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**ANALYZING THE IMPACT OF  
CAR FEATURES ON PRICE  
AND PROFITABILITY**  
.....



**ABHAY SAXENA**

# 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. 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.

# DATA DESCRIPTION

The dataset contains information on various car models and their specifications, and is titled "Car Features and MSRP". It was collected and made available on Kaggle by Cooper Union, a private college located in New York City.

Here is a brief overview of the dataset:

- **Number of observations:** 11,159
- **Number of variables:** 16
- **File type:** CSV (Comma Separated Values)

The variables in the dataset are:

- **Make:** the make or brand of the car
- **Model:** the specific model of the car
- **Year:** the year the car was released
- **Engine Fuel Type:** the type of fuel used by the car (gasoline, diesel, etc.)
- **Engine HP:** the horsepower of the car's engine
- **Engine Cylinders:** the number of cylinders in the car's engine
- **Transmission Type:** the type of transmission (automatic or manual)
- **Driven Wheels:** the type of wheels driven by the car (front, rear, all)
- **Number of Doors:** the number of doors the car has
- **Market Category:** the market category the car belongs to (Luxury, Performance, etc.)
- **Vehicle Size:** the size of the car
- **Vehicle Style:** the style of the car (Sedan, Coupe, etc.)
- **Highway MPG:** the estimated miles per gallon the car gets on the highway
- **City MPG:** the estimated miles per gallon the car gets in the city
- **Popularity:** a ranking of the popularity of the car (based on the number of times it has been viewed on Edmunds.com)
- **MSRP:** the manufacturer's suggested retail price of the car

# DATA CLEANING

- To calculate the number of blank cells in the data I used the formula =COUNTBLANK(B7:B11874)
- Then I counted the null percentage by dividing the blanks calculated in first step with total counts.

% of Null					
Null	0	0	0	0	0
total	11868	11868	11868	11868	11868
					227
Make	Model	Year	Engine Fuel Type	Engine HP	
BMW	1 Series M	2011	premium unleaded (r	335	
BMW	1 Series	2011	premium unleaded (r	300	
BMW	1 Series	2011	premium unleaded (r	300	
BMW	1 Series	2011	premium unleaded (r	230	
BMW	1 Series	2011	premium unleaded (r	230	
BMW	1 Series	2012	premium unleaded (r	230	
BMW	1 Series	2012	premium unleaded (r	300	
BMW	1 Series	2012	premium unleaded (r	300	
BMW	1 Series	2012	premium unleaded (r	230	
BMW	1 Series	2013	premium unleaded (r	230	
BMW	1 Series	2013	premium unleaded (r	300	
BMW	1 Series	2013	premium unleaded (r	230	
BMW	1 Series	2013	premium unleaded (r	300	
BMW	1 Series	2013	premium unleaded (r	230	

- After running the formula I got Engine Fuel Type, Engine HP, Engine Cylinders and Number of Doors column has some null values.
- So I used median for Engine HP , Engine Cylinders and Number of Doors to get approximate idea of values and filled the blanks accordingly.
- After that Engine Fuel Type contains Categorical Values which I cannot judge on the basis of most Engine Fuel Type so came up with the solution of deleting those rows.
- After that on further checking the data found out that model column has dates present which is not natural because car model cannot be dates.
- Again Model column was consisting of Both variables and numbers but since it represents model I cannot judge the null values on the basis of most type of model in the dataset.
- Hence came up with the solution with deleting all the rows with dates as model.
- After that I was left with 11868 rows.



## TECH-STACK USED

For this project I used Microsoft Excel to run my queries. Microsoft Excel is a spreadsheet developed by Microsoft for Windows, macOS, Android and iOS.

It features calculation or computation capabilities, graphing tools, pivot tables, and a macro programming language called Visual Basic for Applications (VBA). Excel forms part of the Microsoft Office suite of software.

I used the Excel sheet provided and ran multiple functions to get the desired answers.

This project helped me in understanding the Excel Table at a much detailed manner and helped to improve my strength in extracting data from tables and visualize it in the forms of different graphs.



## FOR EXCEL FILES:

FOR ANALYSIS TASK EXCEL FILE



ANALYSIS TASK

FOR DASHBOARD TASK EXCEL FILE



DASHBOARD FILE

# Analysis Task

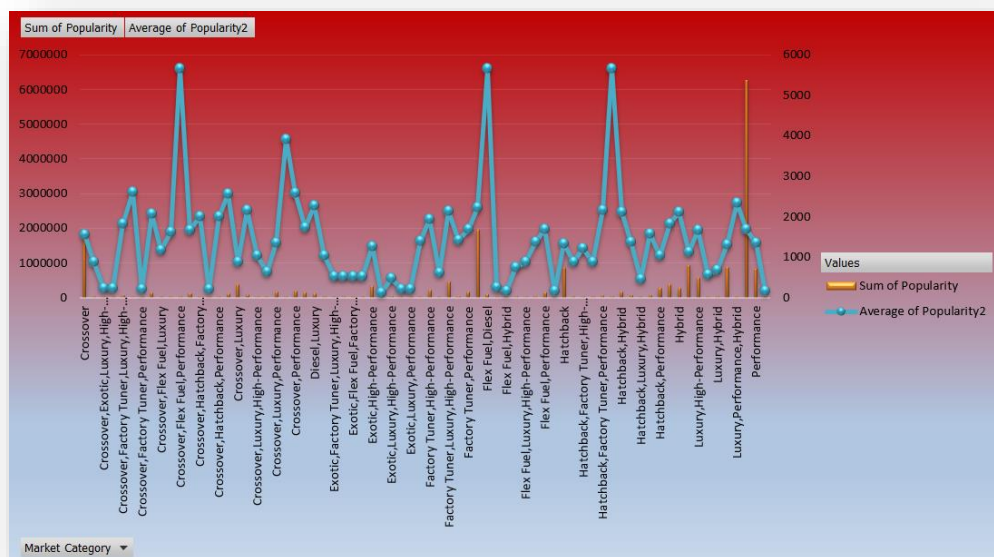
**Insight Required:** How does the popularity of a car model vary across different market categories?

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

Market Category	Values	
	Count of Market Category	Sum of Popularity
Crossover	1110	1715242
Crossover,Diesel	7	6111
Crossover,Exotic,Luxury,High-Performance	1	238
Crossover,Exotic,Luxury,Performance	1	238
Crossover,Factory Tuner,Luxury,High-Performance	26	47410
Crossover,Factory Tuner,Luxury,Performance	5	13037
Crossover,Factory Tuner,Performance	4	840
Crossover,Flex Fuel	64	132720
Crossover,Flex Fuel,Luxury	10	11732
Crossover,Flex Fuel,Luxury,Performance	6	9744
Crossover,Flex Fuel,Performance	6	33942
Crossover,Hatchback	72	120650
Crossover,Hatchback,Factory Tuner,Performance	6	12054
Crossover,Hatchback,Luxury	7	1428
Crossover,Hatchback,Performance	6	12054
Crossover,Hybrid	42	107662
Crossover,Luxury	410	362665
Crossover,Luxury,Diesel	34	73080
Crossover,Luxury,High-Performance	9	9335
Crossover,Luxury,Hybrid	24	15142
Crossover,Luxury,Performance	113	151968
Crossover,Luxury,Performance,Hybrid	2	7832
Crossover,Performance	69	178431
Diesel	84	145396
Diesel,Luxury	51	116025
Exotic,Factory Tuner,High-Performance	21	21974
Exotic,Factory Tuner,Luxury,High-Performance	52	26912
Exotic,Factory Tuner,Luxury,Performance	3	1560
Exotic,Flex Fuel,Factory Tuner,Luxury,High-Performance	13	6760
Exotic,Flex Fuel,Luxury,High-Performance	11	5720
Exotic,High-Performance	261	331818
Exotic,Luxury	12	1352
Exotic,Luxury,High-Performance	79	36899
Exotic,Luxury,High-Performance,Hybrid	1	204
Exotic,Luxury,Performance	36	7813

Exotic,Performance	10	13910
Factory Tuner,High-Performance	106	205790
Factory Tuner,Luxury	2	1234
Factory Tuner,Luxury,High-Performance	215	458674
Factory Tuner,Luxury,Performance	31	43816
Factory Tuner,Performance	92	156004
Flex Fuel	872	1933488
Flex Fuel,Diesel	16	90512
Flex Fuel,Factory Tuner,Luxury,High-Performance	1	258
Flex Fuel,Hybrid	2	310
Flex Fuel,Luxury	39	29115
Flex Fuel,Luxury,High-Performance	33	29004
Flex Fuel,Luxury,Performance	28	38642
Flex Fuel,Performance	87	146201
Flex Fuel,Performance,Hybrid	2	310
Hatchback	641	845393
Hatchback,Diesel	14	12222
Hatchback,Factory Tuner,High-Performance	13	15667
Hatchback,Factory Tuner,Luxury,Performance	9	7982
Hatchback,Factory Tuner,Performance	22	47499
Hatchback,Flex Fuel	7	39599
Hatchback,Hybrid	72	152730
Hatchback,Luxury	46	63457
Hatchback,Luxury,Hybrid	3	1362
Hatchback,Luxury,Performance	38	59513
Hatchback,Performance	252	261991
High-Performance	199	362468
Hybrid	123	258985
Luxury	824	931116
Luxury,High-Performance	334	557118
Luxury,High-Performance,Hybrid	12	6826
Luxury,Hybrid	52	35029
Luxury,Performance	661	865418
Luxury,Performance,Hybrid	11	25665
N/A	3739	6273477
Performance	601	810673
Performance,Hybrid	1	155
<b>Grand Total</b>	<b>11868</b>	<b>18507601</b>

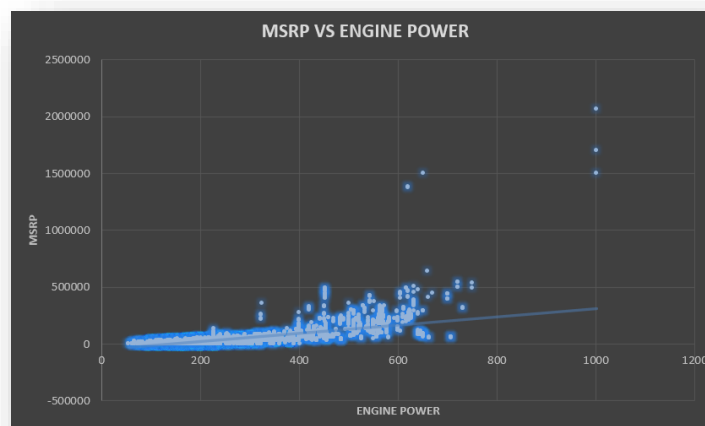
**Task 1.B:** Create a combo chart that visualizes the relationship between market category and popularity.



We can see that for most of the cars the market category is not applicable. The maximum count of cars belong to “crossover”. And the maximum average of popularity is of “hatchback flex fuel”. The maximum sum of popularity is of “flexfuel”.

**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.

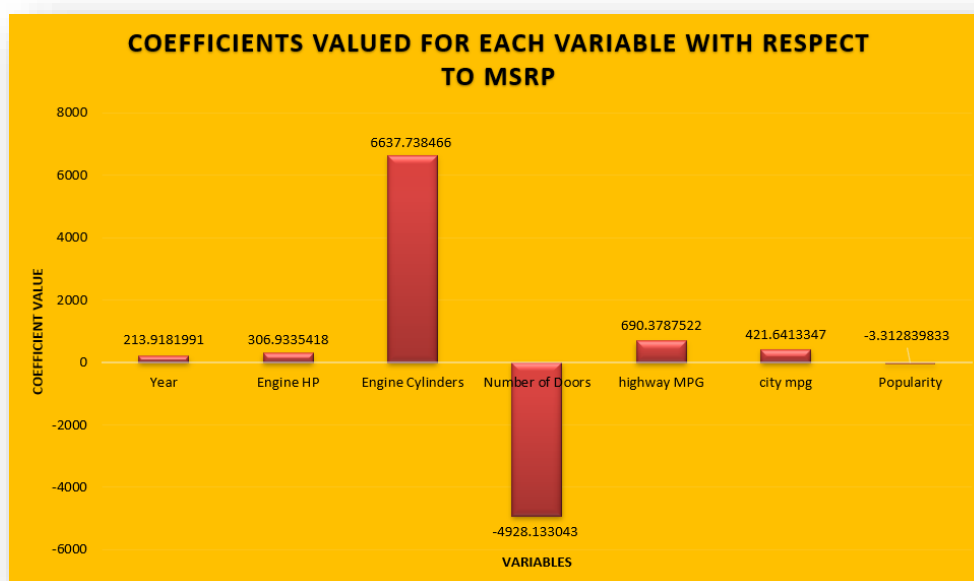


We can see that there is an upward trend in the engine power and price as it is obvious that if the engine power increases the prices are going to increase. A direct correlation exists between engine power and car prices. As engine power increases, manufacturers invest in advanced technologies and performance enhancements, leading to higher production costs. Consequently, consumers should anticipate a proportional increase in the prices of cars with greater engine power. However, cars like “Bugatti” have very high engine power so their pricing is also exorbitantly high which can clearly be seen in the graph. Also “Lamborghini” and “Maybach” also have very high price though the engine power is not highest.

**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.

	<i>Coefficients</i>
Intercept	-508001.3034
Year	213.9182
Engine HP	306.9335
Engine Cylinders	6637.7385
Number of Doors	-4928.1330
highway MPG	690.3788
city mpg	421.6413
Popularity	-3.3128





I first copied the numerical data columns such as year, engine power, etc. to a separate sheet and then I used regression function in the excel to find the relationships of MSRP with respect to all other variables. "Engine Cylinder" has the strongest direct relationship with car's price since car price increase based on no of engine cylinders. The "number of doors" though does not much affect the pricing but still its relationship with price is negative.

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

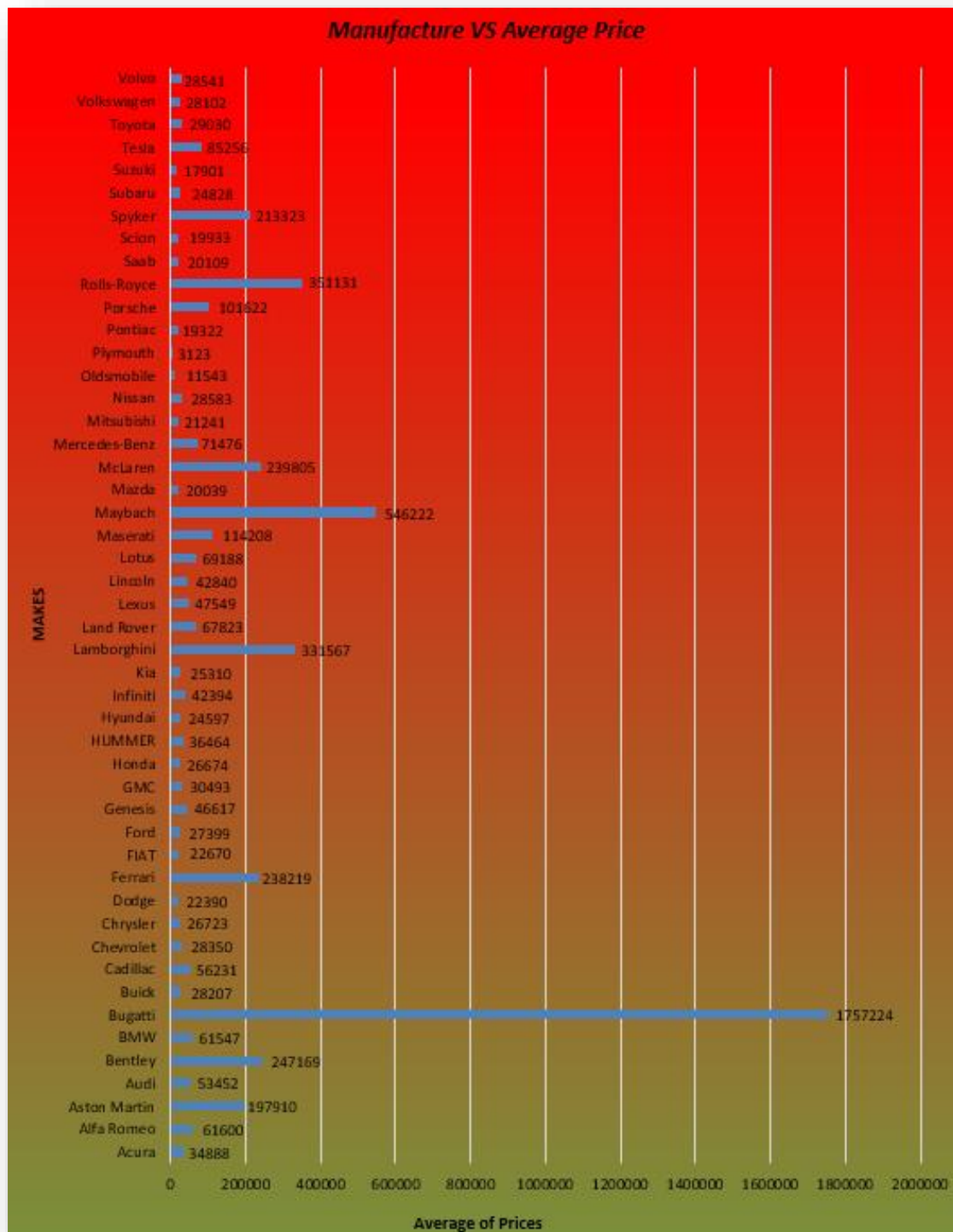
**Task 4.A:** Create a pivot table that shows the average price of cars for each manufacturer.

Row Labels	Average of MSRP	Count of Make2
Acura	34888	252
Alfa Romeo	61600	5
Aston Martin	197910	93
Audi	53452	328
Bentley	247169	74
BMW	61547	334
Bugatti	1757224	3
Buick	28207	196
Cadillac	56231	397
Chevrolet	28350	1123
Chrysler	26723	187
Dodge	22390	626
Ferrari	238219	69
FIAT	22670	62
Ford	27399	881
Genesis	46617	3
GMC	30493	515
Honda	26674	449
HUMMER	36464	17
Hyundai	24597	303
Infiniti	42394	330
Kia	25310	231
Lamborghini	331567	52
Land Rover	67823	143

Lexus	47549	202
Lincoln	42840	164
Lotus	69188	29
Maserati	114208	58
Maybach	546222	16
Mazda	20039	423
McLaren	239805	5
Mercedes-Benz	71476	353
Mitsubishi	21241	213
Nissan	28583	558
Oldsmobile	11543	150
Plymouth	3123	82
Pontiac	19322	186
Porsche	101622	136
Rolls-Royce	351131	31
Saab	20109	68
Scion	19933	60
Spyker	213323	3
Subaru	24828	256
Suzuki	17901	348
Tesla	85256	18
Toyota	29030	746
Volkswagen	28102	809
Volvo	28541	281
<b>Grand Total</b>	<b>40606</b>	<b>11868</b>

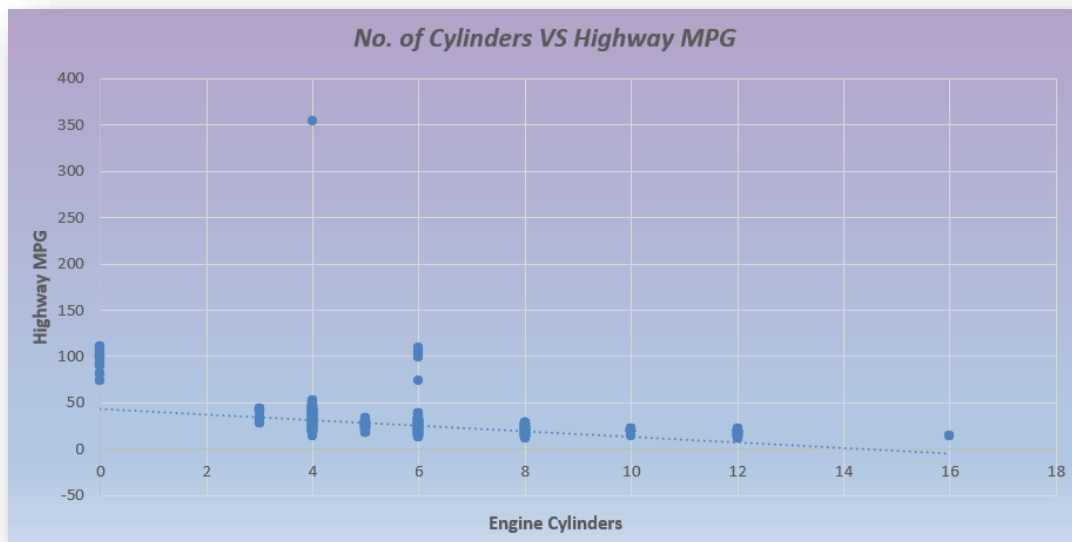
"Bugatti" stands out with the highest average prices among automotive brands. The exclusivity, luxury, and high-performance attributes associated with Bugatti cars contribute to this premium pricing. This premium reflects not only the exceptional engineering and design but also the brand's unique position in the luxury automobile market. Though the data is biased as there are cars at the cost of 2000 and the number of Bugatti is only 3. The below is the bar graph of above data.

**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.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.



After performing the analysis, it was found that there is a negative correlation between the number of cylinders and highway MPG. This means that as the number of cylinders in the engine increases, the fuel efficiency of the car decreases. The graph shows that the slope of the trendline is negative, indicating a decrease in highway MPG with an increase in the number of cylinders.

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

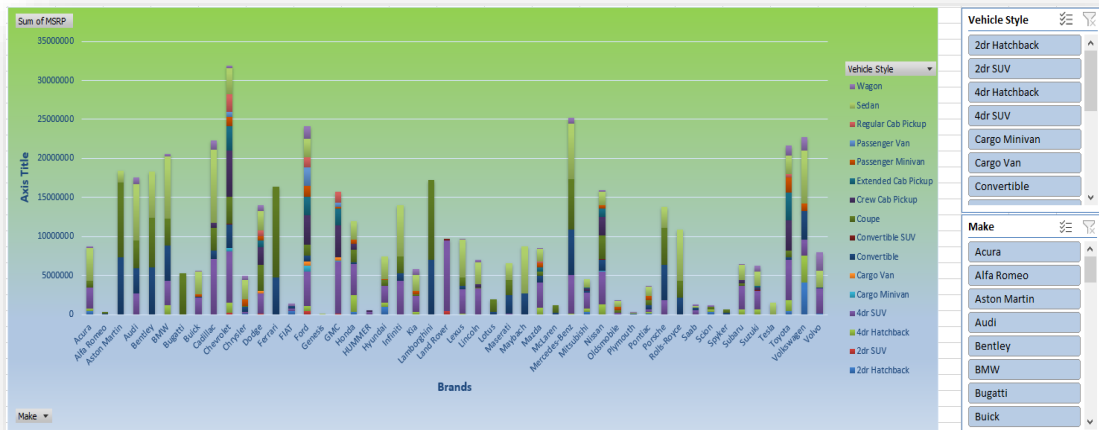
	<i>Engine Cylinders</i>	<i>highway MPG</i>
Engine Cylinders	1	
highway MPG	-0.601357778	1

FOR ANALYSIS TASK EXCEL FILE : [CLICK HERE](#) → [ANALYSIS TASK](#)

# Dashboard Task

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

**Hints:** Stacked column chart to show the distribution of car prices by brand and body style. Use filters and slicers to make the chart interactive. Calculate the total MSRP for each brand and body style using SUMIF or Pivot Tables.



Sum of MSRP	Vehicle Style	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
Acura	480917		357440	2663505				139800		793748					4204702
Alfa Romeo								178200							1448735
Aston Martin								9635275							7158348
Audi	4000			2674900				3556290							1902005
Bentley								6023870							7989300
BMW	80097		1144950	3160950				4502671		3419051					
Bugatti								5271671							
Buick				2141750				179325		18534			330065		2850590
Cadillac				7182555				985607		2933274					9418847
Chevrolet	8000	213310	1287260	6509568	420150	79688	2953145	108300		3504525	5927817	3117951	1178515	607670	3303977
Chrysler	98805			250545			630105	114510					922395		2479859
Dodge	48050	44000	18000	2972405	80520	338497	12000	3264827		2235775	884172	557425	70708	719408	2417585
Ferrari							4723811			11713289					
Fiat	420715			369305			730007	327985							
Ford	36000	479873	567615	4482771	702400	566351		780007	1398144	3812353	2285584	1411805	2431898	1299240	2299348
Genesis															139850
GMC				8641919	142750	488085		252135							
Honda	413200	144319	2088120	3953209				1588705		4061482	2183866	150000	603670	1306328	2340105
HUMMER				377480						724070					2899937
Hyundai	1038050		528880	2128890				2175750		242405					6484090
Infiniti				4340200				142630							1980360
Kia			406360	2049645				10177050							
Lamborghini															
Land Rover		476394		9076595				145781							
Lexus			94700	5152674											4837596
Lincoln				8422570				412360		25342					2854855
Lotus								1593200							
Maserati				155000				2342963		1972284					2153800
Maybach								2762750							5976800
Mercedes	22000	24000	853180	5222525			870505			543879	580033	443130		285486	1638571
McLaren								280225		918800					
Mercedes-Benz			112800	4971610	28950			3753884		6479207		51200			7080245
Mitsubishi	394888		407355	2066505	2000		209851					2000		8000	1058565
Nissan	14583		1347320	4149630	128620		1406332	131075	2943652	2422300	1026379	413320		21914	1789120
Oldsmobile				256130			2000		280515						691181
Plymouth	42000		16000				85631		14000						46759
Pontiac	183305		162975	401330			473162		667715			541192			1362079
Porsche	28527			1815200			4501585		4785593						2713500

This analysis provides insights that how car prices vary by brand and body style, which can be helpful to manufacturers to optimize their pricing strategies and increase profitability. And Slicers, enable us to drill down and see more specific details about the data.

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

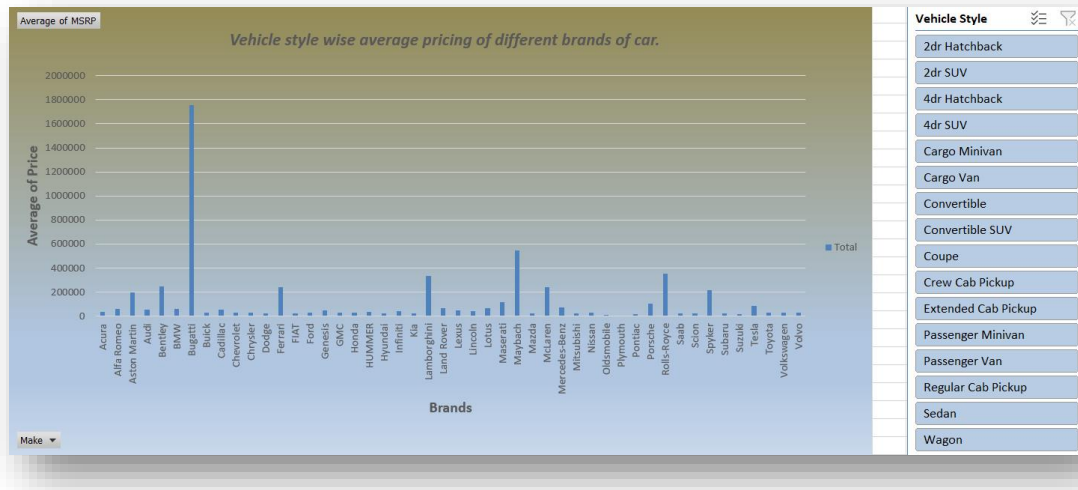
**Hints:** Clustered column chart to compare the average MSRPs across different car brands and body styles. Calculate the average MSRP for each brand and body style using AVERAGEIF or Pivot Tables.

Average of MSRP	
Make	Total
Acura	34888
Alfa Romeo	61600
Aston Martin	197910
Audi	53452
Bentley	247169
BMW	61547
Bugatti	1757224
Buick	28207
Cadillac	56231
Chevrolet	28350
Chrysler	26723
Dodge	22390
Ferrari	238219
FIAT	22670
Ford	27399
Genesis	46617
GMC	30493
Honda	26674
HUMMER	36464
Hyundai	24597
Infiniti	42394
Kia	25310
Lamborghini	331567
Land Rover	67823

Lexus	47549
Lincoln	42840
Lotus	69188
Maserati	114208
Maybach	546222
Mazda	20039
McLaren	239805
Mercedes-Benz	71476
Mitsubishi	21241
Nissan	28583
Oldsmobile	11543
Plymouth	3123
Pontiac	19322
Porsche	101622
Rolls-Royce	351131
Saab	20109
Scion	19933
Spyker	213323
Subaru	24828
Suzuki	17901
Tesla	85256
Toyota	29030
Volkswagen	28102
Volvo	28541
<b>Grand Total</b>	<b>40606</b>

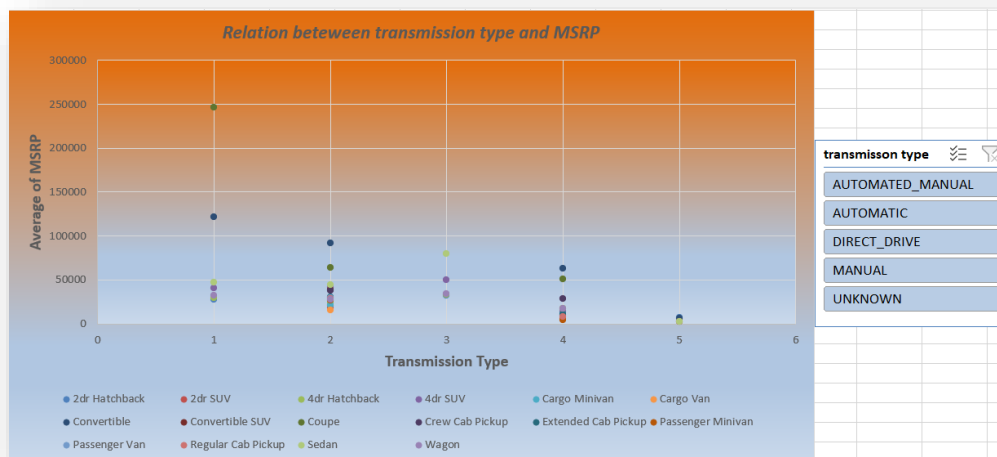
In this analysis, the observation says that some brand have significantly higher or lower average MSRP than others. For ex. Luxury brand such as BUGATI, BAYBACH and LAMBORGINI tend to have higher average MSRP compared to other brands such as BMW, TOYOTA & AUDI. Similarly vehicle style such as SEDAN, 4DR SUV & COUPE tend to have higher average MSRP compare to others.





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

**Hints:** Scatter plot chart to visualize the relationship between MSRP and transmission type, with different symbols for each body style. Calculate the average MSRP for each combination of transmission type and body style using AVERAGEIFS or Pivot Tables.



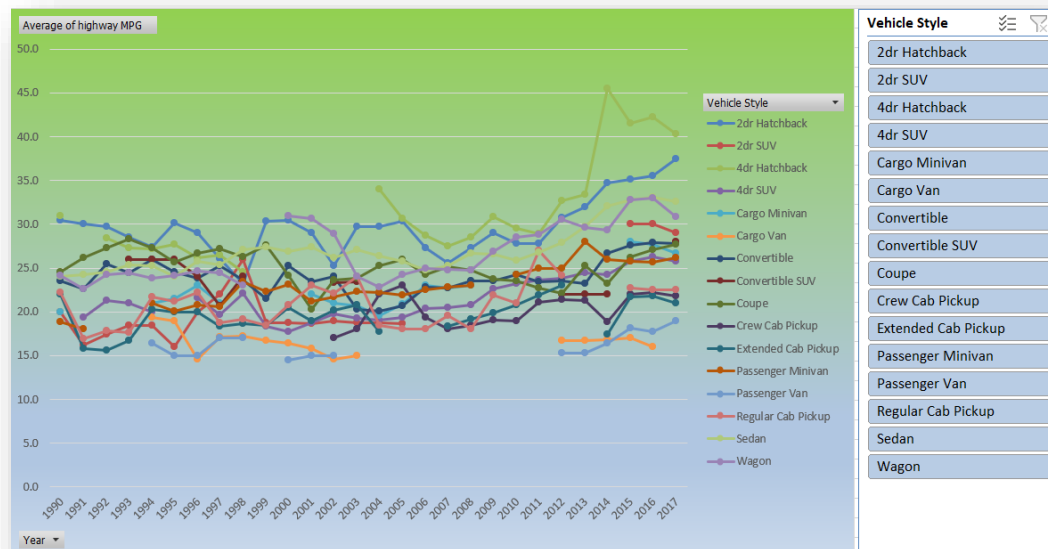
Average of MSRP	Vehicle Style	2dr SUV	4dr Hatchback	4dr SUV	Cargo Minivan	Cargo Van	Convertible	Convertible SUV	Coupe	Crew Cab Pickup	Extended Cab Pickup	Passenger Minivan	Passenger Van	Regular Cab Pickup	Sedan
Transmission Type	2dr SUV														
AUTOMATED_MANUAL	27180.96491		29248.07407	40451.15389			121256.6444		248977.4252						4741
AUTOMATIC	20916.464	18615.20455	23853.67898	41535.80646	20920.98592	15280.22105	91301.7281	58925.5	63371.81076	37744.07154	30637.94973	26412.68159	29015.20313	28536.8239	4381
DIRECT_DRIVE	31800		32799.72873	49800											1
MANUAL	13553.65831	6303.811111	17594.41313	15426.46226			62562.6877	9233.142857	50484.37241	28360.52632	10884.19455	4405.333333		7557.773333	1701
UNKNOWN	7861.5	2371					5783.5		2000					2000	
Grand Total	16867.71344	10115.18843	22420.8661	40421.87178	20920.98592	15280.22105	84629.8828	17424.13793	76248.32205	37220.46696	22488.77689	25621.05036	29015.20313	15953.70918	3921

Transmission Type	2dr SUV	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
AUTOMATED_MANUAL	27180.96491		29248.07407	40451.15389			121256.6444		248977.4252						4741
AUTOMATIC	20916.464	18615.20455	23853.67898	41535.80646	20920.98592	15280.22105	91301.7281	58925.5	63371.81076	37744.07154	30637.94973	26412.68159	29015.20313	28536.8239	4381
DIRECT_DRIVE	31800		32799.72873	49800											1
MANUAL	13553.65831	6303.811111	17594.41313	15426.46226			62562.6877	9233.142857	50484.37241	28360.52632	10884.19455	4405.333333		7557.773333	1701
UNKNOWN	7861.5	2371					5783.5		2000					2000	

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

**Hints:** Line chart to show the trend of fuel efficiency (MPG) over time for each body style. Calculate the average MPG for each combination of body style and model year using AVERAGEIFS or Pivot Tables.



The results of this analysis shows that how fuel efficiency has changed over time for different body styles, and body styles such as 4DR HATCHBACK, 2DR HATCHBACK AND SEDAN tend to be more fuel efficient overall.

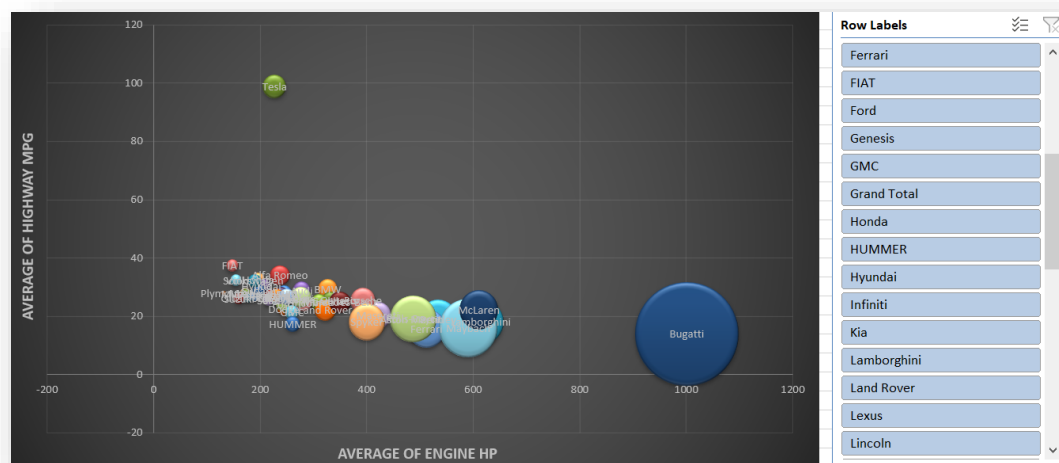
Average of highway MPG Column Labels																	
Row Labels	2dr Hatchback	2dr SUV	4dr Hatchback	4dr SUV	Cargo Minivan	Cargo Van	Convertible	Convertible SUV	Coupe	Crew Cab Pickup	Extended Cab Pickup	Passenger Minivan	Passenger Van	Regular Cab Pickup	Sedan	Wagon	
1990		30.4	20.0	31.0		20.0		23.5		24.5		22.0	18.9		22.2	24.0	24.1
1991		30.1	16.3		19.3			22.6		26.2		15.8	18.0		17.0	24.2	22.6
1992		29.7	17.5	28.4	21.3			25.5		27.3		15.6			17.9	24.5	24.3
1993		28.5	18.5	27.3	21.0			24.5		26.0	28.3	16.7			17.6	25.3	24.5
1994		27.4	18.4	27.1	20.0	21.0	19.3	26.0		26.0	27.3	20.3	21.0	16.4	21.7	25.2	23.8
1995		30.1	16.0	27.7		21.5	19.0	24.5		26.0	25.7	20.0	20.1	15.0	21.2	24.1	24.1
1996		29.0	20.0	26.1	21.6	23.0	14.6	23.8		24.0	26.7	20.0	20.8	15.0	22.2	25.7	24.7
1997		26.1	22.0	26.5	19.7	21.0	17.1	25.3		20.7	27.2	18.4	20.6	17.0	18.8	25.3	24.4
1998		23.2	26.0	24.5			17.2	23.7	24.0	26.3		18.6	23.4	17.0	19.2	27.4	23.0
1999		30.3	18.8		18.3		16.7	21.5		27.6		18.4	22.3		18.4	27.4	
2000		30.4	18.8		17.7		16.4	25.3		24.2		20.5	23.2	14.5	20.8	26.8	31.0
2001		29.0	18.7		18.7	22.0	15.8	23.4		20.3		19.0	21.2	15.0	23.0	27.4	30.6
2002		25.3	19.0		19.8	21.0	14.6	24.1	23.3	23.6	17.0	20.2	21.7	15.0	22.1	26.1	28.9
2003		29.8	18.8		19.2	20.7	15.0	20.2	23.4	23.9		20.8	22.3		24.1	27.1	24.0
2004		29.7	18.8	34.0	19.0		19.6	20.1		25.3	22.0	17.8	22.2		18.5	26.4	22.8
2005		30.3	18.7	30.6	19.3	20.9		20.7		26.0	23.0		21.9		18.0	25.8	24.3
2006		27.3		28.8	20.4	23.0		22.9		24.3	19.4		22.5		18.0	24.8	25.0
2007		25.5		27.5	20.5	22.7		22.8		25.2		18.4	22.8		19.6	25.3	24.8
2008		27.3		28.5	20.8	23.0		23.5		24.8	18.5	19.2	23.0		18.0	26.7	24.7
2009		29.0		30.8	22.6			23.5		23.7	19.1	19.9			21.9	26.6	26.8
2010		27.8		29.5	23.2			24.3		23.5	18.9	20.8	24.2		21.0	25.9	28.5
2011		27.8		28.9	23.6			23.4		22.7	21.1	21.9	25.0		27.0	26.8	28.8
2012		30.7		32.7	23.8		16.7	23.6	22.0	22.1	21.4	23.1	25.0	15.3	24.1	27.9	30.6
2013		31.9		33.4	24.5		16.7	23.2	22.0	25.3	21.3		28.0	15.3		29.8	29.6
2014		34.7		45.5	24.2		16.9	26.6	22.0	23.2	18.9	17.4	26.0	16.4		32.0	29.4
2015		35.1	30.0	41.5	25.8	28.0	17.0	27.6		26.2	22.0	21.7	25.8	18.1	22.7	32.8	32.7
2016		35.6	30.0	42.3	26.2	27.7	16.0	27.9		27.1	22.3	21.8	25.6	17.7	22.5	33.1	33.0
2017		37.4	29.0	40.3	25.8	26.7		27.8	28.0	27.7	21.8	21.0	26.1	19.0	22.5	32.6	30.9
Grand Total		31.4	19.1	37.6	24.5	24.5	16.6	25.8	23.7	25.7	21.1	20.1	23.6	17.2	20.6	30.3	28.4

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

**Hints:** Bubble chart to visualize the relationship between horsepower, MPG, and price across different car brands. Assign different colors to each brand and label the bubbles with the car model name. Calculate the average horsepower, MPG, and MSRP for each car brand using AVERAGEIFS or Pivot Tables.

Row Labels	Average of MSRP	Average of Engine HP	Average of highway MPG
Acura	34888	245	28
Alfa Romeo	61600	237	34
Aston Martin	197910	484	19
Audi	53452	278	29
Bentley	247169	534	19
BMW	61547	327	29
Bugatti	1757224	1001	14
Buick	28207	219	27
Cadillac	56231	332	25
Chevrolet	28350	247	26
Chrysler	26723	229	26
Dodge	22390	244	22
Ferrari	238219	512	16
FIAT	22670	148	37
Ford	27399	243	24
Genesis	46617	347	25
GMC	30493	260	21
Honda	26674	196	33
HUMMER	36464	261	17
Hyundai	24597	202	30
Infiniti	42394	310	25
Kia	25310	207	31
Lamborghini	331567	614	18
Land Rover	67823	322	22

Lexus	47549	277	26
Lincoln	42840	282	24
Lotus	69188	276	27
Maserati	114208	421	20
Maybach	546222	591	16
Mazda	20039	172	28
McLaren	239805	610	22
Mercedes-Benz	71476	350	25
Mitsubishi	21241	174	28
Nissan	28583	240	28
Oldsmobile	11543	177	26
Plymouth	3123	132	28
Pontiac	19322	190	27
Porsche	101622	393	25
Rolls-Royce	351131	488	19
Saab	20109	216	26
Scion	19933	154	32
Spyker	213323	400	18
Subaru	24828	197	29
Suzuki	17901	160	26
Tesla	85256	227	99
Toyota	29030	236	26
Volkswagen	28102	190	32
Volvo	28541	231	27
Grand Total	40606	249	27



The analysis says that some brands have higher average horsepower, while others have lower average horsepower the same was true for average MPG and MSRP.

FOR DASHBOARD TASK EXCEL FILE : [CLICK HERE](#) → [DASHBOARD FILE](#)

# ***THANK YOU***

FOR ANALYSIS TASK EXCEL FILE

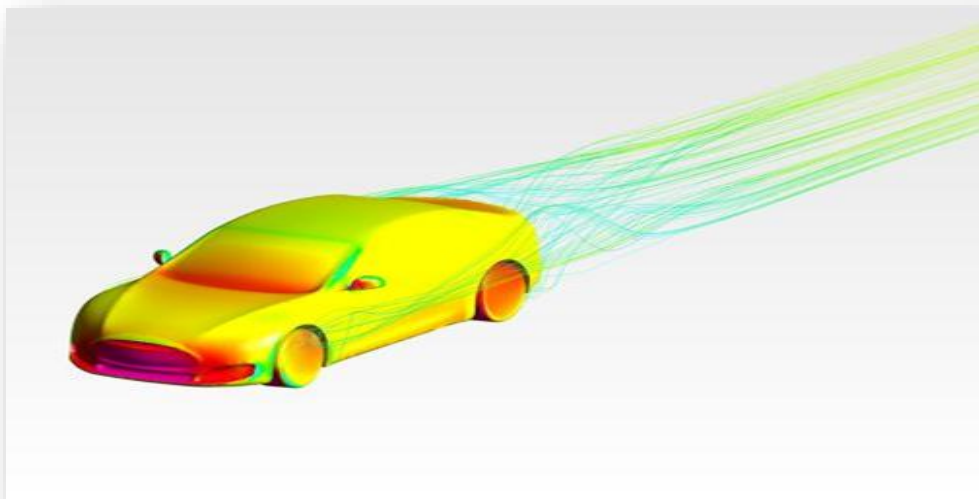


**ANALYSIS TASK**

FOR DASHBOARD TASK EXCEL FILE



**DASHBOARD FILE**



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