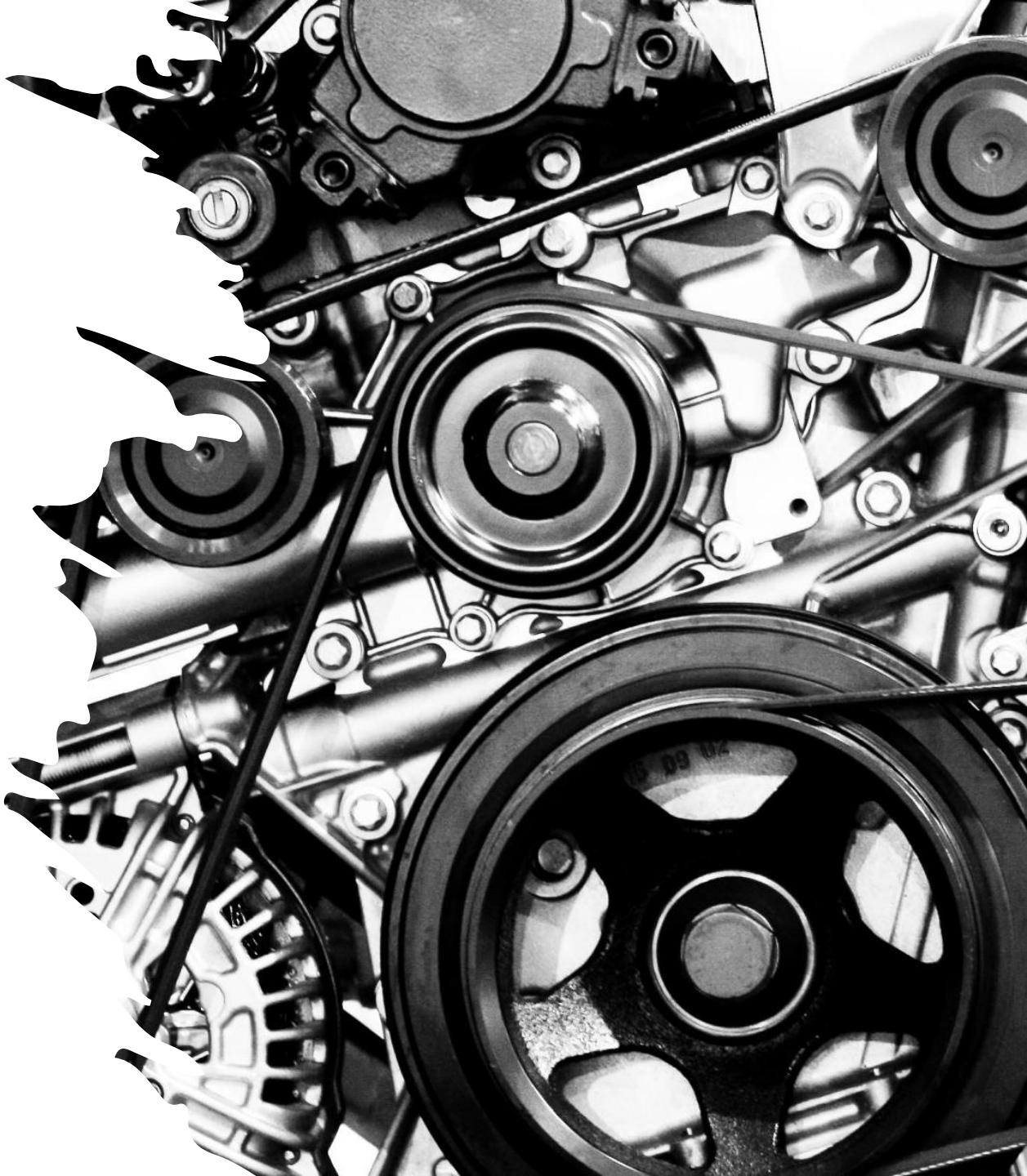
# IMPACT OF CAR FEATURES



# PROJECT DESCRIPTION

**Objective:**

This project aims to find how a car manufacturer can optimize pricing and product development decisions to maximize profitability while meeting consumer demand.

**Dataset provided:**

Rows - 11915

Columns - 16

# APPROACH

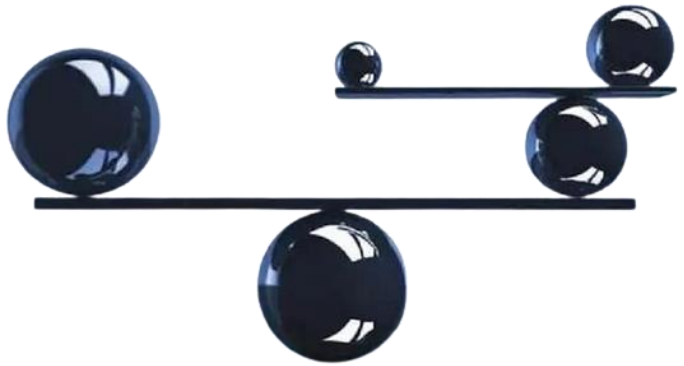
Understood the dataset provided

Performed all the given tasks in MS Excel

Created a dashboard in Tableau

Created the presentation using MS PowerPoint

Created a video to present my presentation



# TECH-STACK USED

**MS Excel (Microsoft 365 version):**
Used to analyze the dataset provided to me.

**Tableau:**
Used to create the dashboard.

**MS PowerPoint (Microsoft 365 version):**
Used to create the presentation.

# INSIGHTS

## TASKS TO PERFORM IN EXCEL

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

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

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

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

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

# INSIGHTS

## TASKS TO PERFORM TO CREATE A DASHBOARD

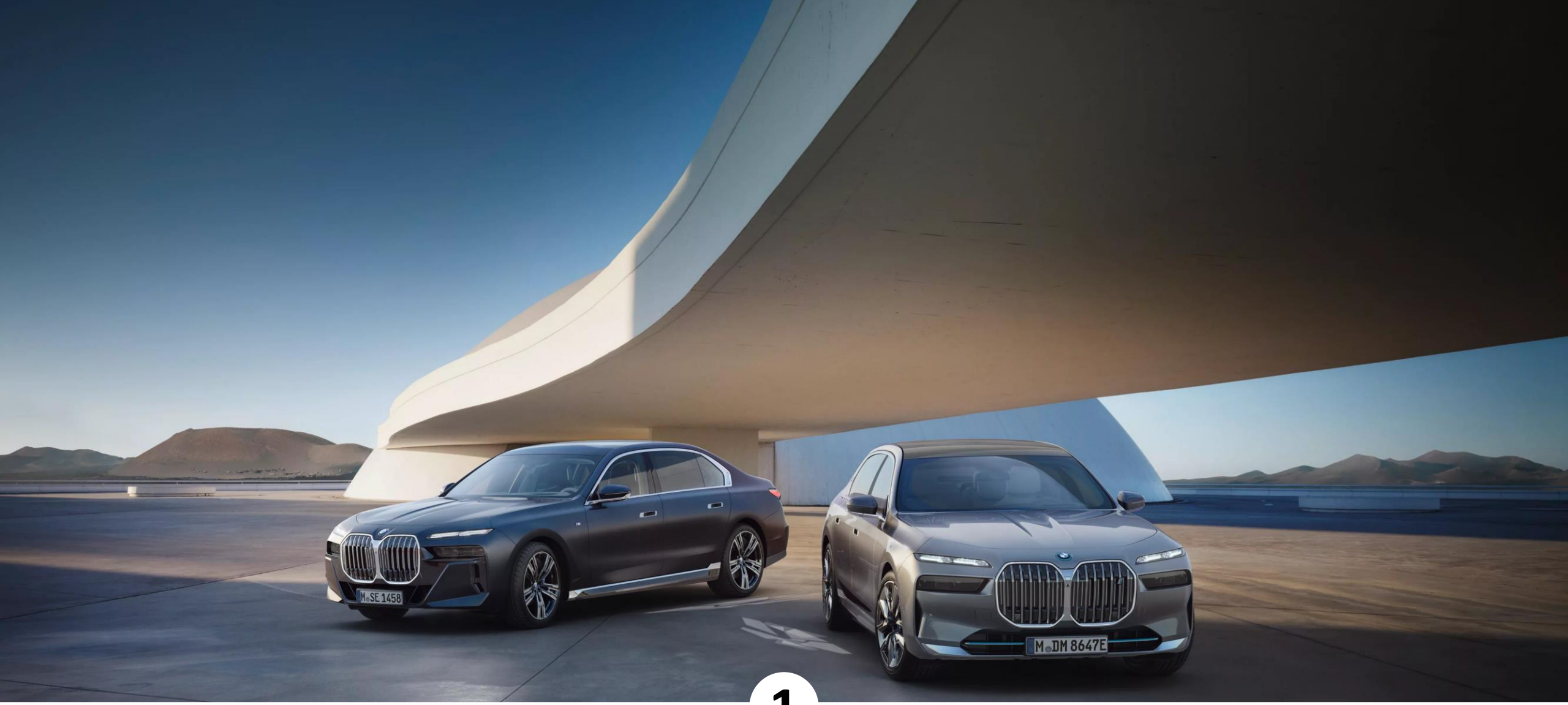
How does the distribution of car prices vary by brand and body style?

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

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

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

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



1

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

# INSIGHTS

**STEPS TO PERFORM**

- I created a pivot table with 3 columns.
- Then by using the Power Pivot, I separated all the market categories.
- After that, I created a combo chart that visualizes the relationship between market category and popularity.

**INSIGHTS**

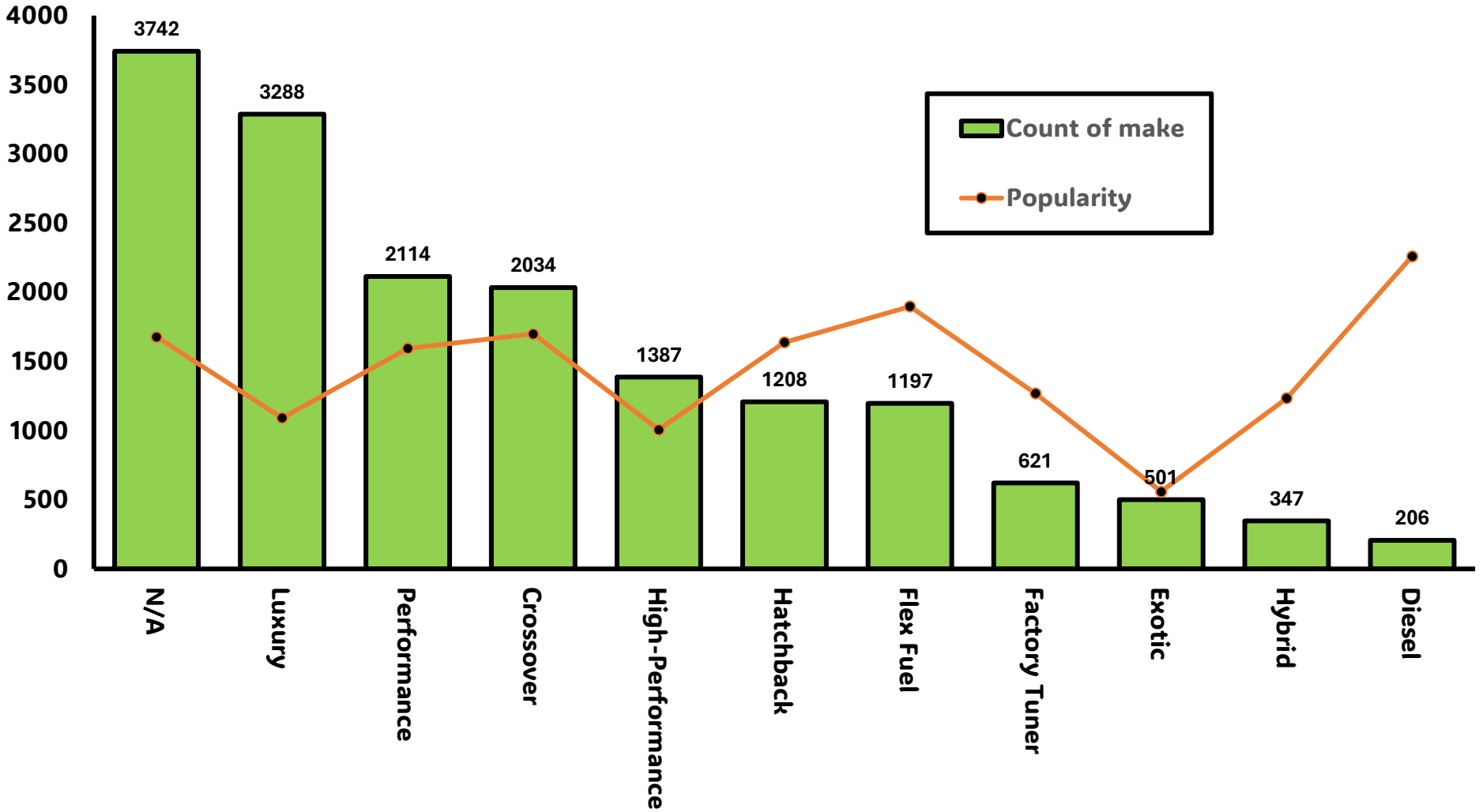
- Diesel cars have the highest popularity but have the lowest manufacture.

| Row Labels | Average of Popularity | Count of Make |
|---|---|---|
| Flex Fuel,Diesel | 5657.00 | 16 |
| Hatchback,Flex Fuel | 5657.00 | 7 |
| Crossover,Flex Fuel,Performance | 5657.00 | 6 |
| Crossover,Luxury,Performance,Hybrid | 3916.00 | 2 |
| Crossover,Factory Tuner,Luxury,Performance | 2607.40 | 5 |
| Crossover,Performance | 2585.96 | 69 |
| Crossover,Hybrid | 2563.38 | 42 |
| Luxury,Performance,Hybrid | 2333.18 | 11 |
| Diesel,Luxury | 2275.00 | 51 |
| Flex Fuel | 2217.30 | 872 |
| Hatchback,Factory Tuner,Performance | 2159.05 | 22 |
| Crossover,Luxury,Diesel | 2149.41 | 34 |
| ⋮ | | |
| Crossover,Exotic,Luxury,Performance | 238.00 | 1 |
| Exotic,Luxury,Performance | 217.03 | 36 |
| Crossover,Factory Tuner,Performance | 210.00 | 4 |
| Exotic,Luxury,High-Performance,Hybrid | 204.00 | 1 |
| Crossover,Hatchback,Luxury | 204.00 | 7 |
| Performance,Hybrid | 155.00 | 1 |
| Flex Fuel,Performance,Hybrid | 155.00 | 2 |
| Flex Fuel,Hybrid | 155.00 | 2 |
| Exotic,Luxury | 112.67 | 12 |

**72 rows & 3 columns**

# INSIGHTS

***Relationship between market category and popularity.***

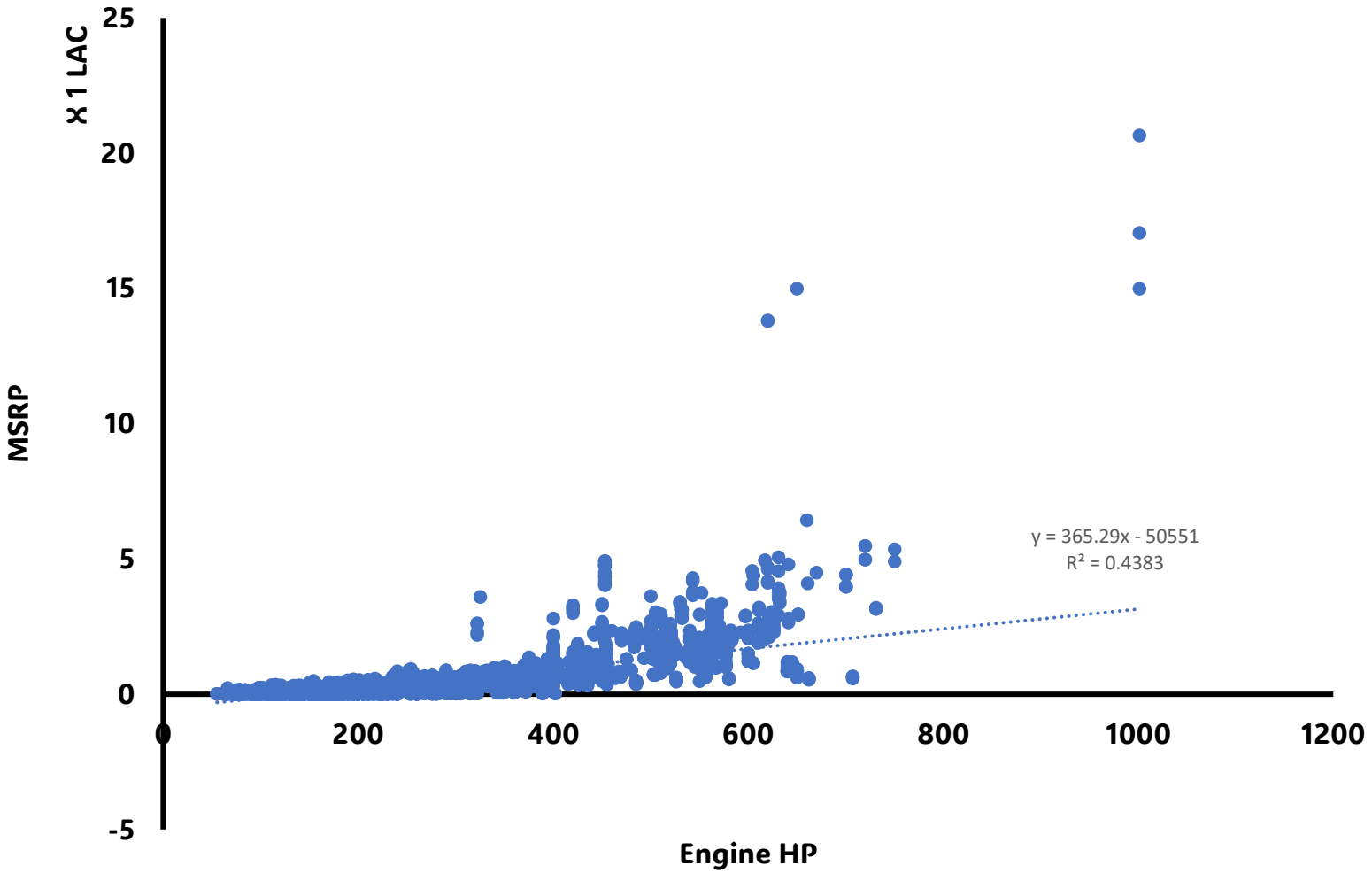



2

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

# INSIGHTS

***Relationship between car's price and power of engine***

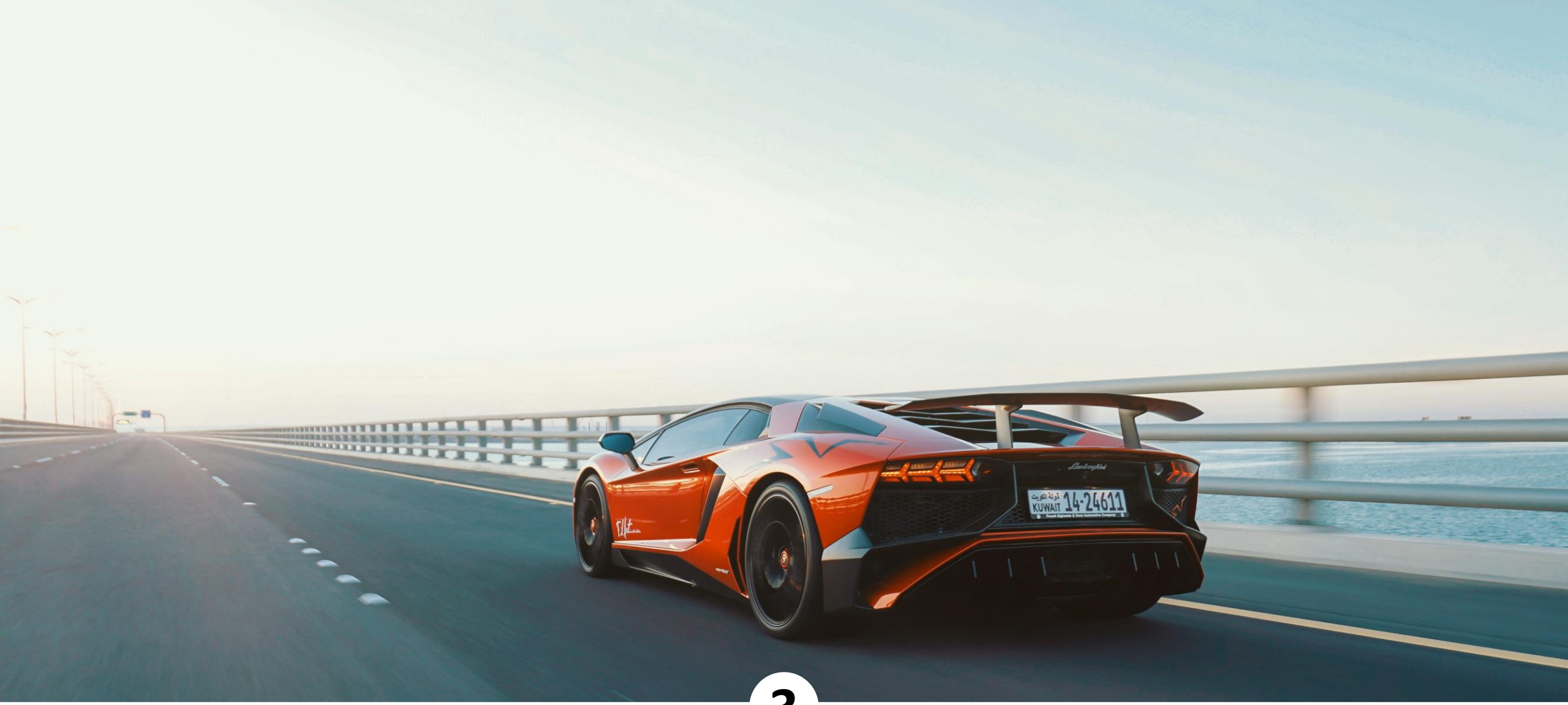



**STEPS TO PERFORM**

- I have created a scatter plot to show the relationship between the car's price and the power of the engine.

**INSIGHTS**

- When the power of the engine increases the price of the car also increases.




3

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

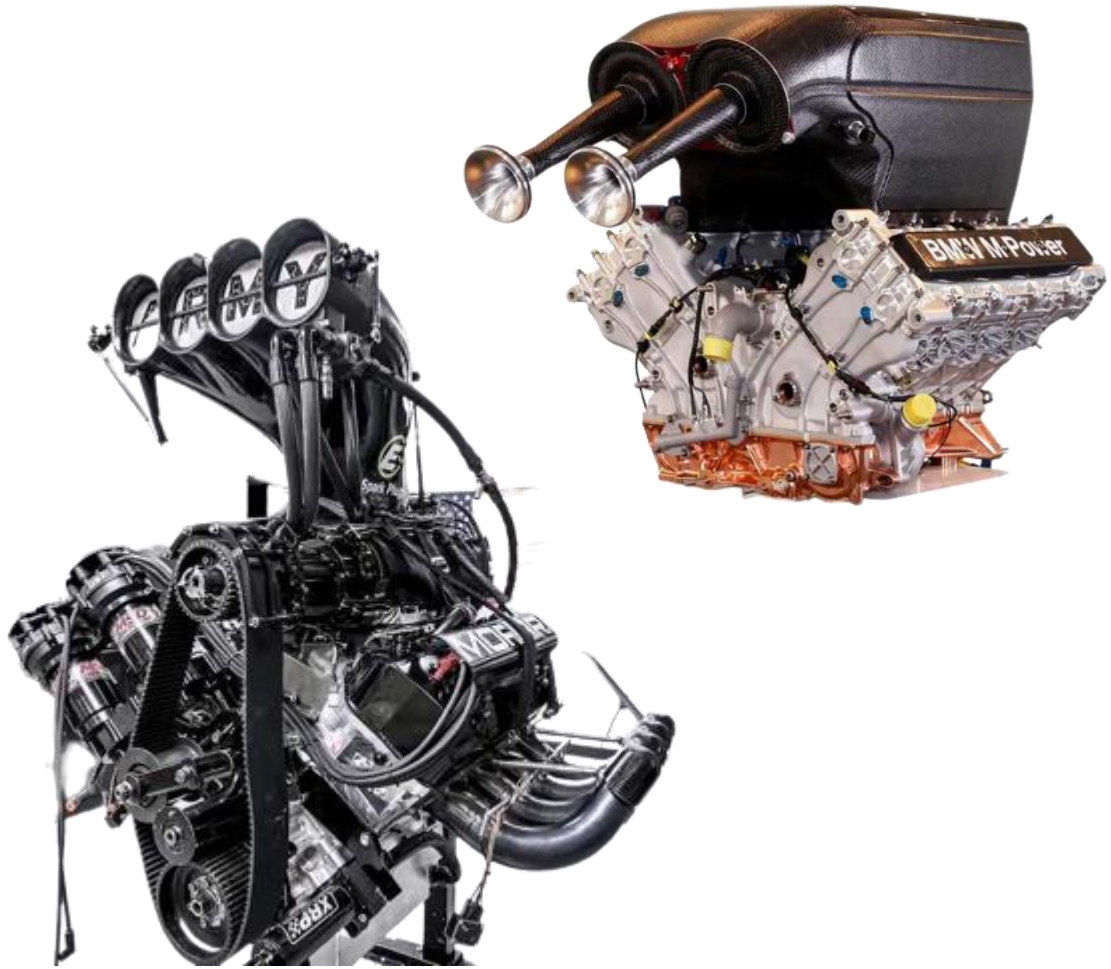
# INSIGHTS

**STEPS TO PERFORM**

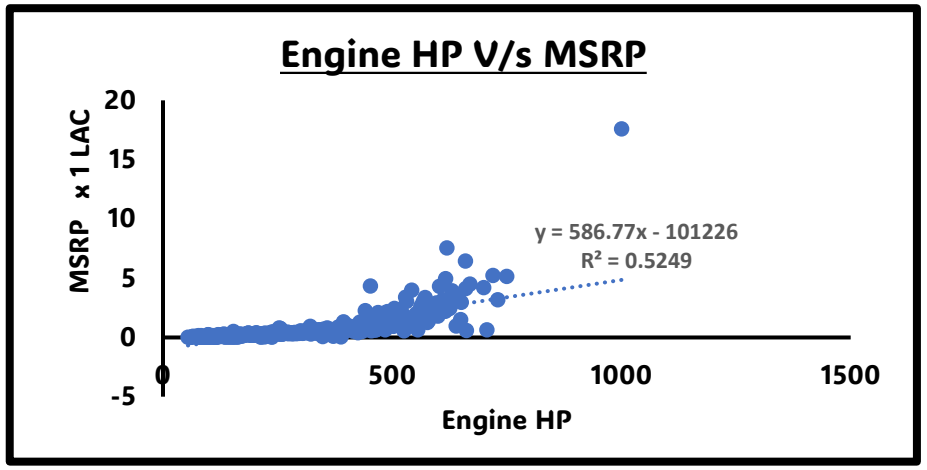
- I have created 10 pivot tables to show the relationship with each feature.
- And created 10 scatter plots to demonstrate each feature's relationship with the price.
- After that I created a bar graph to show which feature has a strong relationship with the price.

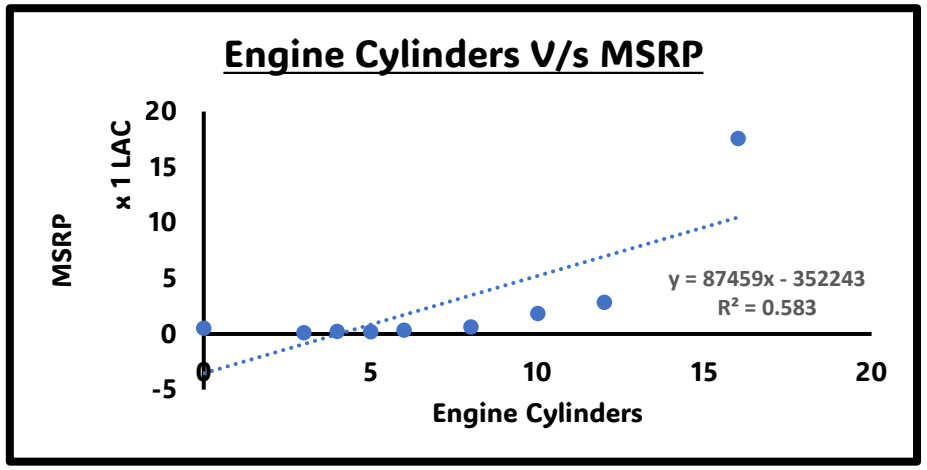
**INSIGHTS**

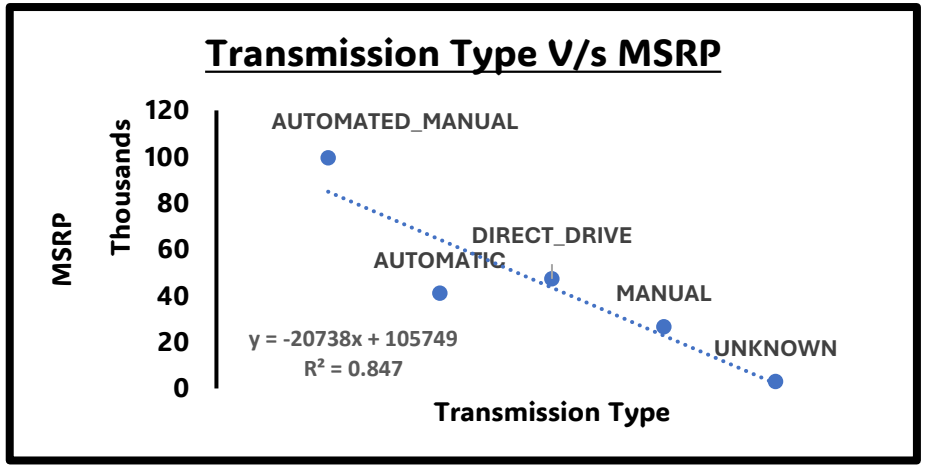
- Transmission type, number of cylinders, and power of the engine are strongly responsible for the price of the car.

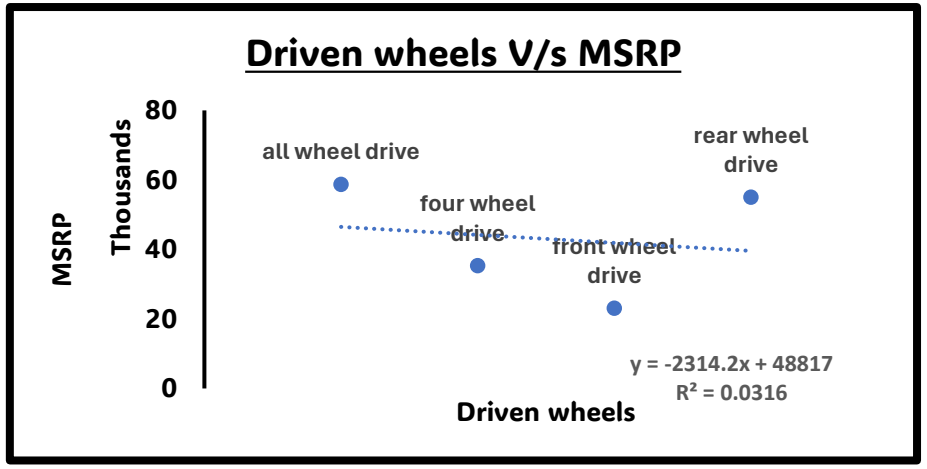


# INSIGHTS

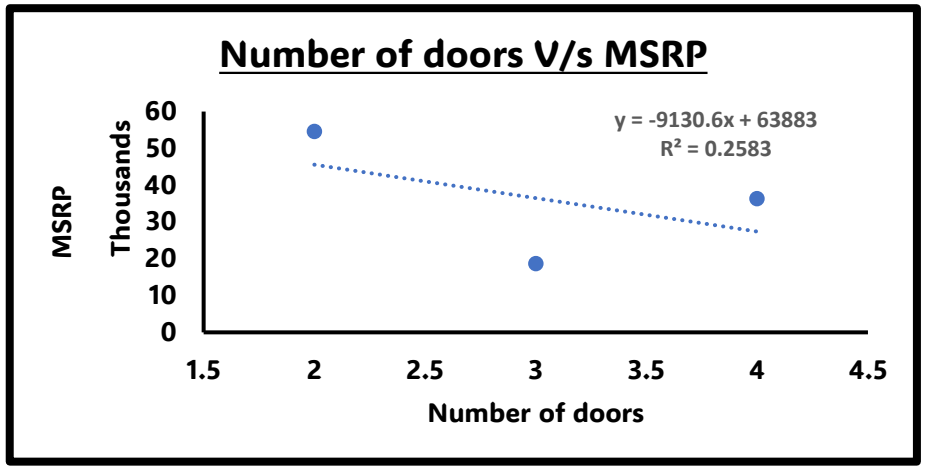

Engine HP V/s MSRP
MSRP x 1 LAC
20
15
10
5
0
-5
0
500
1000
1500
Engine HP
y = 586.77x - 101226
R² = 0.5249

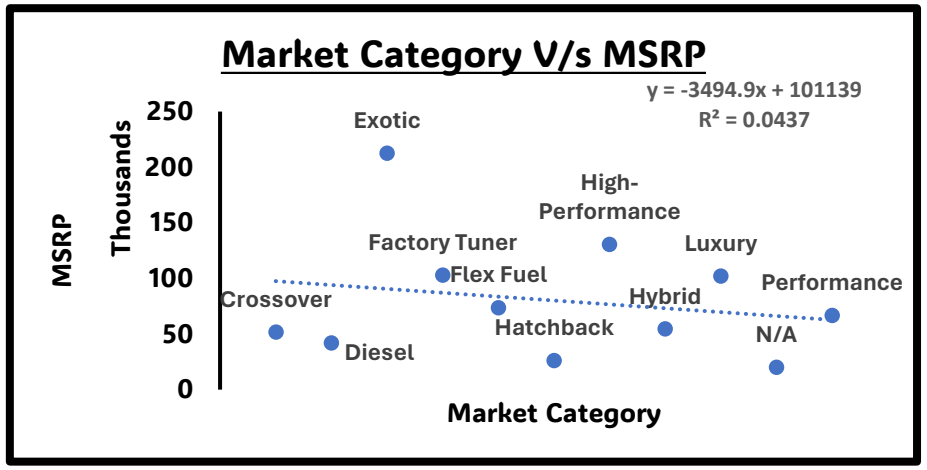

Engine Cylinders V/s MSRP
MSRP x 1 LAC
20
15
10
5
0
-5
0
5
10
15
20
Engine Cylinders
y = 87459x - 352243
R² = 0.583

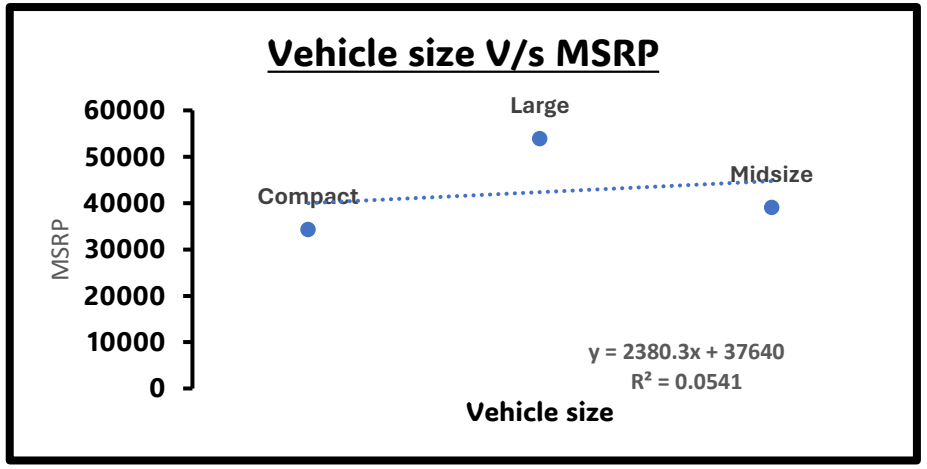

Transmission Type V/s MSRP
MSRP Thousands
120
100
80
60
40
20
0
AUTOMATED_MANUAL
DIRECT_DRIVE
AUTOMATIC
MANUAL
UNKNOWN
y = -20738x + 105749
R² = 0.847
Transmission Type

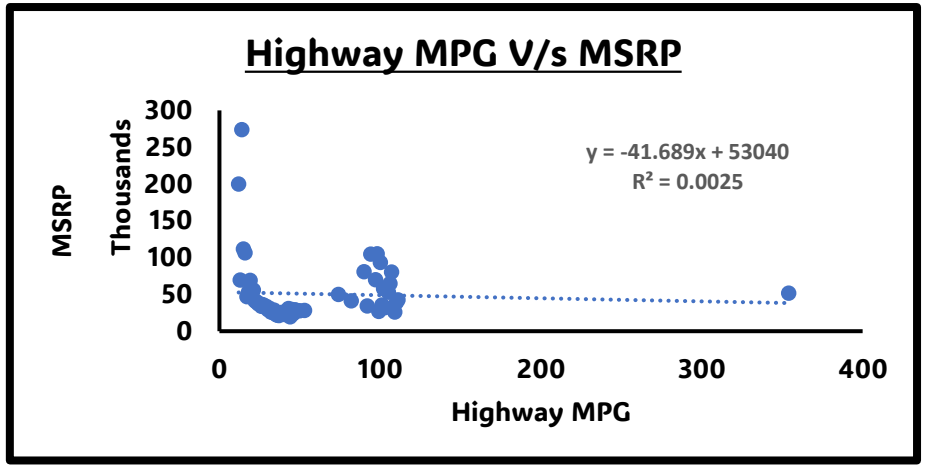

Driven wheels V/s MSRP
MSRP Thousands
80
60
40
20
0
all wheel drive
four wheel drive
front wheel drive
rear wheel drive
y = -2314.2x + 48817
R² = 0.0316
Driven wheels

# INSIGHTS

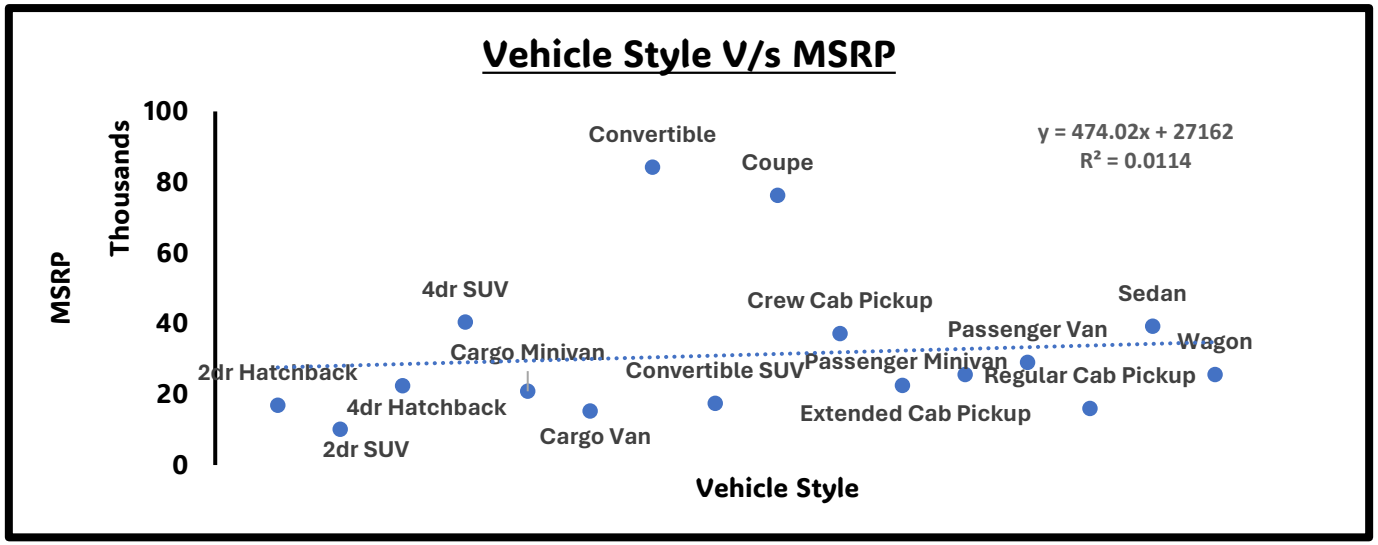

Number of doors V/s MSRP
MSRP
Thousands
60
50
40
30
20
10
0
y = -9130.6x + 63883
R² = 0.2583
1.5
2
2.5
3
3.5
4
4.5
Number of doors

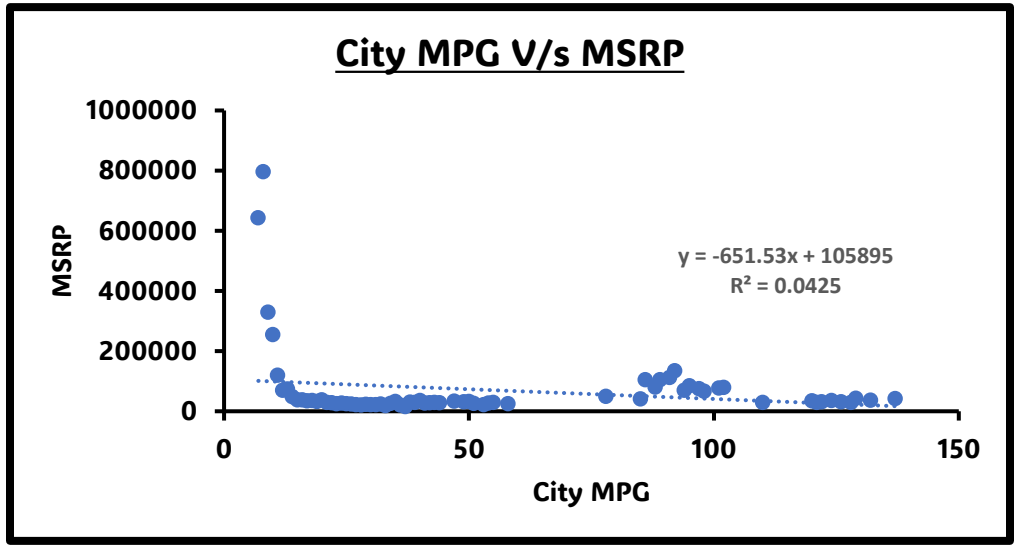

Market Category V/s MSRP
MSRP
Thousands
250
200
150
100
50
0
y = -3494.9x + 101139
R² = 0.0437
Exotic
High-
Performance
Factory Tuner
Luxury
Flex Fuel
Performance
Crossover
Hybrid
Hatchback
N/A
Diesel
Market Category


Vehicle size V/s MSRP
MSRP
60000
50000
40000
30000
20000
10000
0
Large
Midsize
Compact
y = 2380.3x + 37640
R² = 0.0541
Vehicle size


Highway MPG V/s MSRP
MSRP
Thousands
300
250
200
150
100
50
0
y = -41.689x + 53040
R² = 0.0025
0
100
200
300
400
Highway MPG

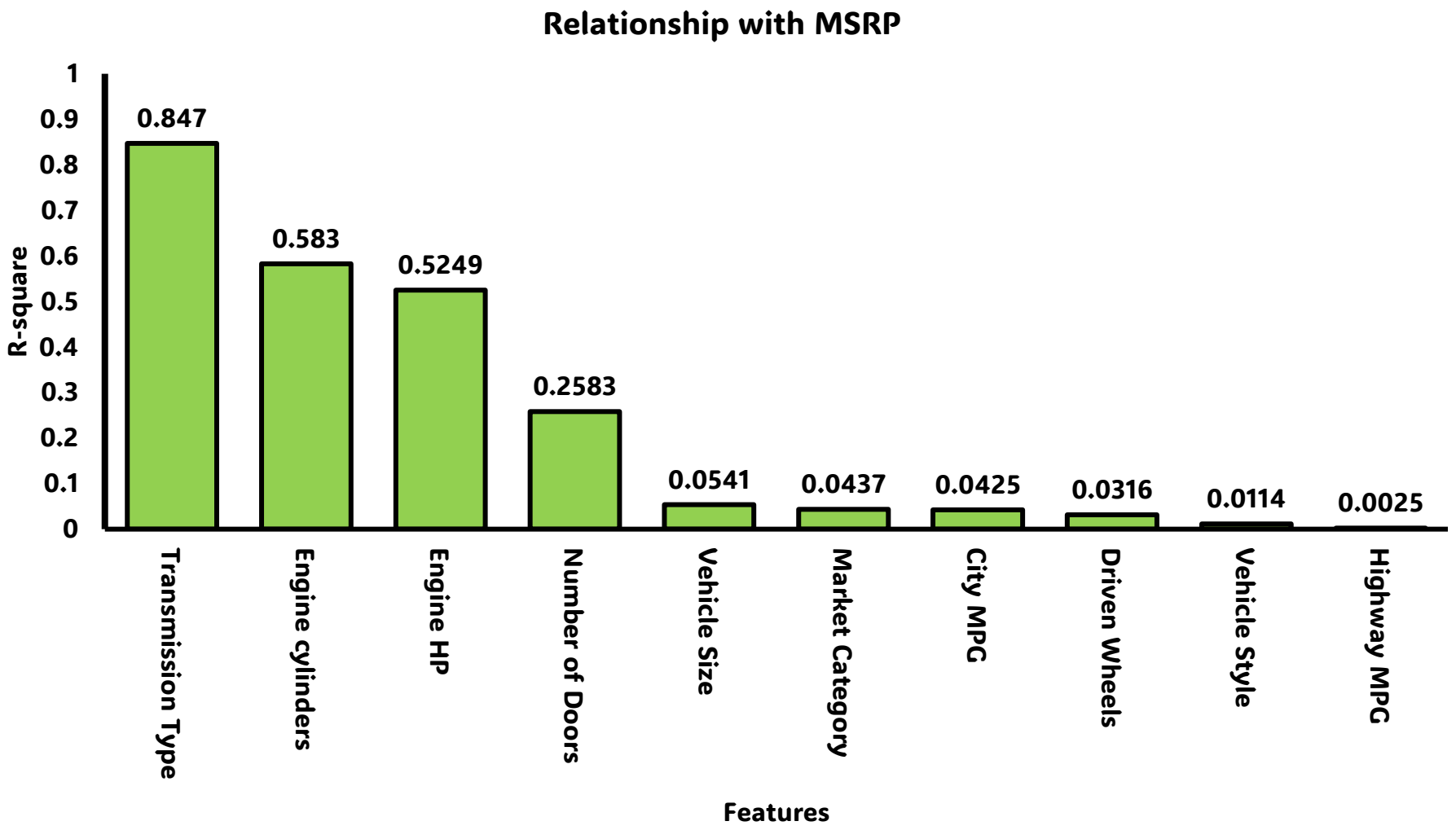
# INSIGHTS


Vehicle Style V/s MSRP
MSRP
Thousands
100
80
60
40
20
0
Convertible
Coupe
y = 474.02x + 27162
R² = 0.0114
4dr SUV
Crew Cab Pickup
Sedan
Passenger Van
Wagon
Cargo Minivan
2dr Hatchback
Convertible SUV
Passenger Minivan
Regular Cab Pickup
4dr Hatchback
Extended Cab Pickup
Cargo Van
2dr SUV
Vehicle Style


City MPG V/s MSRP
MSRP
1000000
800000
600000
400000
200000
0
y = -651.53x + 105895
R² = 0.0425
0
50
100
150
City MPG

# INSIGHTS

***Relationship of different features of car with the price of car***




4

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

# INSIGHTS

**STEPS TO PERFORM**

- I have a pivot table that shows the manufacturer's name with their respective average price of the car.
- After that I created a bar chart to visualize the pivot table.

**INSIGHTS**

- Bugatti, Maybach, Rolls-Royce, Lamborghini, and Bentley are the top manufacturers whose car average prices are the highest.

| Row Labels | Average of MSRP |
|---|---|
| Bugatti | 1757224 |
| Maybach | 546222 |
| Rolls-Royce | 351131 |
| Lamborghini | 331567 |
| Bentley | 247169 |
| McLaren | 239805 |
| Ferrari | 238219 |
| Spyker | 213323 |
| Aston Martin | 197910 |
| Maserati | 114208 |
| Porsche | 101622 |
| Tesla | 85256 |
| Mercedes-Benz | 71476 |
| Lotus | 69188 |

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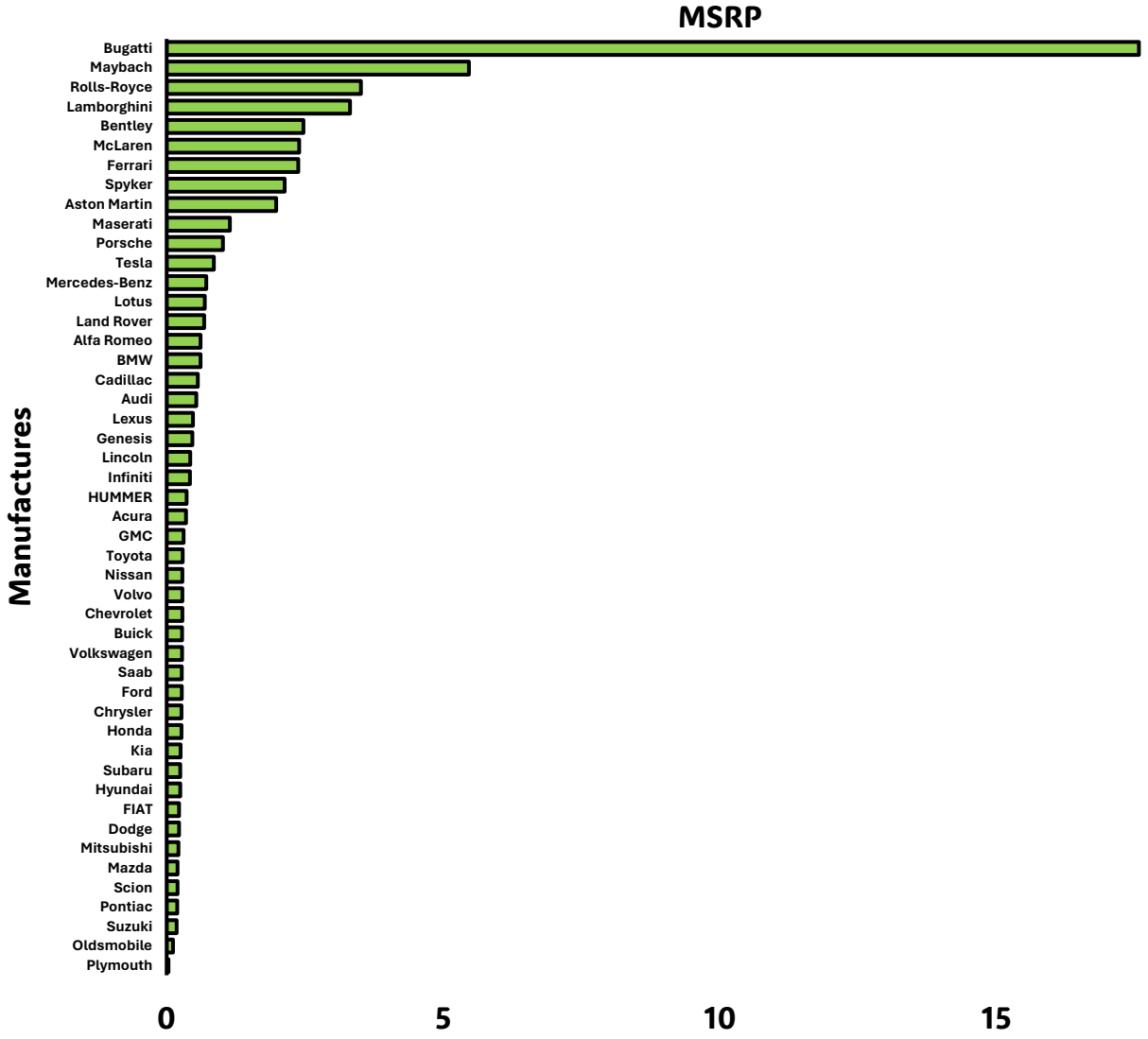
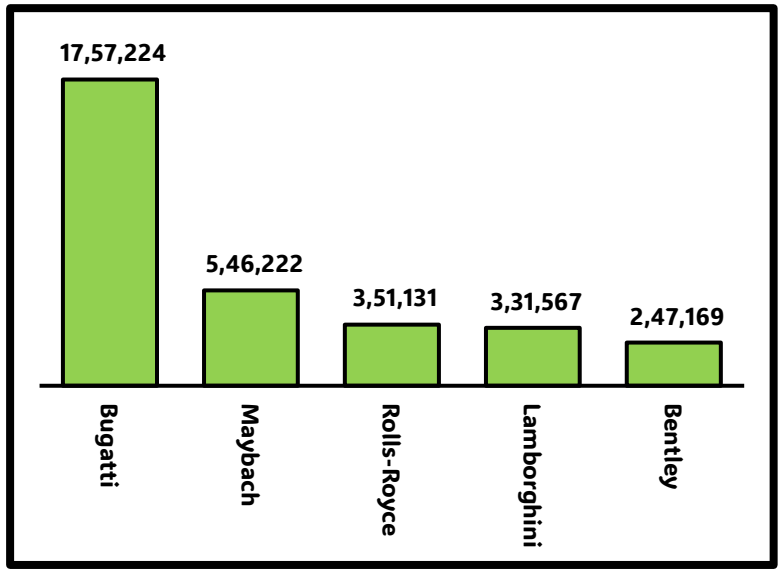
| | |
|---|---|
| Mitsubishi | 21241 |
| Mazda | 20039 |
| Scion | 19933 |
| Pontiac | 19322 |
| Suzuki | 17907 |
| Oldsmobile | 11543 |
| Plymouth | 3123 |

**48 rows**

# INSIGHTS

## *Top manufactures with highest average MSRP*



5

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

# INSIGHTS

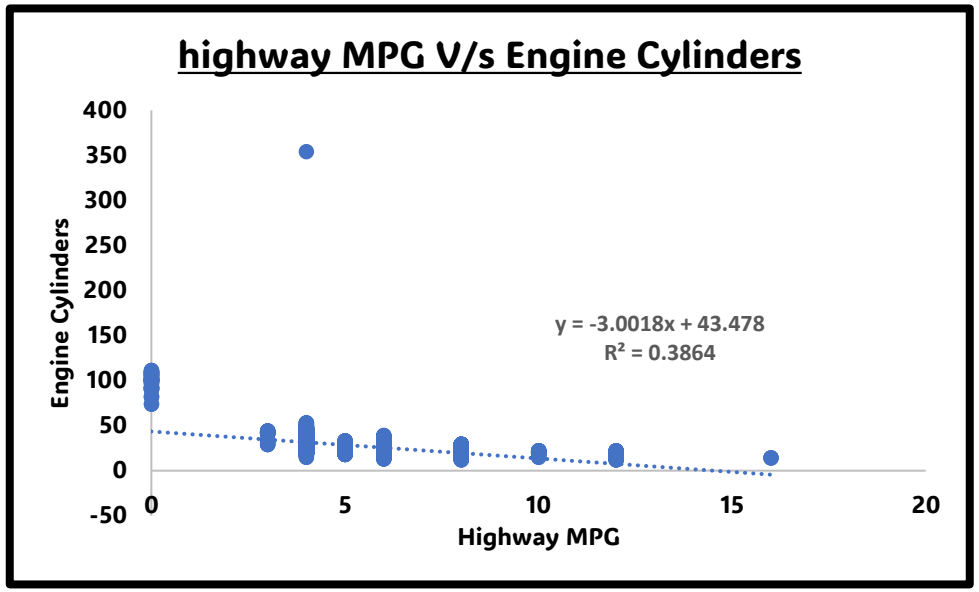
**STEPS TO PERFORM**

- I have created a scatter plot for the number of cylinders in the y-axis and highway MPG in the x-axis to determine the relation between them.

**INSIGHTS**

- There is a strong negative correlation between the number of cylinders and highway MPG which means as the number of cylinders increases highway MPG decreases.

| | |
|---|---|
| Correlation(R) | -0.62161 |
| $R^2$ | 0.386394 |



# DASHBOARD

# DASHBOARD

**The dashboard contains –**

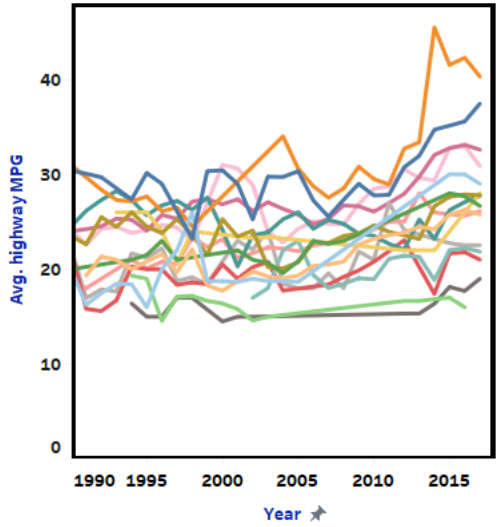
- 2-line graphs – that shows the trend of fuel efficiency on highway and city.
- 1 clustered column chart – that shows the highest and lowest average MSRP that varies with vehicle style
- 1 stacked chart – that shows the distribution of car prices that vary by brand and body style
- 2 bubble charts – that shows engine HP, MSRP, and city MPG or highway MPG varying for different models
- 1 column chart – that shows transmission type affecting average MSRP

**INSIGHTS**

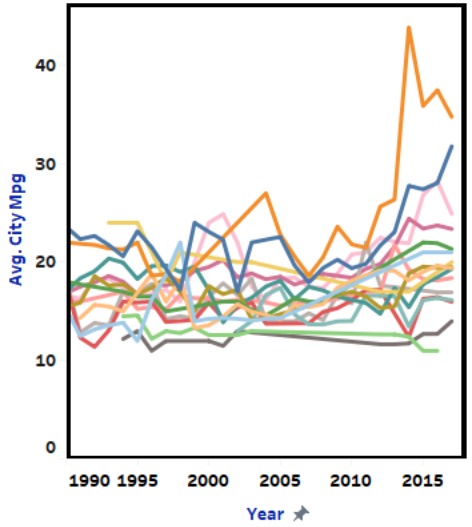
- Vehicle style 4dr Hatchback's fuel efficiency has gradually increased over time.
- Bugatti has the highest average MSRP in the vehicle style coupe.
- Automated manual cars with vehicle-style coupes and convertibles have the highest average MSRP.
- Buggati Veyron 16.4 has the highest average engine HP with the highest price and the efficiency of the car is greater in the city as compared to the highway.
- Chevrolet boasts the highest cumulative MSRP among all car brands.

# IMPACT OF CAR FEATURES

## Trend of Fuel efficiency on highway overtime




## Trend of Fuel efficiency in city overtime

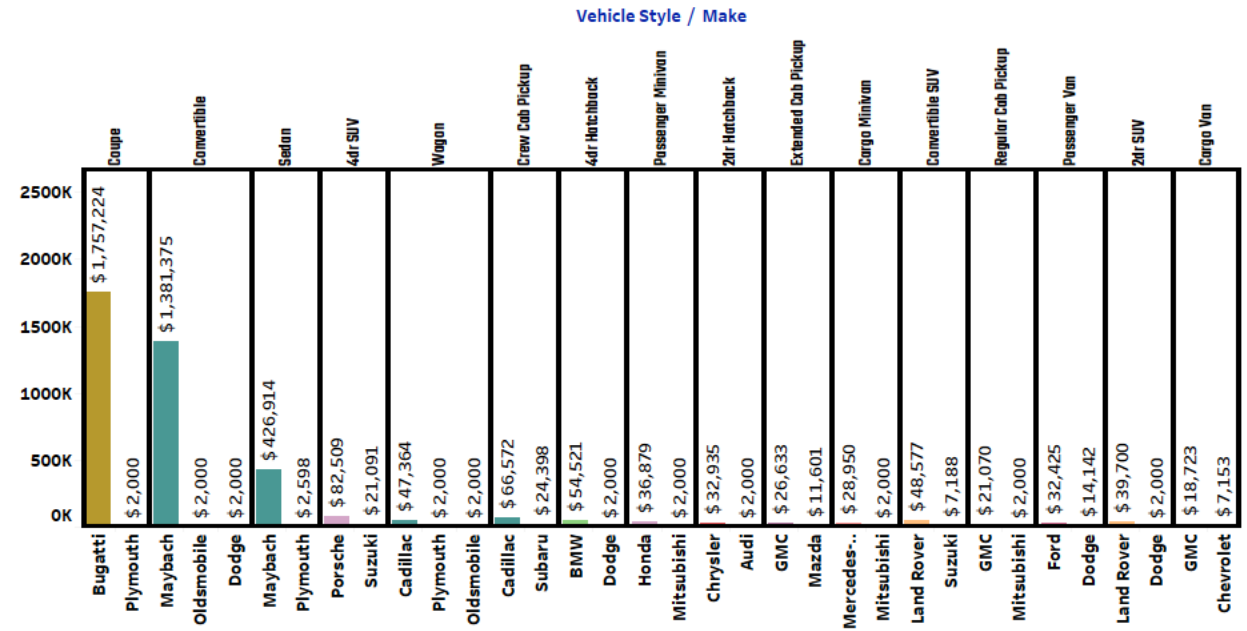



Vehicle Style
(All)

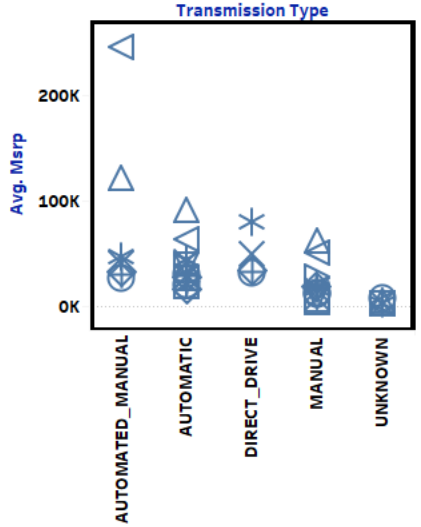
Make
(All)

Vehicle Style
- 2dr Hatchback
- 2dr SUV
- 4dr Hatchback
- 4dr SUV
- Cargo Minivan
- Cargo Van
- Convertible
- Convertible SUV
- Coupe
- Crew Cab Pickup
- Extended Cab Pickup
- Passenger Minivan
- Passenger Van
- Regular Cab Pickup
- Sedan
- Wagon

## Highest and lowest average MSRPs varying with styles

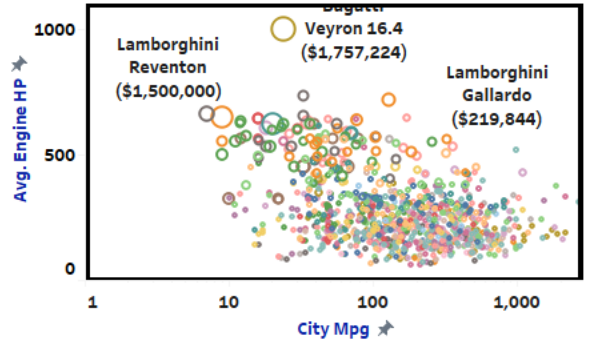



## Transmission type affecting MSRP

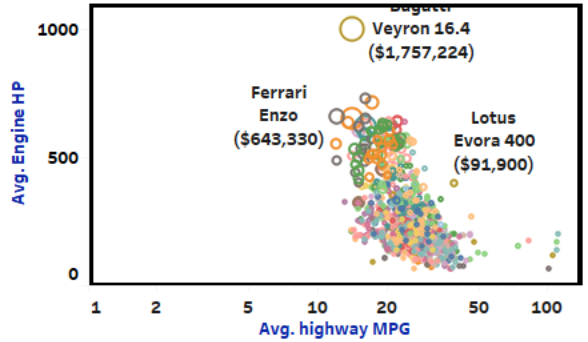



Vehicle Style
- 2dr Hatchback
- 2dr SUV
- 4dr Hatchback
- 4dr SUV
- Cargo Minivan
- Cargo Van
- Convertible
- Convertible SUV
- Coupe
- Crew Cab Pickup
- Extended Cab Pickup
- Passenger Minivan
- Passenger Van
- Regular Cab Pickup
- Sedan
- Wagon

## HP, MSRP and city MPG varying for different models



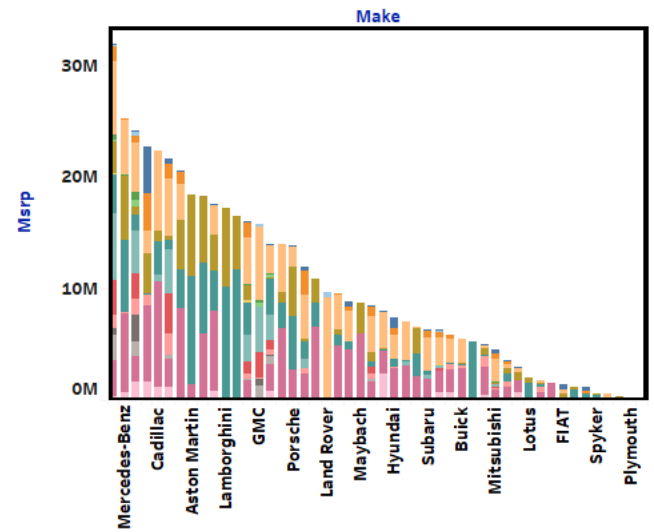

## HP, MSRP and highway MPG varying for different models




Make
- Audi
- BMW
- Bugatti
- Cadillac
- Chevrolet
- Chrysler
- Dodge
- Ford
- GMC
- Honda
- Land Rover
- Maybach
- Mazda
- Mercedes-Benz
- Mitsubishi
- Oldsmobile
- Plymouth
- Porsche
- Subaru
- Suzuki

Avg. Msrp
- 2,000
- 500,000
- 1,000,000
- 1,500,000
- 1,757,224

## Distribution of car Prices vary by brand and body style



# RESULT

In order to maximize profitability while meeting consumer demand, a car manufacturer should focus on optimizing pricing and product development decisions based on several key insights:

1. **Fuel Efficiency Trends**: Recognize the gradual increase in fuel efficiency for 4-door hatchbacks over time and consider incorporating these improvements into product development to align with consumer preferences for more fuel-efficient vehicles.
2. **High-End Coupe Strategy**: Acknowledge Bugatti's high average MSRP in the coupe vehicle style and explore opportunities to introduce premium coupe models to cater to luxury car enthusiasts.
3. **Automated Manual Focus**: Capitalize on the strong market demand for automated manual cars in coupe and convertible styles by offering innovative features and designs to justify higher average MSRPs.
4. **Performance and Efficiency**: Emulate the success of the Bugatti Veyron 16.4 by combining high engine horsepower with efficient city driving capabilities, potentially introducing more models with similar attributes.
5. **Brand Value**: Leverage Chevrolet's position as the brand with the highest cumulative MSRP to enhance brand value and potentially justify premium pricing for certain models.

# RESULT

6. **Cylinder Efficiency**: Consider the strong negative correlation between the number of cylinders and highway MPG when designing engines, aiming for more efficient configurations.
7. **Luxury Manufacturer Insights**: Analyze top manufacturers like Bugatti, Maybach, Rolls-Royce, Lamborghini, and Bentley to identify pricing strategies and luxury features that resonate with consumers.
8. **Factors Affecting Price**: Understand that transmission type, number of cylinders, and engine power significantly impact car prices; optimize these factors in product development to align with target pricing.
9. **Engine Power**: Recognize the direct relationship between engine power and car price, potentially offering a range of power options to cater to various consumer segments.
10. **Diesel Market Opportunity**: Explore the potential of diesel cars, given their popularity among consumers despite lower manufacturing numbers, and consider offering innovative diesel models to tap into this market.

By incorporating these insights into pricing and product development decisions, a car manufacturer can position itself to meet consumer demands, drive profitability, and maintain a competitive edge in the dynamic automotive market

# THANK YOU

**Tableau Link: click here**

**Excel Link: click here**