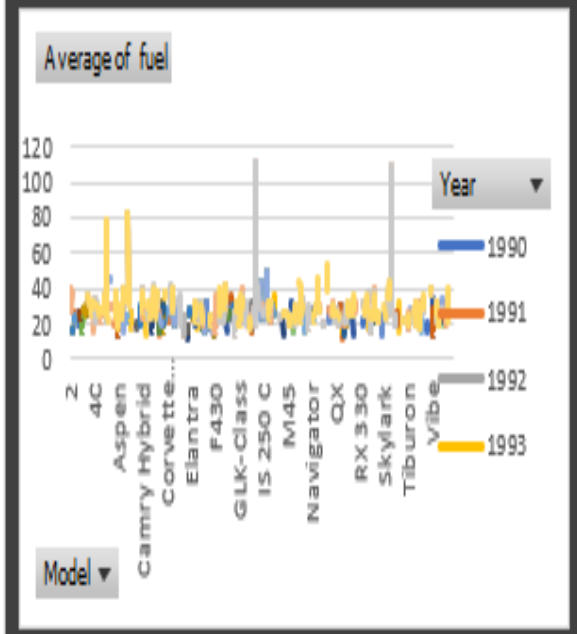
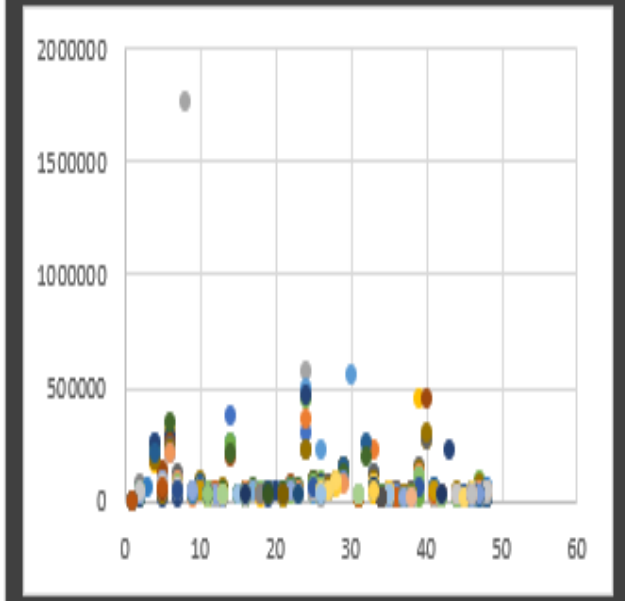
1000


Average of fuel
120
100
80
60
40
20
0
Year
1990
1991
1992
1993
2
4C
Aspen
Camry Hybrid
Corvette...
Elantra
F430
GLK-Class
IS 250 C
M45
Navigator
QX
RX 330
Skylark
Tiburon
Vibe
Model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1000000
500000
0
0
10
20
30
40
50
60

Excel Sheet HyperLink

- https://docs.google.com/spreadsheets/d/1SFS4phbHM-lAiHrzORiT-WIJpDIybRhQ/edit?usp=drivesdk&ouid=113826139200146158008&rtpof=true&sd=true

Video Hyperlink

- https://drive.google.com/file/d/1SGYtn54JVM4Ecj4cJkMUGdN_Z-Z_MvPF/view?usp=drivesdk