Project: Analyzing the Impact of Car Features on Price and Profitability

Trainity Project 7

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Hyperlink for Excel File:

https://drive.google.com/drive/folders/16u7_J1R-XF9glCxCSvSvGH0OTyIls7Se?usp=sharing

Project Description:

This project aims on the relation of impact of car features and price. For this project various tasks have been assigned along with making dashboards on Microsoft Excel.

The dataset given for this project is car brand data which has information about the car model and the specifications (number of doors, power, miles per gallon information, etc.).

The tasks have been divided into 2 parts.

1. Analysis
2. Building the dashboard

TASKS: ANALYSIS

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

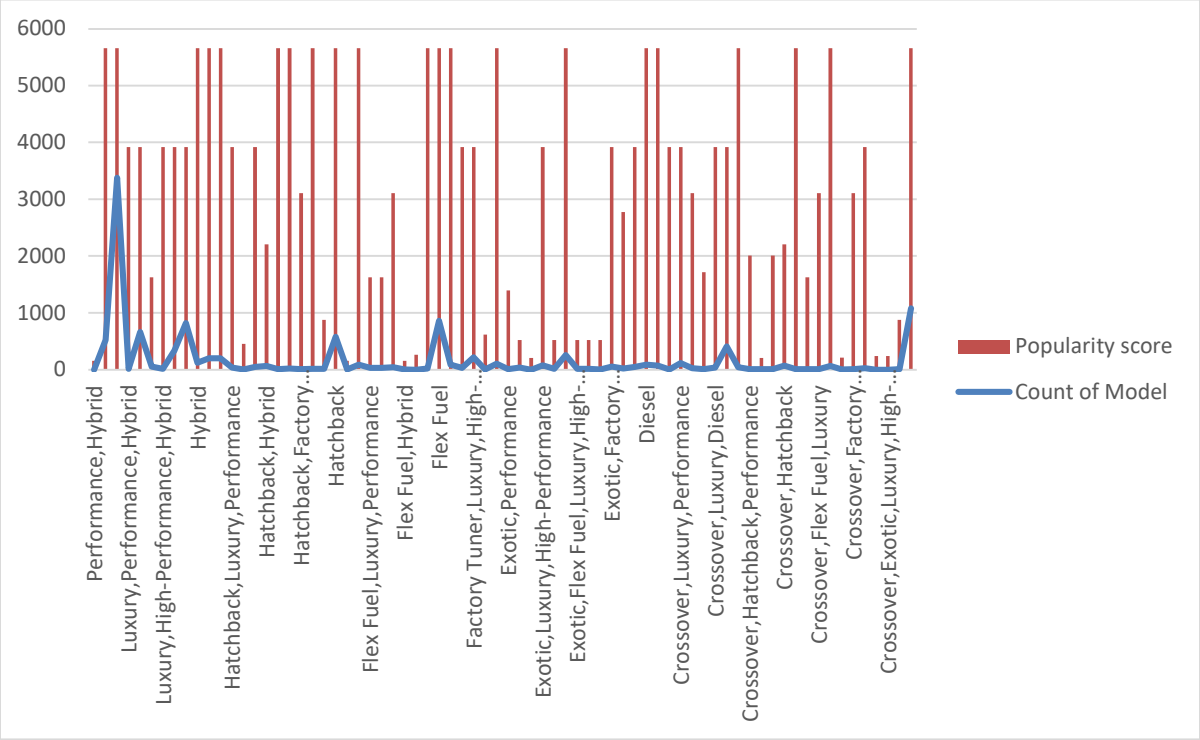
  For this task first I selected Market Category, Model, Popularity score, then I created a pivot table for the same where I cound the count of model and the popularity score for each market category.

market category	Count of Model	Popularity score
Performance,Hybrid	1	155
Performance	520	5657
N/A	3376	5657
Luxury,Performance,Hybrid	11	3916
Luxury,Performance	659	3916
Luxury,Hybrid	52	1624
Luxury,High-Performance,Hybrid	12	3916
Luxury,High-Performance	334	3916
Luxury	819	3916
Hybrid	121	5657
High-Performance	198	5657

Hatchback,Performance	198	5657
Hatchback,Luxury,Performance	36	3916
Hatchback,Luxury,Hybrid	3	454
Hatchback,Luxury	45	3916
Hatchback,Hybrid	64	2202
Hatchback,Flex Fuel	7	5657
Hatchback,Factory Tuner,Performance	21	5657
Hatchback,Factory Tuner,Luxury,Performance	9	3105
Hatchback,Factory Tuner,High-Performance	13	5657
Hatchback,Diesel	14	873
Hatchback	574	5657
Flex Fuel,Performance,Hybrid	2	155
Flex Fuel,Performance	87	5657
Flex Fuel,Luxury,Performance	28	1624
Flex Fuel,Luxury,High-Performance	32	1624
Flex Fuel,Luxury	39	3105
Flex Fuel,Hybrid	2	155
Flex Fuel,Factory Tuner,Luxury,High-Performance	1	258
Flex Fuel,Diesel	16	5657
Flex Fuel	855	5657
Factory Tuner,Performance	84	5657
Factory Tuner,Luxury,Performance	31	3916
Factory Tuner,Luxury,High-Performance	215	3916
Factory Tuner,Luxury	2	617
Factory Tuner,High-Performance	104	5657
Exotic,Performance	10	1391
Exotic,Luxury,Performance	36	520
Exotic,Luxury,High-Performance,Hybrid	1	204
Exotic,Luxury,High-Performance	77	3916
Exotic,Luxury	12	520
Exotic,High-Performance	254	5657
Exotic,Flex Fuel,Luxury,High-Performance	11	520
Exotic,Flex Fuel,Factory Tuner,Luxury,High-Performance	13	520
Exotic,Factory Tuner,Luxury,Performance	3	520
Exotic,Factory Tuner,Luxury,High-Performance	51	3916
Exotic,Factory Tuner,High-Performance	21	2774
Diesel,Luxury	47	3916
Diesel	84	5657
Crossover,Performance	69	5657
Crossover,Luxury,Performance,Hybrid	2	3916
Crossover,Luxury,Performance	112	3916
Crossover,Luxury,Hybrid	24	3105
Crossover,Luxury,High-Performance	9	1715

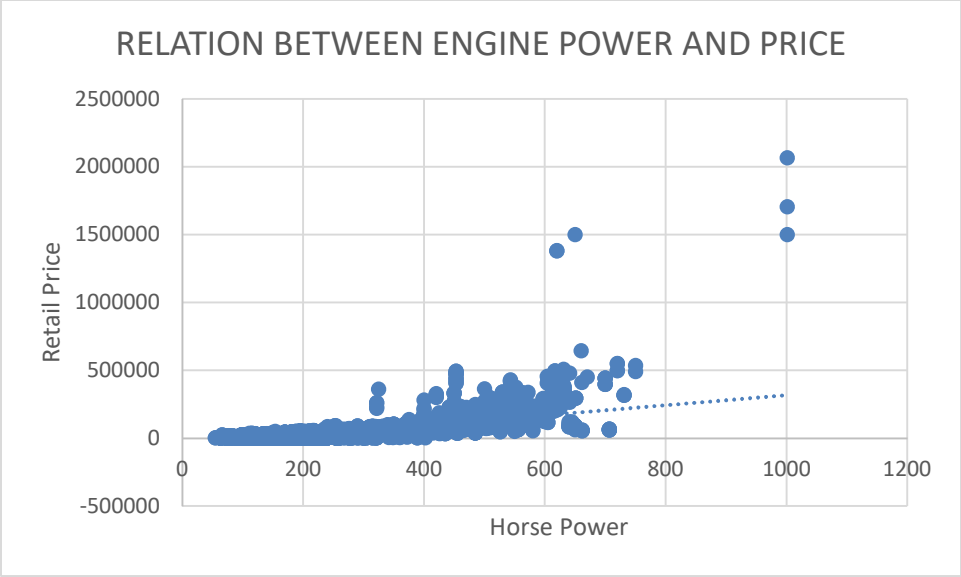
Crossover,Luxury,Diesel	34	3916
Crossover,Luxury	406	3916
Crossover,Hybrid	42	5657
Crossover,Hatchback,Performance	6	2009
Crossover,Hatchback,Luxury	7	204
Crossover,Hatchback,Factory Tuner,Performance	6	2009
Crossover,Hatchback	72	2202
Crossover,Flex Fuel,Performance	6	5657
Crossover,Flex Fuel,Luxury,Performance	6	1624
Crossover,Flex Fuel,Luxury	10	3105
Crossover,Flex Fuel	64	5657
Crossover,Factory Tuner,Performance	4	210
Crossover,Factory Tuner,Luxury,Performance	5	3105
Crossover,Factory Tuner,Luxury,High-Performance	26	3916
Crossover,Exotic,Luxury,Performance	1	238
Crossover,Exotic,Luxury,High-Performance	1	238
Crossover,Diesel	7	873
Crossover	1075	5657
Grand Total	**11199**	**5657**

- **Task 1.B:** Create a combo chart that visualizes the relationship between market category and popularity.



Insight Required: 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.

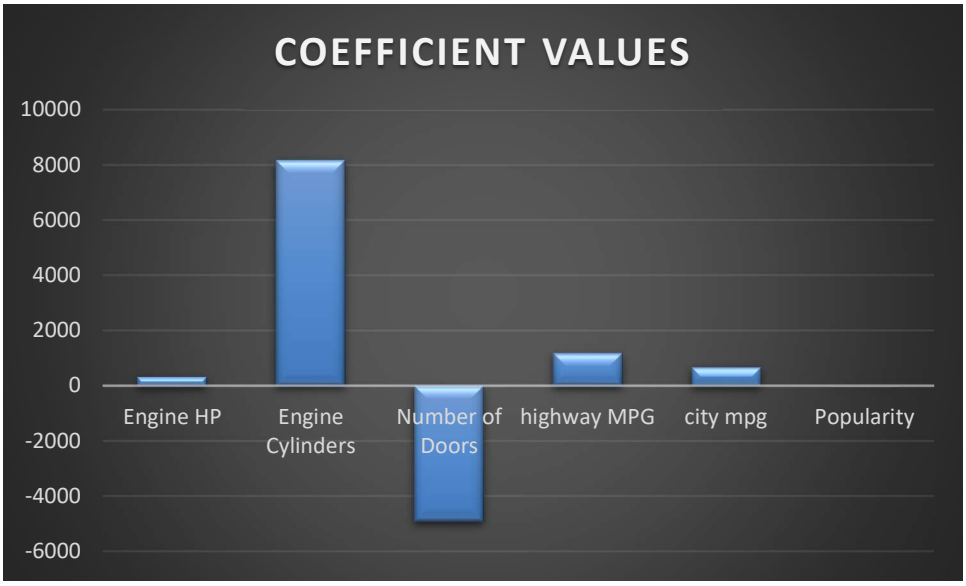


The correlation coefficient between both the variables is: 0.659174

Insight: with increasing Horse power the Price also increases.

Insight Required: 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.



The visualization clearly states that engine cylinders is important to determine the car's price.
The visualization was done by using regression modeling in excel.

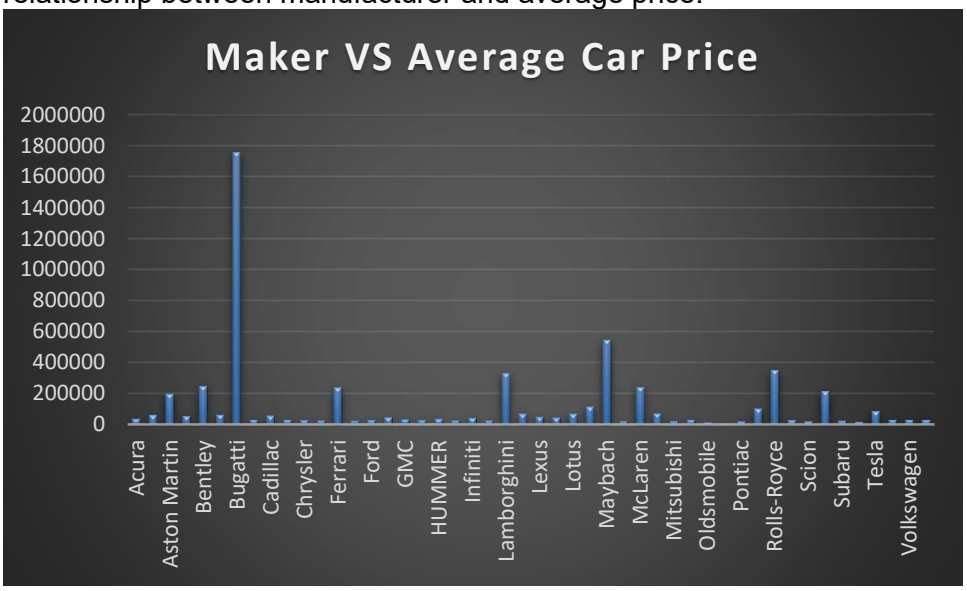
Insight Required: How does the average price of a car vary across different manufacturers?

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

Row Labels	Average of MSRP
Acura	35087.4878
Alfa Romeo	61600
Aston Martin	198123.4615
Audi	54574.1215
Bentley	247169.3243
BMW	62162.55864
Bugatti	1757223.667
Buick	29034.18947
Cadillac	56368.26515
Chevrolet	29074.72576
Chrysler	26722.96257
Dodge	24857.04537
Ferrari	238218.8406
FIAT	22670.24194
Ford	28511.30788
Genesis	46616.66667
GMC	32444.08506
Honda	26655.14781
HUMMER	36464.41176
Hyundai	24926.26255
Infiniti	42640.27134
Kia	25513.75546
Lamborghini	331567.3077
Land Rover	68067.08633
Lexus	47549.06931
Lincoln	43860.825
Lotus	68377.14286
Maserati	113684.4909
Maybach	546221.875
Mazda	20416.62379
McLaren	239805
Mercedes-Benz	72069.52786
Mitsubishi	21340.5625
Nissan	28921.15245

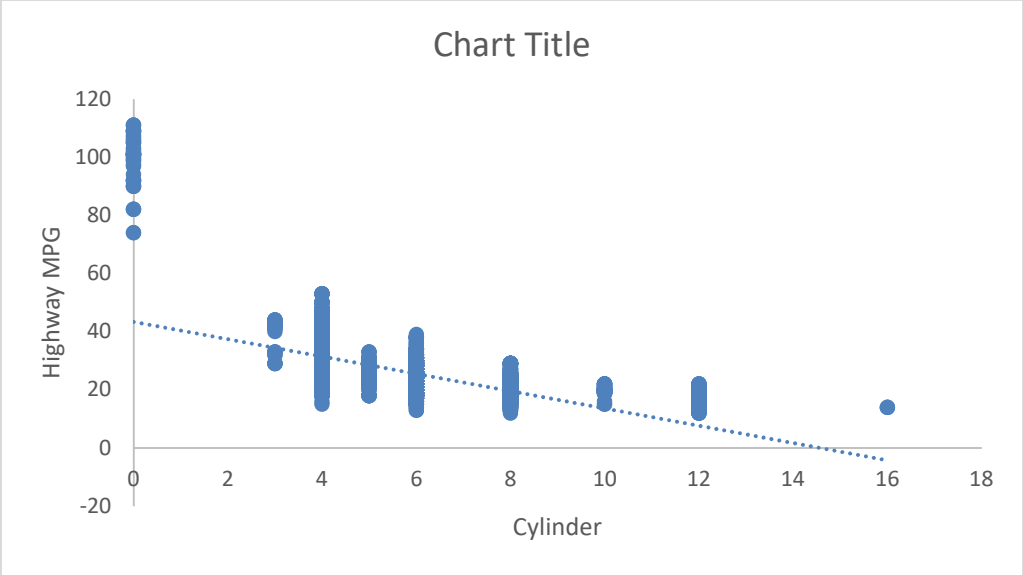
Oldsmobile	12843.79545
Plymouth	3296.873239
Pontiac	19800.0442
Porsche	101622.3971
Rolls-Royce	351130.6452
Saab	27879.80734
Scion	19932.5
Spyker	214990
Subaru	24240.67364
Suzuki	18026.4152
Tesla	85255.55556
Toyota	28846.5605
Volkswagen	28978.52289
Volvo	29724.68421
Grand Total	**41925.92714**

- **Task 4.B:** Create a bar chart or a horizontal stacked bar chart that visualizes the relationship between manufacturer and average price.



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

Task 5: 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.



CORRELATION : -0.65746

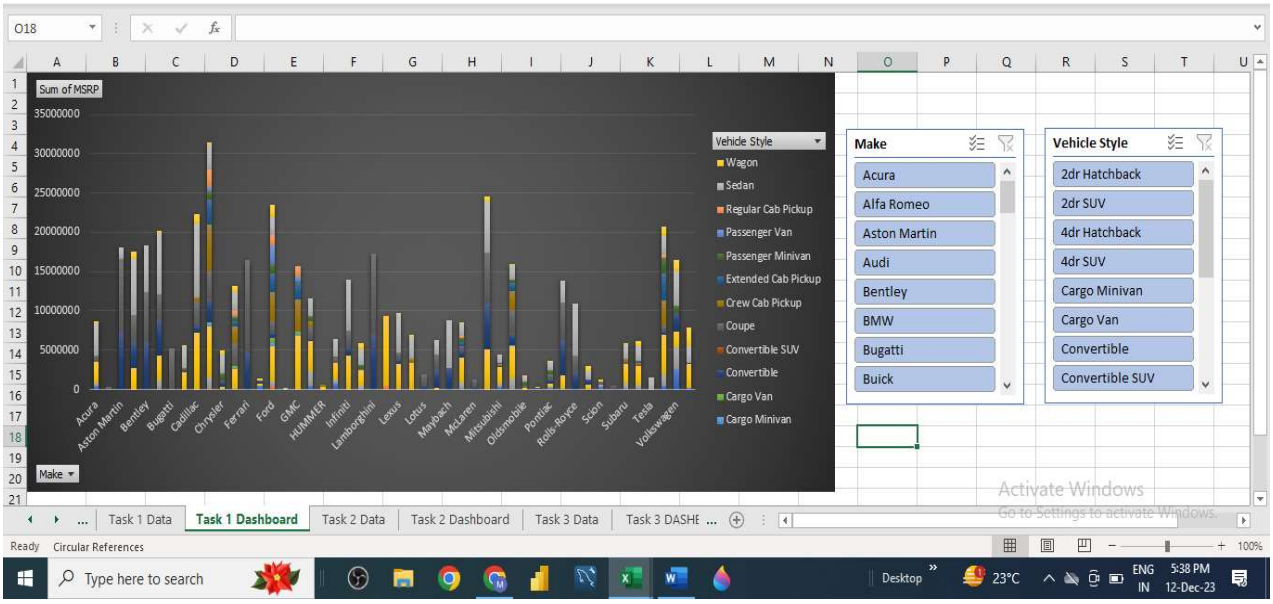
With increasing number of cylinder the Highway MPG decreases.

Building the Dashboard:

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

Steps:

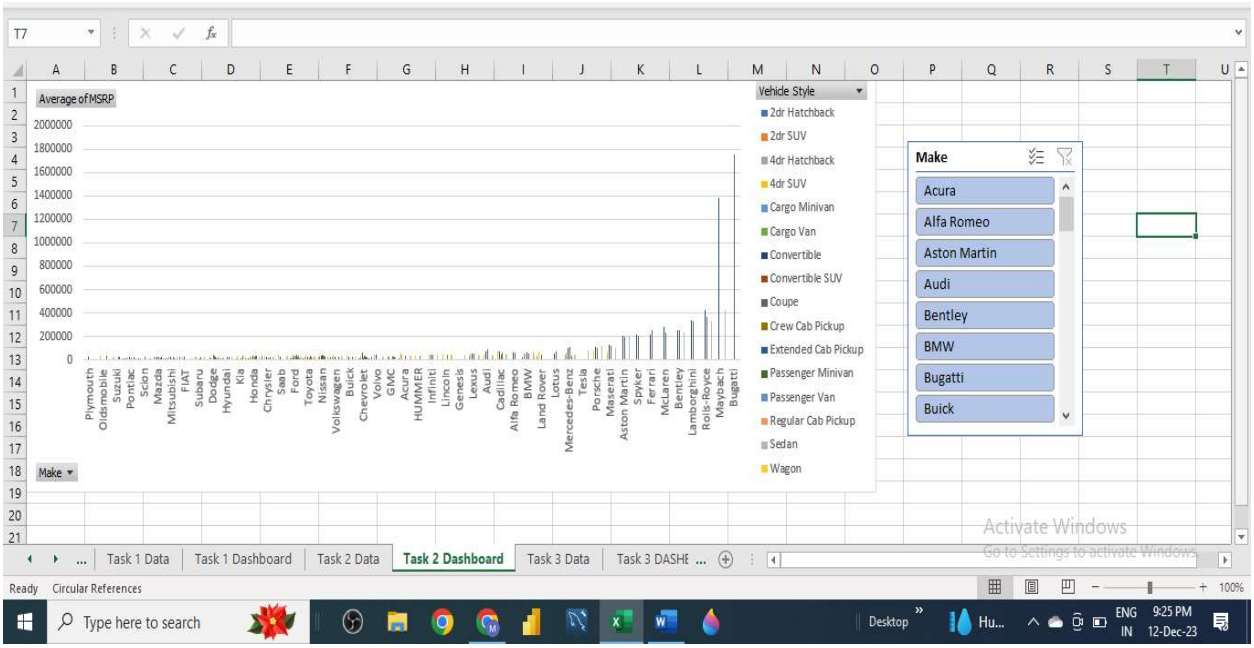
1. First, I created a pivot table for Brand, Body style and MSRP.
2. After that I calculated the average of MSRP for every Brand and sorted out by every Body style of the brand.
3. After that I plotted stacked column chart for visualization.



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

Steps:

1. First I created a pivot table for Make, Vehicle style and MSRP.
2. Then I added Make into column, Vehicle style into Rows and found out the average of MSRP for each maker according to its vehicle style.
3. Lastly I created a Clustered column chart to compare the average MSRPs across different car brands and body styles.



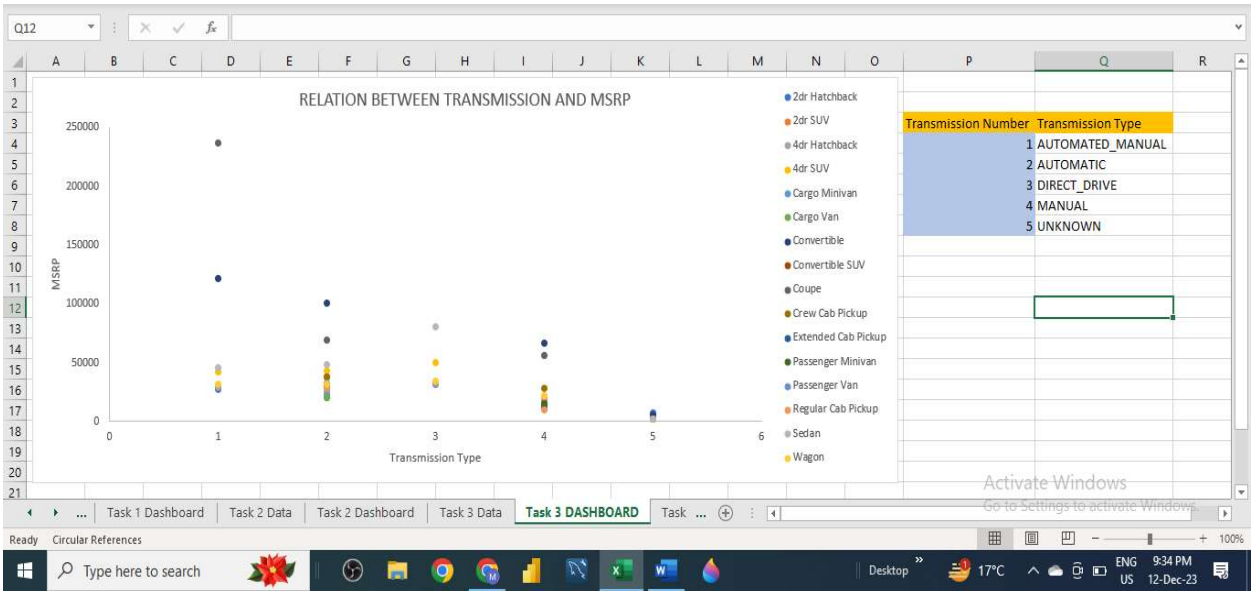
Insight:

car brands that have the highest and lowest average MSRPs is Bugatti (1757223.667) and Plymouth (3296.87) Respectively.

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

Steps:

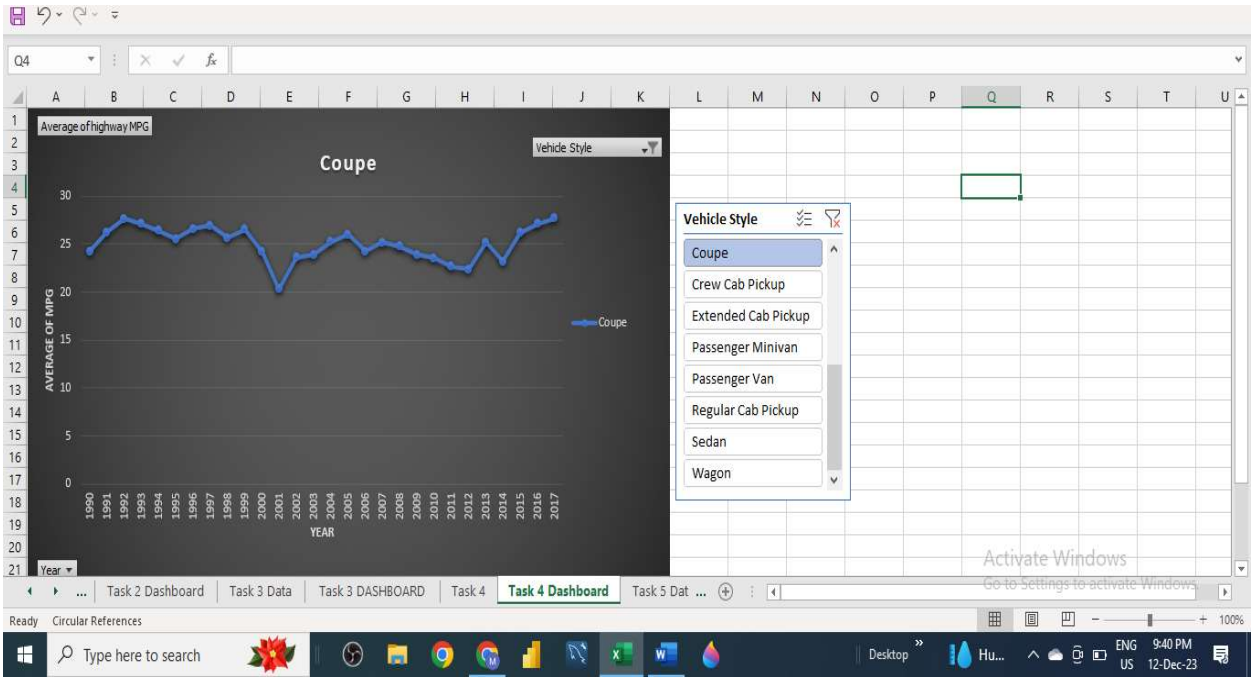
1. First I created a pivot table using Transmission type, Vehicle style and MSRP.
2. Stating the transmission type into column and vehicle style into rows and found out the average of MSRP accordingly.
3. At last, I created a Scatter plot chart to visualize the relationship between MSRP and transmission type, with different symbols for each body style.



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

Steps:

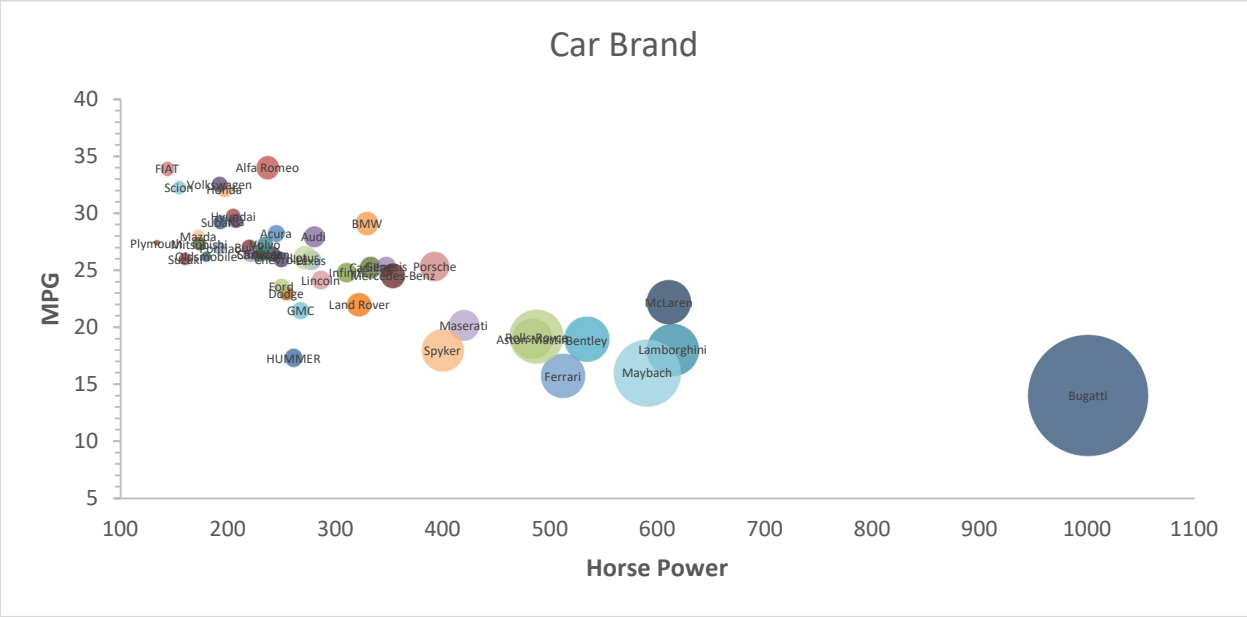
1. First I created a pivot table using Year, Vehicle style and Highway MPG.
2. Stating the Year into column and vehicle style into rows and found out the average of Highway MPG.
3. At last, I created a Line chart to show the trend of fuel efficiency (MPG) over time for each body style. Also, kept a slicer for convenience.



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

Steps:

1. First I created a pivot table using Make, Engine HP, Highway MPG, MSRP.
2. Stating the Make into column and found the average of Engine HP, Highway MPG, MSRP.
3. At last, I created a buble chart to show the trend of fuel efficiency (MPG) over time for each body style. X axis- Average of engine HP, Y axis- Average of Highway MPG, Bubble length- Average of MSRP.



Insight: Bugatti is the highest in MSRP with the maximum horse power and the lowest MPG.

Tech Stack Used: Microsoft Excel 2021 was used for this project.