ANALYZING THE IMPACT OF CAR FEATURES ON PRICE AND PROFITABILITY

HYPERLINK OF MY EXCEL SHEET

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.
- 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.
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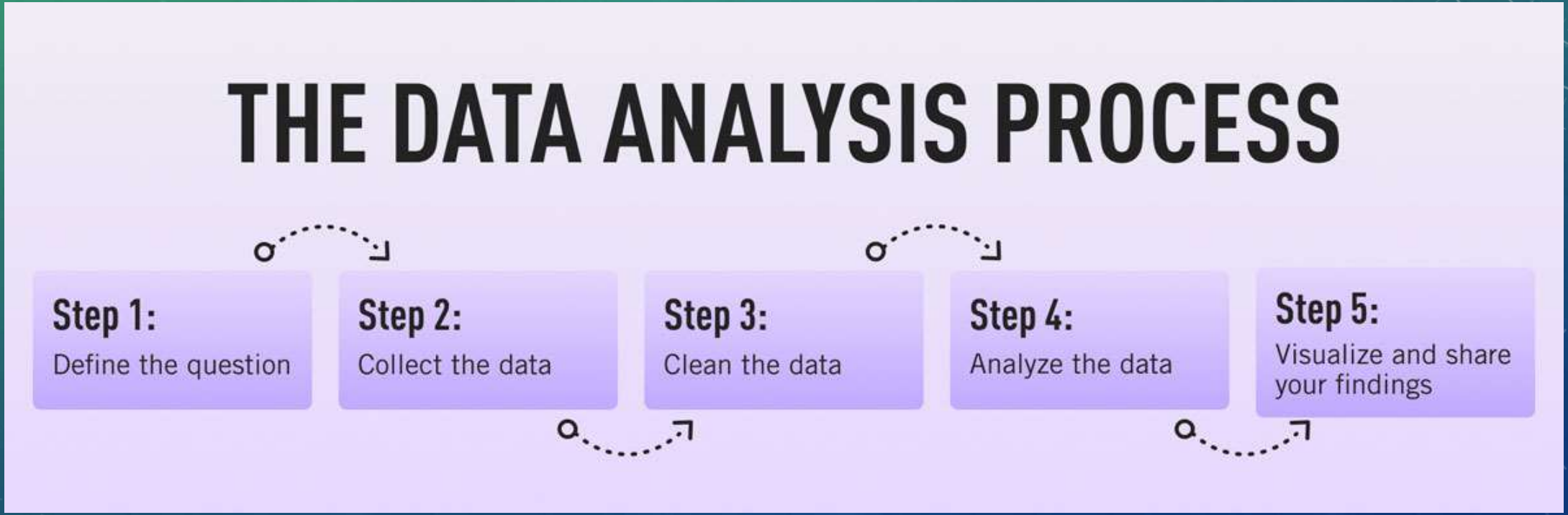
TECH-STACK USED:

- I’ve used Microsoft Power point version 2309 to create this presentation.
- I’ve used Microsoft Excel version 2309 to implement the task assigned.
- I chose Microsoft Excel because it is the most convenient spreadsheet and can be used efficiently to view statistics and analyze the data set given very quickly.

DATASET DESCRIPTION:

- The dataset contains information on various car models and their specifications, and is titled "Car Features and MSRP".
- The raw dataset contains 16 columns and 11914 rows in it.
- The dataset contains information on over 11,000 car models and their specifications, including details on the car's make, model, year, fuel type, engine power, transmission, wheels, number of doors, market category, size, style, estimated miles per gallon, popularity, and manufacturer's suggested retail price (MSRP).
- It contained 715 duplicate values which was removed.

APPROACH:


THE DATA ANALYSIS PROCESS
Step 1:
Define the question
Step 2:
Collect the data
Step 3:
Clean the data
Step 4:
Analyze the data
Step 5:
Visualize and share your findings

TASKS DESCRIPTION:

Analysis:

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

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

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

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

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

Dashboard:

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

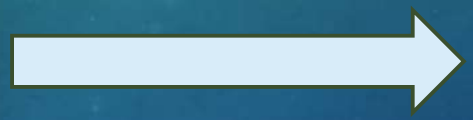
Task 2: Which car brands have the highest and lowest average MSRPs, and how does this vary by body style?

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

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

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

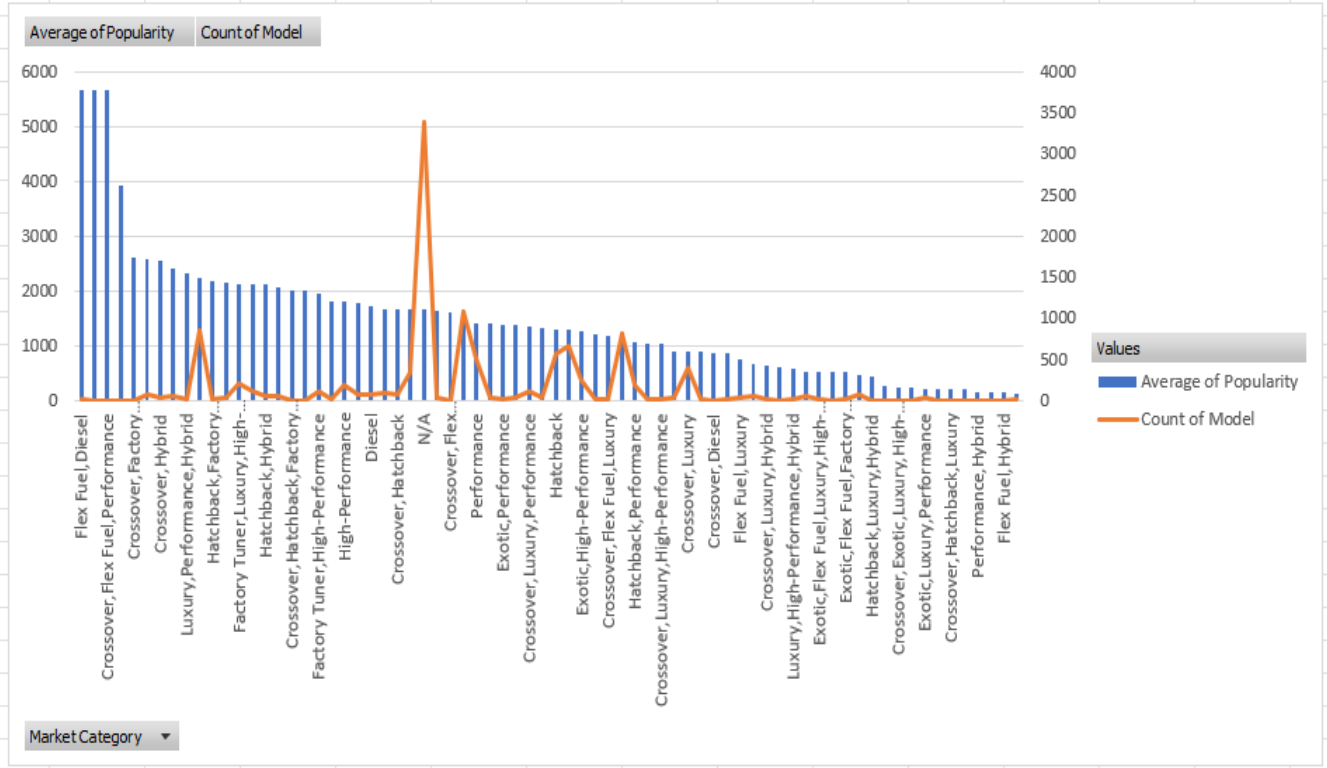
INSIGHTS



TASK 1:

- **Description :** How does the popularity of a car model vary across different market categories?
- It is divided in two parts:
- **Task 1.A:** Create a pivot table that shows the number of car models in each market category and their corresponding popularity scores.
- To implement this task I've created a pivot table which shows the count of models in each market category and also calculates the corresponding average popularity scores.
- **Task 1.B:** Create a combo chart that visualizes the relationship between market category and popularity.
- To complete this task I've created a combo column chart to visualize the relationship between market category and popularity along with the count of model.
- Through this chart we can conclude that Hatchback, Flax fuel , Diesel has the highest popularity score**.**
- Next slide contains image of the pivot table as well as the combo column chart.

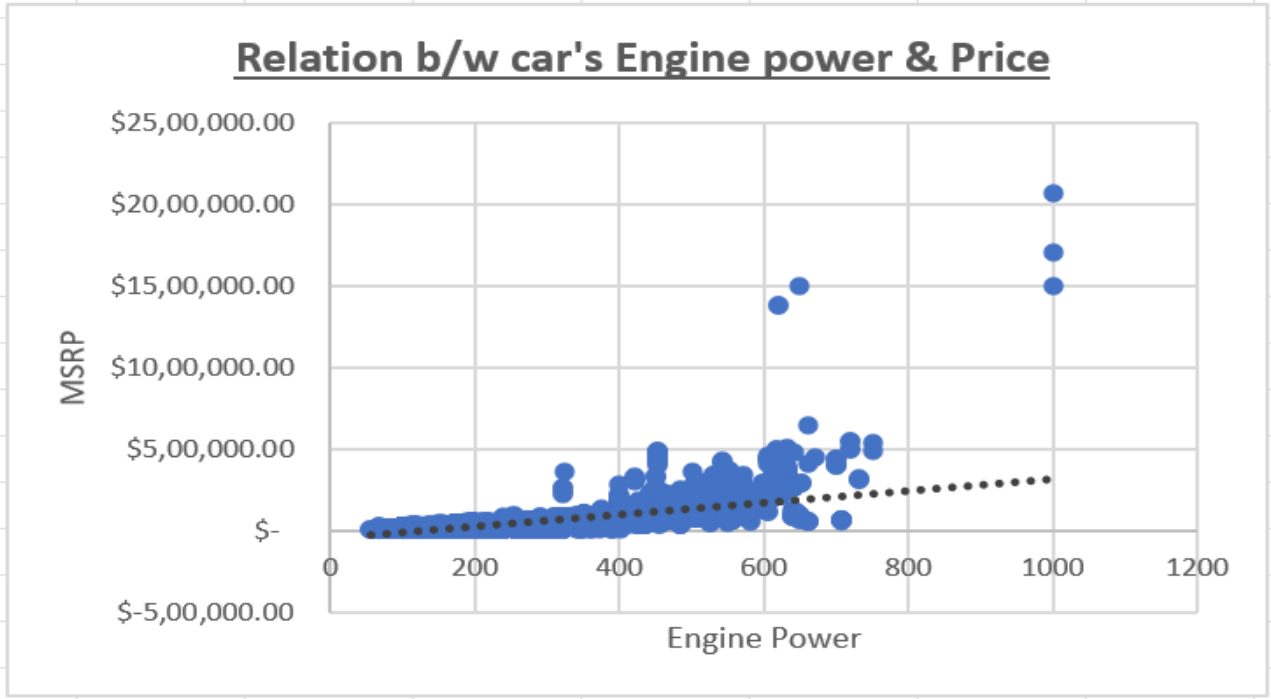
Row Labels	Average of Popularity	Count of Model
Flex Fuel,Diesel	5657	16
Hatchback,Flex Fuel	5657	7
Crossover,Flex Fuel,Performance	5657	6
Crossover,Luxury,Performance,Hybrid	3916	2
Crossover,Factory Tuner,Luxury,Performance	2607	5
Crossover,Performance	2586	69
Crossover,Hybrid	2563	42
Diesel,Luxury	2416	47
Luxury,Performance,Hybrid	2333	11
Flex Fuel	2226	855
Hatchback,Factory Tuner,Performance	2174	21
Crossover,Luxury,Diesel	2149	34
Factory Tuner,Luxury,High-Performance	2133	215
Hybrid	2117	121
Hatchback,Hybrid	2111	64
Crossover,Flex Fuel	2074	64
Crossover,Hatchback,Factory Tuner,Performance	2009	6
Crossover,Hatchback,Performance	2009	6
Factory Tuner,High-Performance	1966	104
Crossover,Factory Tuner,Luxury,High-Performance	1823	26
High-Performance	1823	198
Factory Tuner,Performance	1774	84
Diesel	1731	84
Flex Fuel,Performance	1680	87
Crossover,Hatchback	1676	72
Luxury,High-Performance	1668	334
N/A	1665	3376
Hatchback,Luxury,Performance	1632	36
Crossover,Flex Fuel,Luxury,Performance	1624	6
Crossover	1556	1075
Performance	1415	520
Factory Tuner,Luxury,Performance	1413	31
Exotic,Performance	1391	10



TASK 2:

- What is the relationship between a car's engine power and its price?
- **Description :** 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.
- In this task I've created a scatter chart that shows the relation between engine power of car and it’s price.
- The chart and the trendline concludes that engine power and price are proportional to each other because as the engine power increases the price of cars also increase.

	A	B
1	**Engine HP**	**MSRP**
2	335	$ 46,135.00
3	300	$ 40,650.00
4	300	$ 36,350.00
5	230	$ 29,450.00
6	230	$ 34,500.00
7	230	$ 31,200.00
8	300	$ 44,100.00
9	300	$ 39,300.00
10	230	$ 36,900.00
11	230	$ 37,200.00
12	300	$ 39,600.00
13	230	$ 31,500.00
14	300	$ 44,400.00
15	230	$ 37,200.00
16	230	$ 31,500.00
17	320	$ 48,250.00
18	320	$ 43,550.00
19	172	$ 2,000.00
20	172	$ 2,000.00
21	172	$ 2,000.00
22	172	$ 2,000.00
23	172	$ 2,000.00
24	172	$ 2,000.00
25	172	$ 2,000.00



TASK 3:

- Which car features are most important in determining a car's price?
- **Description:** 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.
- To implement this task I've used the feature of excel that perform the regression analysis which has helped me also to find the coefficients of car features and its price.
- I've also created a bar chart that shows the coefficient values for each variable relative to the price.
- The chart shows that Engine Cylinders is one of the important features that is used to determine the car's price.
- Next slide has the image of regression analysis summary and the bar chart.

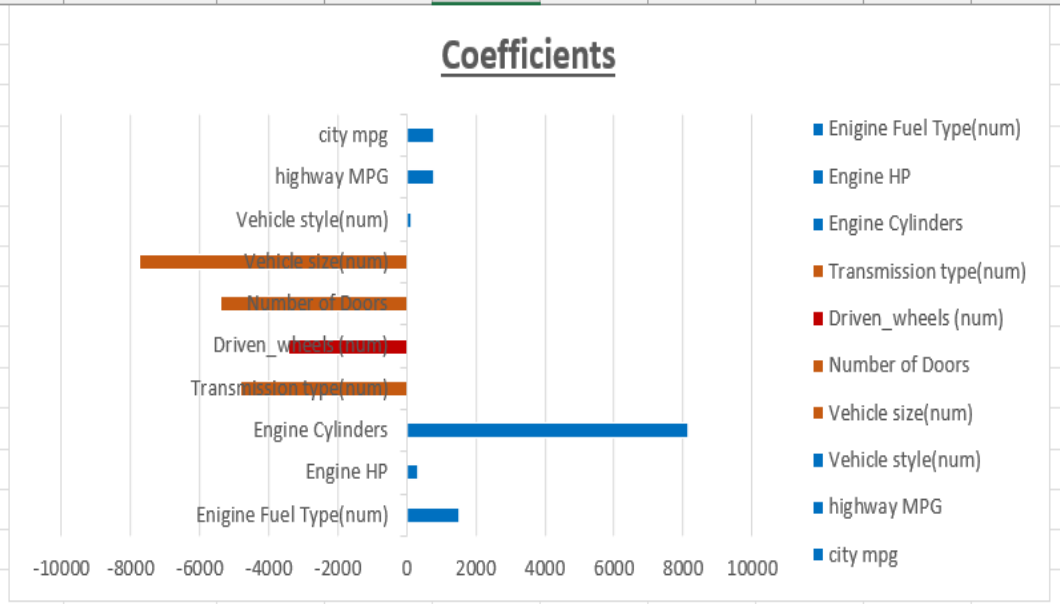
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.68500198
R Square	0.46922772
Adjusted R Square	0.46875331
Standard Error	44850.8484
Observations	11199

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	10	1.98962E+13	1.9896E+12	989.071945	0
Residual	11188	2.25058E+13	2011598599		
Total	11198	4.24019E+13			

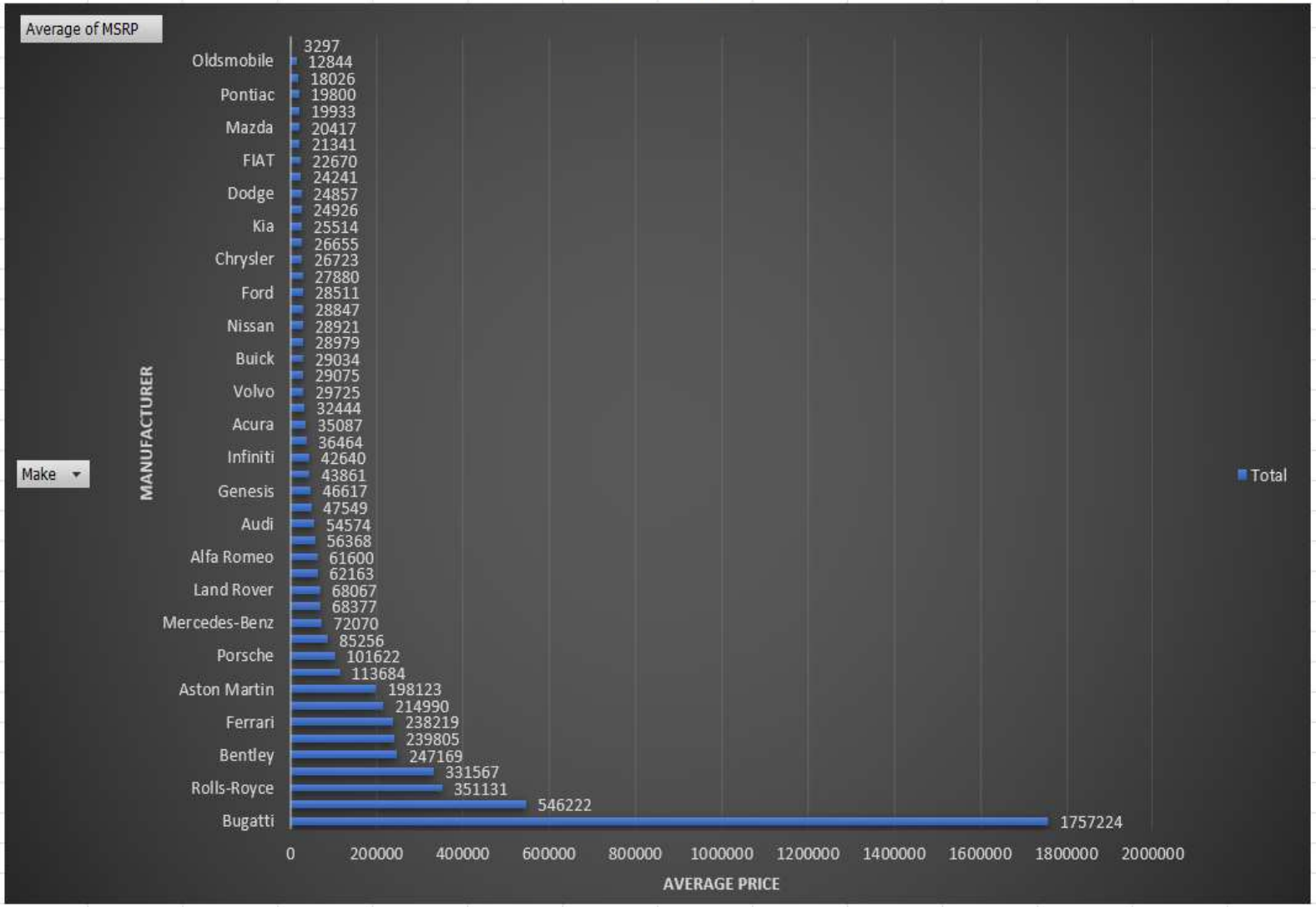
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-78799.7643	5936.067973	-13.2747409	6.4965E-40	-90435.5025	-67164.0261	-90435.5025	-67164.0261
Enigine Fuel Type(num)	1498.32274	377.9148773	3.96470958	7.3943E-05	757.543047	2239.10243	757.543047	2239.10243
Engine HP	309.165445	6.480453137	47.7073808	0	296.462616	321.868274	296.462616	321.868274
Engine Cylinders	8152.49972	440.9450226	18.4886988	3.3404E-75	7288.16985	9016.82959	7288.16985	9016.82959
Transmission type(num)	-4809.21969	532.2161283	-9.03621561	1.8879E-19	-5852.45699	-3765.98238	-5852.45699	-3765.98238
Driven_wheels (num)	-3441.4967	418.8892316	-8.2157679	2.3401E-16	-4262.59334	-2620.40007	-4262.59334	-2620.40007
Number of Doors	-5385.83588	560.8097482	-9.60367737	9.3576E-22	-6485.12172	-4286.55005	-6485.12172	-4286.55005
Vehicle size(num)	-7761.24162	535.9232961	-14.4820008	4.1952E-47	-8811.74563	-6710.73762	-8811.74563	-6710.73762
Vehicle style(num)	130.695452	91.40242741	1.42989038	0.15277641	-48.4693969	309.8603	-48.4693969	309.8603
highway MPG	797.599744	107.5392484	7.41682461	1.2864E-13	586.803886	1008.3956	586.803886	1008.3956
city mpg	793.794374	102.5850507	7.73791472	1.0975E-14	592.709615	994.879133	592.709615	994.879133



TASK 4:

- **Description :** 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.
- To implement this task I've created a pivot table that calculates the average price of the cars based on their brands.
- **Task 4.B:** Create a bar chart or a horizontal stacked bar chart that visualizes the relationship between manufacturer and average price.
- To implement this task I've created a bar chart that visualizes the relationship between manufacturers and their average price.
- From the chart we can conclude that Bugatti has the highest car price and Plymouth has the lowest.
- Next slide has the image of both the pivot table and the bar chart.

MSRP	Row Labels	Average of MSRP
46135	Bugatti	1757224
40650	Maybach	546222
36350	Rolls-Royce	351131
29450	Lamborghini	331567
34500	Bentley	247169
31200	McLaren	239805
44100	Ferrari	238219
39300	Spyker	214990
36900	Aston Martin	198123
37200	Maserati	113684
39600	Porsche	101622
31500	Tesla	85256
44400	Mercedes-Benz	72070
37200	Lotus	68377
48250	Land Rover	68067
43550	BMW	62163
2000	Alfa Romeo	61600
2000	Cadillac	56368
2000	Audi	54574
2000	Lexus	47549
2000	Genesis	46617
2000	Lincoln	43861
2000	Infiniti	42640
2000	HUMMER	36464
2000	Acura	35087
2000	GMC	32444
2000	Volvo	29725
27495	Chevrolet	29075
24995	Buick	29034
28195	Volkswagen	28979
2000	Nissan	28921



TASK 5:

- **Description :** 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.
- To implement this task I first created the pivot table that contains the average highway MPG and also created a scatter plot and a trendline that estimate the slope of their relationship.
- **Task 5.B:** Calculate the correlation coefficient between the number of cylinders and highway MPG to quantify the strength and direction of the relationship.
- To complete this task I've used CORREL function of the Excel that calculates the correlation coefficient between no . of cylinders and highway MPG.
- I've concluded from the scatter plot chart that as the number of cylinders increases the efficiency decreases.

Engine Cylinders	highway MPG
6	26
6	28
6	28
6	28
6	28
6	28
6	26
6	28
6	28
6	27
6	28
6	28
6	28
6	28
6	25
6	28
6	24
6	20
6	21
6	24
6	20
6	21
6	21
6	22

Correlation -0.61742

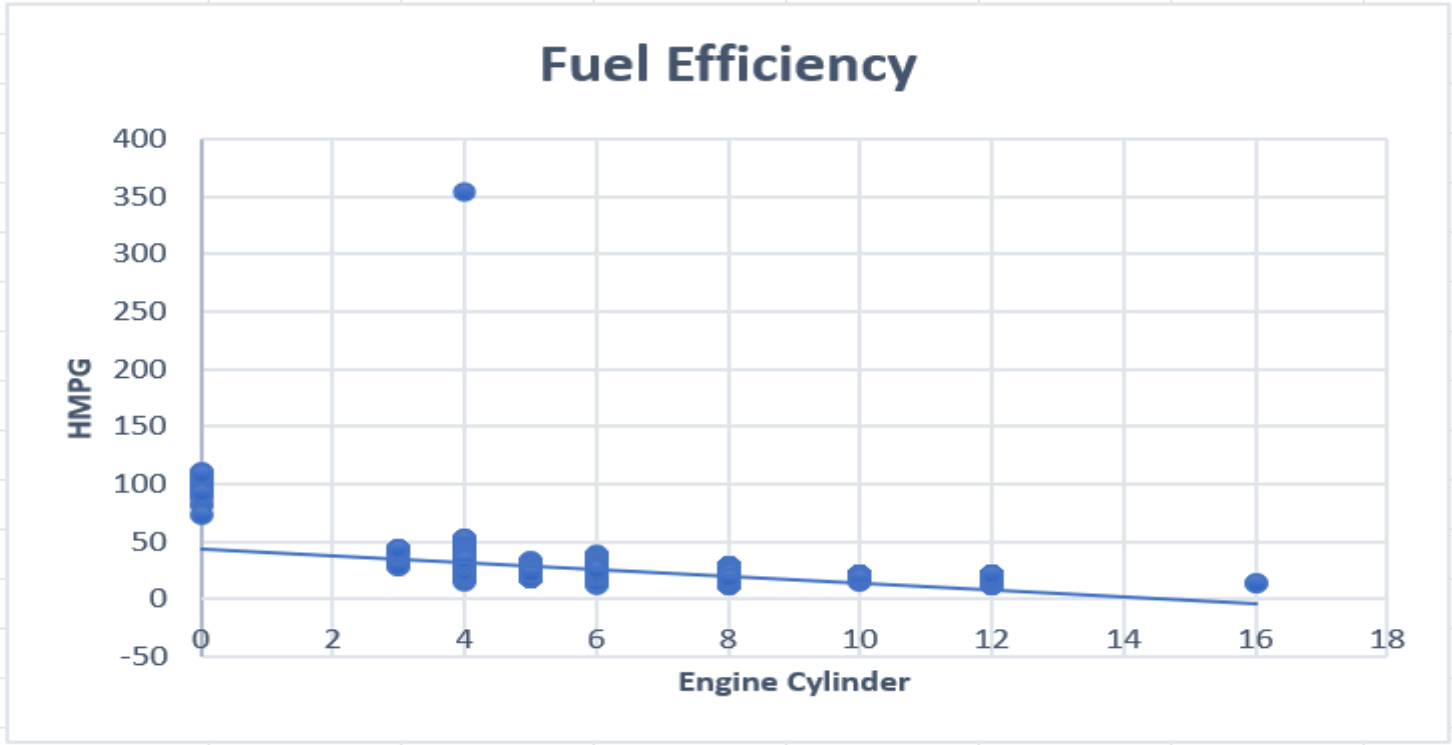


Chart1 | Task 1 B | task 1 A | Task 3 | Task 4 A & B | Task 5 A | Task 5 B | D1

BUILDING DASHBOARDS-TASK 1:

- **Description:** How does the distribution of car prices vary by brand and body style?
- To implement this task I've created a pivot table that calculates the prices of all the brands further categorized into body style.
- With the help of this table I've created a stacked column chart that shows the distribution of car prices by brand and body style . I've used filters and slicers to make the chart interactive.
- From the stacked column chart we conclude that Chevrolet has the most number of body styles contributing to the prices.

Sum of MSRP	Body Type															
Brands	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	Grand Total
Volvo	157550			3131700			121600		6000						2072945	2416971	7906766
Volkswagen	2606540		2699540	2084955			2296916		6000			906430			4434595	1424825	16459801
Toyota	473750		1397750	5106450			386668		811995	3131895	3491424	1952518		369446	2380826	1237955	20740677
Tesla															1534600		1534600
Suzuki	44496	12000	584387	2303493				120194		304131	259659				1852967	683707	6165034
Subaru	12000		678060	2539900					354476	365975					1833110	10000	5793521
Spyker							219990		209990								429980
Scion	366325		282470						330210						32500	184445	1195950
Saab	12000		34586	541905			632628								1066500	751280	3038899
Rolls-Royce							2141365		2204675						6539010		10885050
Porsche	28827			1815200			4504586		4758533						2713500		13820646
Pontiac	163505		162975	401550			473481		663715			541192			1156535	20855	3583808
Plymouth	40000		14000				85631		8000			31688			38759	16000	234078
Oldsmobile				238150			2000		276015			492055			667161	20000	1695381
Nissan	14683		1347320	4149630	128620		1406552	131075	2937632	2422300	1026379	413320		19914	1763130	175000	15935555
Mitsubishi	370169		403835	2009807	2000		209893			240210	134360	2000		8000	1058563		4438837
Mercedes-Benz			122800	4974610	28950		5753964		6473107			32500			6543743	646035	24575709
McLaren							280225		918800								1199025
Mazda	18000	12000	853180	3175515			870505		541879		580033	443130		265486	1618571	33350	8411649
Maybach							2762750								5976800		8739550
Maserati				155000			2342963		1972284						1782400		6252647
Lotus							413260		1501300								1914560
Lincoln				3422570					17342	453260					2854855	269705	7017732
Lexus			94700	3152974			472065		1016472						4837596	31105	9604912
Land Rover		476394		8839200				145731									9461325
Lamborghini							7064450		10177050								17241500
Kia			406960	2049645					142630			494650			1976360	772405	5842650
Infiniti				4340200			980050		2175750						6490009		13986009
Hyundai	789650		528880	1994390					685920			133075			2323987		6455902
HUMMER				377490						242405							619895
Honda	413200		1919260	3800589			252135		1588705	750215		553185			2264390		11541679
GMC		128319		6633919	142750	460085				4062482	2175866	150630	599670	1284328			15638049
Genesis															139850		139850
Ford	24000	467873	567615	4482771	415630	556351	730007		1398144	3782518	2285584	1179285	2429898	1299240	2279348	1623565	23521829
FIAT	420715			369305			327965									287570	1405555
Ferrari							4723811		11713289								16437100
Dodge	38000	12000	16000	2462875	60520	338497	6000		2973842	2072780	684682	557425	70708	653408	2409585	793055	13149377
Chrysler	98805			250545			630105		114510			922295			2479859	501075	4997194
Chevrolet	8000	193310	1287260	6509468	420150	74688	2953245	106300	3504525	5927617	3117951	1047240	599670	2260032	3177797	300675	31487928
Cadillac				7182555			985607		2953574	599150					9416847	1184100	22321833
Buick				2141770			179325		18534			330065			2838590	8212	5516496
Bugatti									5271671								5271671
BMW	80097		1103100	3160950			4403171		3304051						7829700	259600	20140669
Bentley							6012870		6356760						5920900		18290530
Audi	4000			2674900			3291405		3556290						7144348	847350	17518293
Aston Martin							7321655		9258845						1448735		18029235
Alfa Romeo							129800		178200								308000

Chart1 | Task 1 B | task 1 A | Task 3 | Task 4 A & B | Task 5 A | Task 5 B | D1

Aston Martin							7321655		9258845				
Alfa Romeo							129800		178200				
Acura	480917		357440	2663505					793748				
Grand Total	**6665229**	**1301896**	**14862118**	**99137486**	**1198620**	**1429621**	**65368643**	**503300**	**91174463**	**24354938**	**13755938**	**10182683**	**369**

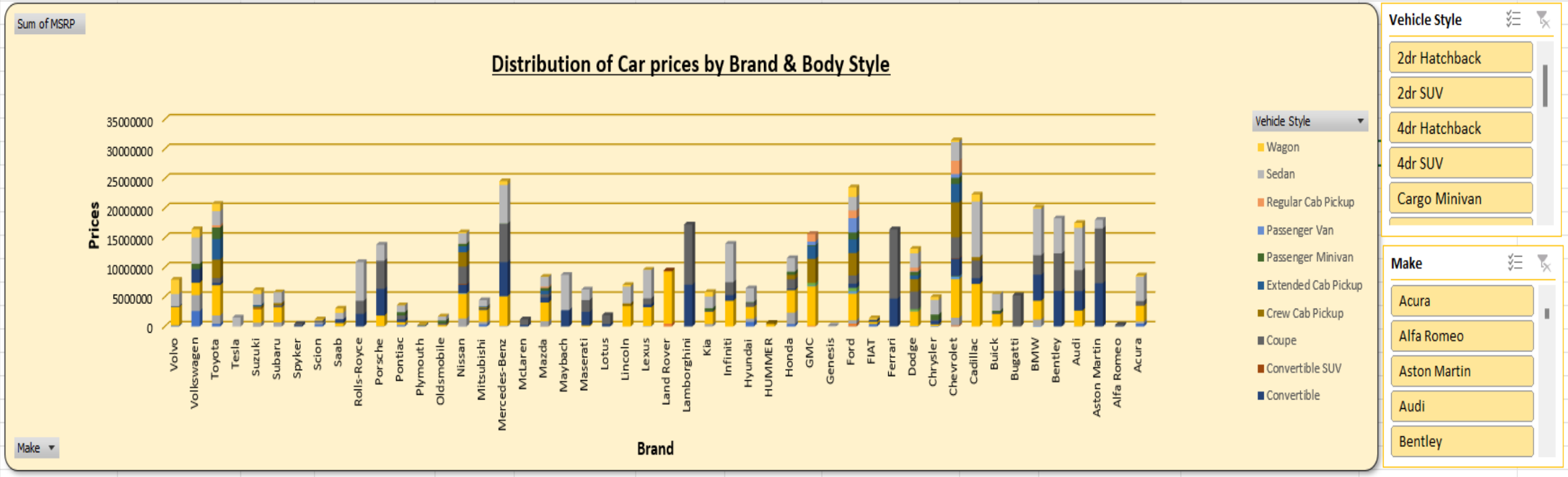


Chart1 | Task 1 B | task 1 A | Task 3 | Task 4 A & B | Task 5 A | Task 5 B | D1

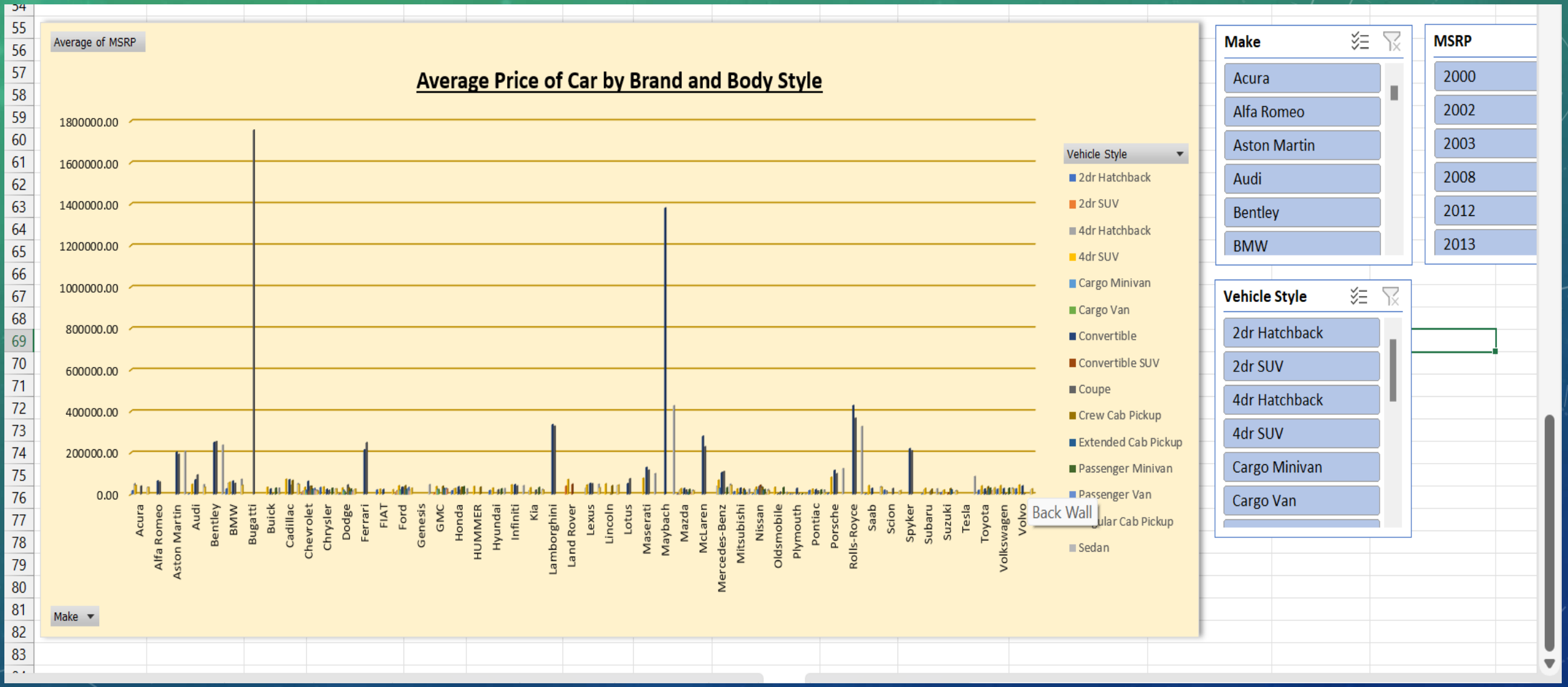
BUILDING DASHBOARDS-TASK 2:

- **Description:** Which car brands have the highest and lowest average MSRPs, and how does this vary by body style?
- To implement this task I created a pivot table to get the average of prices of car by Brand and Body style.
- To visualize the results I've created a clustered column chart .
- We can conclude that the Coupe style of Bugatti and convertible style of Maybach has the highest contribution to the prices. The brand Acura with body type Coupe and Sedan has the lowest average prices.
- The image of the pivot table and chart is shown in the next slide.

Average of MSRP	Body Style																
Brands	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	Grand Total
Acura	17175.61		51062.86	42959.76					39687.40						33614.24	33560.00	35087.49
Alfa Romeo							64900.00		59400.00								61600.00
Aston Martin							203379.31		192892.60						206962.14		198123.46
Audi	2000.00			48634.55			70029.89		93586.58						46391.87	33894.00	54574.12
Bentley							250536.25		254270.40						236836.00		247169.32
BMW	26699.00		55155.00	58536.11			63814.07		52445.25						71832.11	43266.67	62162.56
Bugatti									1757223.67								1757223.67
Buick				33996.35			25617.86		2059.33			30005.91			29568.65	2053.00	29034.19
Cadillac				72551.06			70400.50		45439.60	66572.22					51178.52	47364.00	56368.27
Chevrolet	2000.00	13807.86	18930.29	33553.96	20007.14	8298.67	62835.00	17716.67	38939.17	39255.74	24170.16	24934.29	28555.71	19824.84	20635.05	15825.00	29074.73
Chrysler	32935.00			35792.14			24234.81		19085.00			29751.45			26103.78	26372.37	26722.96
Dodge	2000.00	2000.00	2000.00	31175.63	20173.33	12536.93	2000.00		45058.21	31405.76	16301.95	25337.50	14141.60	14850.18	22519.49	24782.97	24857.05
Ferrari							214718.68		249218.91								238218.84
FIAT	21035.75			24620.33			23426.07									22120.77	22670.24
Ford	2000.00	16133.55	19572.93	41507.14	19791.90	20605.59	34762.24		34101.07	41566.13	23808.17	23123.24	32836.46	17797.81	23258.65	30066.02	28511.31
Genesis															46616.67		46616.67
GMC		7128.83		37479.77	23791.67	21908.81				39062.33	27895.72	25105.00	28555.71	25182.90			32444.09
Honda	17216.67		26656.39	28575.86			36019.29		21763.08	34100.68		36879.00			26027.47		26655.15
HUMMER				37749.00						34629.29							36464.41
Hyundai	18363.95		17629.33	30218.03					22126.45			26615.00			27666.51		24926.26
Infiniti				45686.32			46669.05		40291.67						41076.01		42640.27
Kia			19379.05	31533.00					20375.71			32976.67			23811.57	20326.45	25513.76
Lamborghini							336402.38		328291.94								331567.31
Land Rover		39699.50		71283.87				48577.00									68067.09
Lexus			31566.67	45042.49			52451.67		50823.60						48864.61	31105.00	47549.07
Lincoln				50331.91					2167.75	41205.45					42609.78	44950.83	43860.83
Lotus							51657.50		75065.00								68377.14
Maserati				77500.00			130164.61		116016.71						99022.22		113684.49
Maybach							1381375.00								426914.29		546221.88
Mazda	2000.00	2000.00	20809.27	27141.15			28080.81		20841.50		11600.66	23322.63		9154.69	19738.67	16675.00	20416.62
McLaren							280225.00		229700.00								239805.00
Mercedes-Benz			40933.33	68145.34	28950.00		104617.53		109713.68			32500.00			48833.90	43069.00	72069.53
Mitsubishi	12764.45		13925.34	26101.39	2000.00		29984.71			26690.00	19194.29	2000.00		2000.00	24058.25		21340.56
Nissan	2097.57		24059.29	34294.46	21436.67		39070.89	43691.67	35393.16	32733.78	20527.58	22962.22		2212.67	22604.23	17500.00	28921.15
Oldsmobile				34021.43			2000.00		10615.96			32803.67			9139.19	2000.00	12843.80

Legend

Task 1 P | task 1 A | Task 2 | Task 4 A & B | Task 5 A | Task 5 B | D1 | D2 | D2

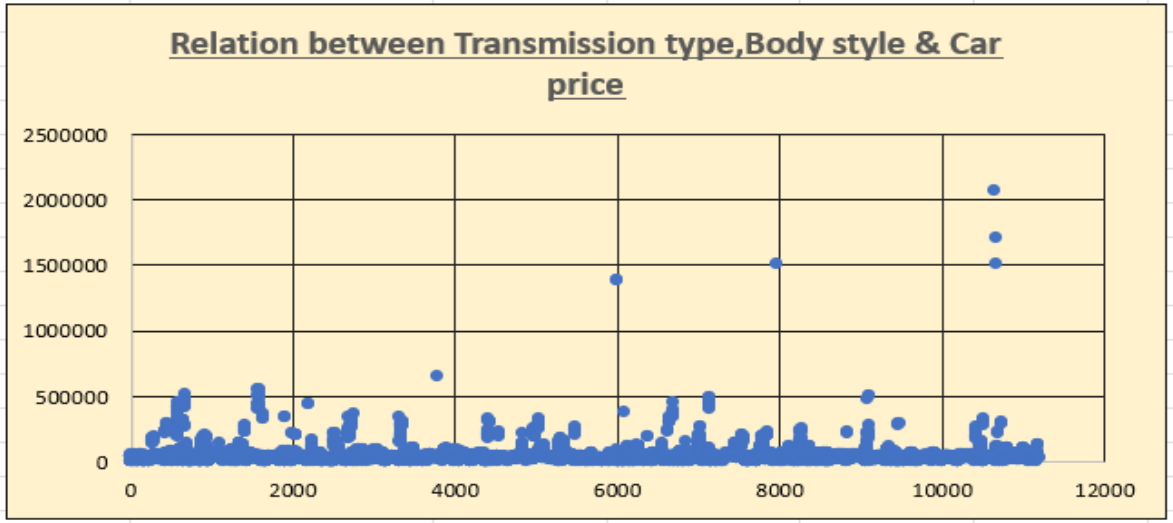

Average of MSRP
Average Price of Car by Brand and Body Style
1800000.00
1600000.00
1400000.00
1200000.00
1000000.00
800000.00
600000.00
400000.00
200000.00
0.00
Acura
Alfa Romeo
Aston Martin
Audi
Bentley
BMW
Bugatti
Buick
Cadillac
Chevrolet
Chrysler
Dodge
Ferrari
FIAT
Ford
Genesis
GMC
Honda
HUMMER
Hyundai
Infiniti
Kia
Lamborghini
Land Rover
Lexus
Lincoln
Lotus
Maserati
Maybach
Mazda
McLaren
Mercedes-Benz
Mitsubishi
Nissan
Oldsmobile
Plymouth
Pontiac
Porsche
Rolls-Royce
Saab
Scion
Spyker
Subaru
Suzuki
Tesla
Toyota
Volkswagen
Volvo
Back Wall
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
Sedan
Make
Make
Acura
Alfa Romeo
Aston Martin
Audi
Bentley
BMW
MSRP
2000
2002
2003
2008
2012
2013
Vehicle Style
2dr Hatchback
2dr SUV
4dr Hatchback
4dr SUV
Cargo Minivan
Cargo Van

BUILDING DASHBOARDS-TASK 3:

- **Description :** How do the different feature such as transmission type affect the MSRP, and how does this vary by body style?
- To implement this task I've created a pivot table that calculates the average price for each combination of transmission type and body style.
- Then I've also created a scatter plot chart to visualize the relationship between MSRP and transmission type, with different symbols for each body style.

- From the chart we can observe that automated manual coupe is contributing the most to the MSRP's.

Body Type	AUTOMATED_MANUAL	AUTOMATIC	DIRECT_DRIVE	MANUAL	UNKNOWN	Grand Total
2dr Hatchback	27470.4	20784.1	31800.0	12840.7	7361.5	16177.7
2dr SUV		24153.6		9173.0	2371.0	14306.5
4dr Hatchback	29347.0	23888.7	32799.7	17500.4		22416.5
4dr SUV	40451.2	41638.3	49800.0	17422.1		40730.3
Cargo Minivan		20315.6				20315.6
Cargo Van		17019.3				17019.3
Convertible	129082.2	95153.3		64794.3	5783.5	88216.8
Convertible SUV		38925.5		9594.8		17975.0
Coupe	245977.4	64523.4		50901.5	2000.0	77595.3
Crew Cab Pickup		37719.0		28233.1		37183.1
Extended Cab Pickup		30711.5		11553.3		23041.8
Passenger Minivan		26589.5		6510.0		26176.6
Passenger Van		30578.1				30578.1
Regular Cab Pickup		28536.8		8759.5	2000.0	17854.6
Sedan	50385.4	44671.4	79512.3	17557.3	2000.0	40462.0
Wagon	31985.3	28219.5	34250.0	18398.6		26156.9
Grand Total	**108718.9873**	**41816.12431**	**47351.25**	**28267.91989**	**3647.833333**	**41925.92714**

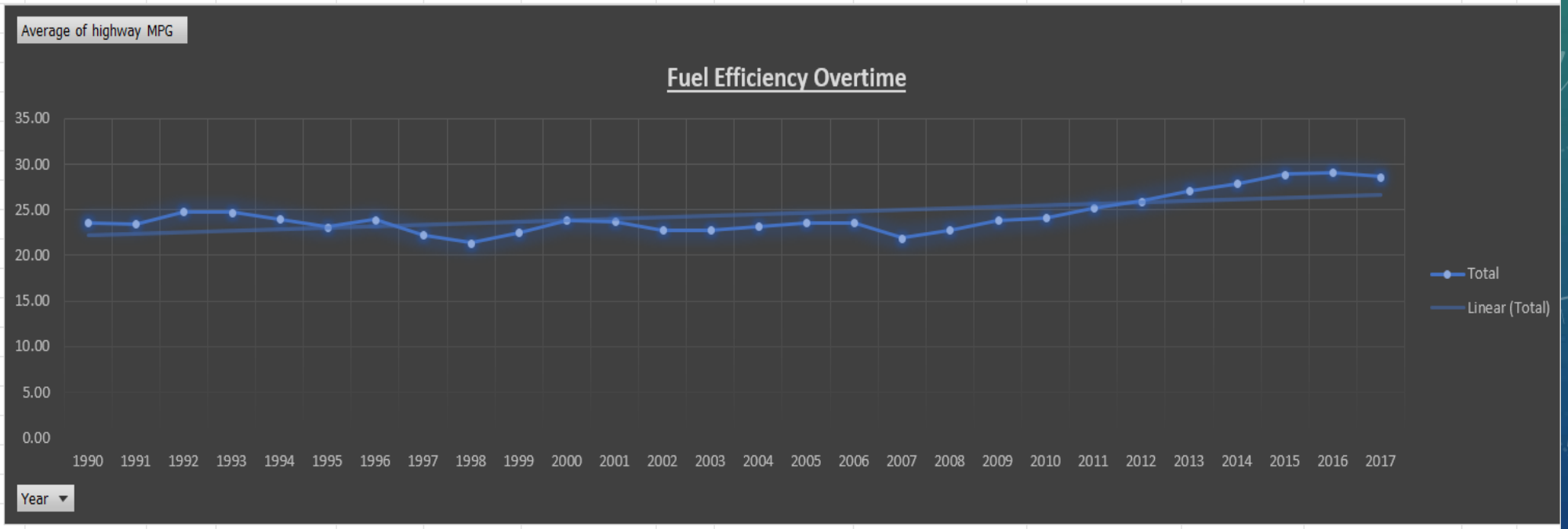


MANUAL	Coupe	46135
MANUAL	Convertible	40650
MANUAL	Coupe	36350
MANUAL	Coupe	29450
MANUAL	Convertible	34500
MANUAL	Coupe	31200
MANUAL	Convertible	44100
MANUAL	Coupe	39300
MANUAL	Convertible	36900
MANUAL	Convertible	37200
MANUAL	Coupe	39600
MANUAL	Coupe	31500
MANUAL	Convertible	44400
MANUAL	Convertible	37200
MANUAL	Convertible	48250
MANUAL	Coupe	43550
MANUAL	Sedan	2000
AUTOMATIC	Wagon	2000
MANUAL	Sedan	2000
MANUAL	Sedan	2000
AUTOMATIC	Wagon	2000
MANUAL	Sedan	2000
AUTOMATIC	Wagon	2000
MANUAL	Sedan	2000
MANUAL	Sedan	2000
AUTOMATIC	Sedan	2000
AUTOMATIC	Wagon	2000
MANUAL	Convertible	27495
MANUAL	Convertible	24995
MANUAL	Convertible	28195
MANUAL	Sedan	2000
MANUAL	Sedan	2000
MANUAL	Sedan	2000
MANUAL	Sedan	2000
MANUAL	Sedan	2000

BUILDING DASHBOARDS-TASK 4:

- **Description:** How does the fuel efficiency of cars vary across different body styles and model years?
- To implement this task I've created a pivot table to calculate the average MPG for every year and line chart to show the trend of fuel efficiency (MPG) over time for each body style.
- The line chart also shows that as the time passed fuel efficiency has increased.
- I've also created a pivot table that calculates the average MPG for each combination of body style and model year .
- The image is in the next slide.

Row Labels	Average of highway MPG
1990	23.58
1991	23.46
1992	24.77
1993	24.71
1994	23.95
1995	23.09
1996	23.90
1997	22.25
1998	21.38
1999	22.52
2000	23.84
2001	23.71
2002	22.77
2003	22.74
2004	23.15
2005	23.59
2006	23.54
2007	21.87
2008	22.75
2009	23.81
2010	24.12
2011	25.18
2012	25.90
2013	27.07
2014	27.84
2015	28.88
2016	29.10



Average of MPG For each combination of Body type & Year

Average of higl 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	Grand Total
1990	30	20	31		20		24		24		22	20		22	24	24	24
1991	30	16		20			23		26		16	18		17	24	23	23
1992	29	18	28	21			24		28		15			18	24	24	25
1993	28	19	28	21			24	26	27		17			18	25	24	25
1994	27	18	27	20	21	19	26	26	26		20	21	16	21	25	24	24
1995	29	16	28		22	18	25	26	26		20	20	15	20	24	24	23
1996	29	20	26	21	23	15	24	24	27		20	21	15	22	26	25	24
1997	26	22	27	20	21	17	25	21	27		18	21	17	19	25	24	22
1998	23	26	25	22		17	24	24	26		19	23	17	19	26	23	21
1999	30	19		18		17	22		27		18	22		18	27		23
2000	30	19		18		16	25		24		21	23	15	21	27	31	24
2001	29	19		19	22	16	23		20		19	21	15	23	27	31	24
2002	25	19		20	21	15	24	23	24	17	20	22	15	22	26	29	23
2003	30	19		19	21	15	20	23	24	18	21	22		24	27	24	23
2004	30	19	34	19	20		20		25	22	18	22		18	26	23	23
2005	30	19	31	19	21		21		26	23		22		18	26	24	24
2006	27		29	20	23		23		24	19		22		18	25	25	24
2007	25		27	20	23		23		25	18	18	23		20	25	25	22
2008	26		28	21	23		23		25	18	19	23		18	27	25	23
2009	29		31	23			24		24	19	20			22	27	27	24
2010	27		30	23			24		24	19	21	24		21	26	28	24
2011	28		29	24			24		23	21	22	25		27	27	29	25
2012	30		32	24		17	24	22	22	21	23	25	15	24	28	30	26
2013	32		33	24		17	23	22	25	21		28	15		29	29	27
2014	35		45	24		17	26	22	23	19	17	26	16		32	29	28
2015	36	30	42	26	28	17	27		26	22	22	26	18	23	33	33	29
2016	36	30	42	26	27	16	28		27	22	22	26	18	23	33	33	29
2017	37	29	40	26	27		28	28	28	22	21	26	19	23	33	31	29
Grand Total	**31**	**20**	**38**	**25**	**24**	**17**	**25**	**24**	**26**	**21**	**20**	**24**	**17**	**21**	**30**	**28**	**27**

Vehicle Style

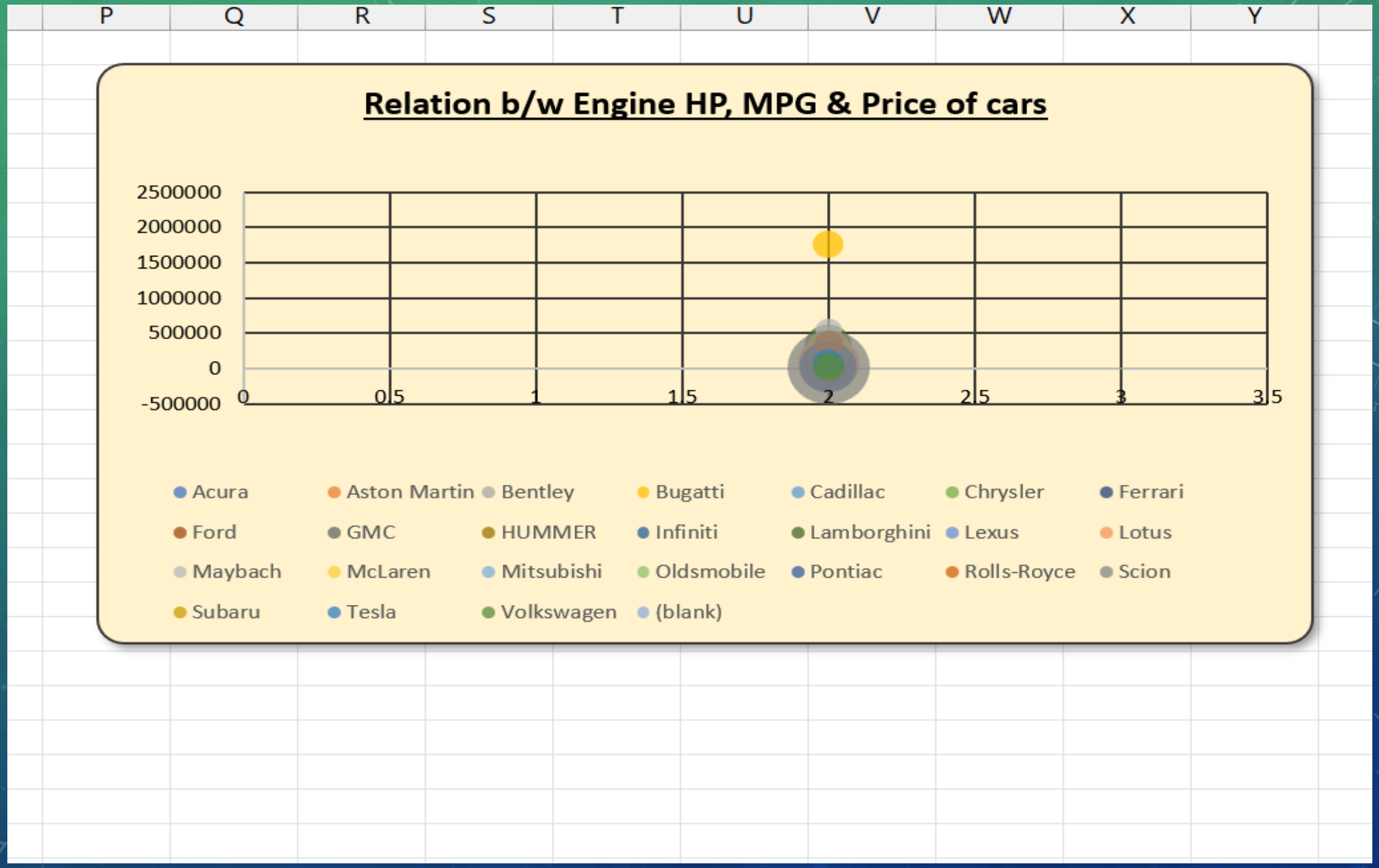
- 2dr Hatchback
- 2dr SUV
- 4dr Hatchback
- 4dr SUV
- Cargo Minivan
- Cargo Van
- Convertible
- Convertible SUV

Year

- 1990
- 1991
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997

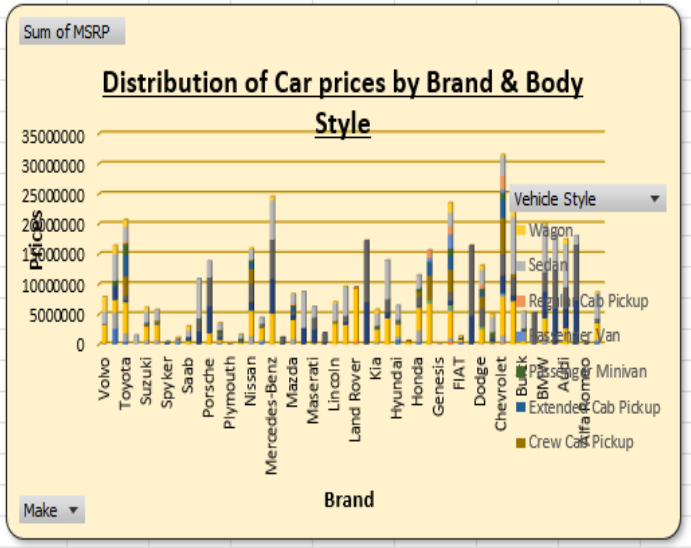
BUILDING DASHBOARDS-TASK 5:

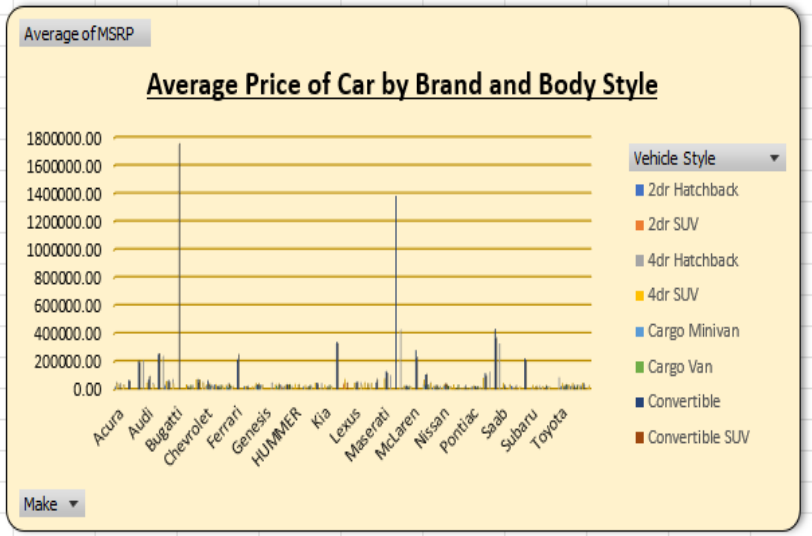
- **Description :** How does the car's horsepower, MPG, and price vary across different Brands?
- To implement this task I've created a Bubble chart to visualize the relationship between horsepower, MPG, and price across different car brands.
- The bubble chart express that cars with high engine hp also have high price and cars with high highway MPG are less in price.
- I've also created a pivot table to calculate the average MPG , MSRP and Engine horsepower for each brand.

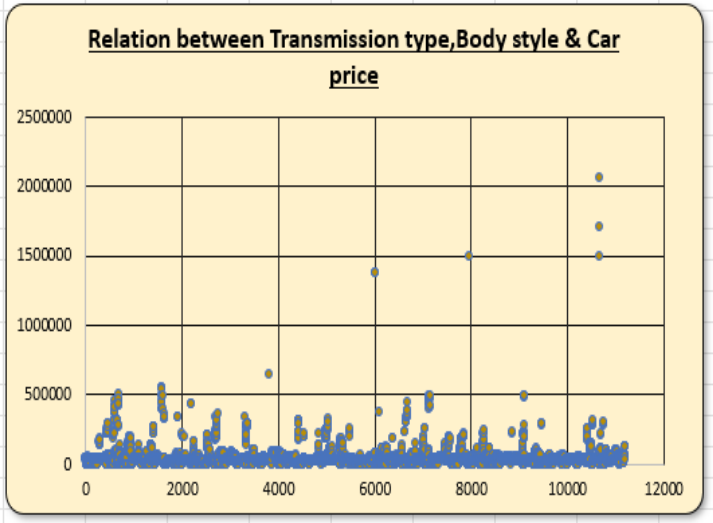

P
Q
R
S
T
U
V
W
X
Y
Relation b/w Engine HP, MPG & Price of cars
2500000
2000000
1500000
1000000
500000
0
-500000
0
0.5
1
1.5
2
2.5
3
3.5
Acura
Aston Martin
Bentley
Bugatti
Cadillac
Chrysler
Ferrari
Ford
GMC
HUMMER
Infiniti
Lamborghini
Lexus
Lotus
Maybach
McLaren
Mitsubishi
Oldsmobile
Pontiac
Rolls-Royce
Scion
Subaru
Tesla
Volkswagen
(blank)

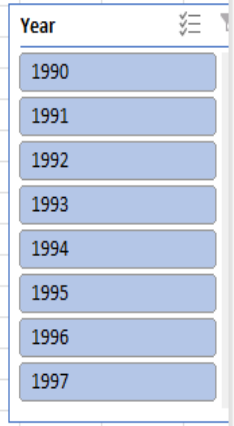
Row Labels	Average of highway MPG	Average of MSRP	Average of Engine HP
Acura	28.22	35087.5	245.0
Alfa Romeo	34.00	61600.0	237.0
Aston Martin	18.93	198123.5	483.8
Audi	28.93	54574.1	280.0
Bentley	18.91	247169.3	533.9
BMW	29.13	62162.6	329.6
Bugatti	14.00	1757223.7	1001.0
Buick	27.01	29034.2	220.0
Cadillac	25.24	56368.3	332.8
Chevrolet	25.93	29074.7	249.5
Chrysler	26.37	26723.0	229.1
Dodge	22.99	24857.0	254.4
Ferrari	15.72	238218.8	512.0
FIAT	37.34	22670.2	143.6
Ford	23.89	28511.3	249.7
Genesis	25.33	46616.7	347.3
GMC	21.46	32444.1	267.6
Honda	32.40	26655.1	196.8
HUMMER	17.29	36464.4	261.2
Hyundai	29.77	24926.3	205.2
Infiniti	24.80	42640.3	310.7
Kia	30.69	25513.8	207.6
Lamborghini	18.02	331567.3	614.1
Land Rover	21.98	68067.1	322.5
Lexus	25.88	47549.1	277.4
Lincoln	24.54	43860.8	286.1
Lotus	26.11	68377.1	271.5
Maserati	20.16	113684.5	419.5
Maybach	16.00	546221.9	590.5
Mazda	27.94	20416.6	172.5
McLaren	22.20	239805.0	610.4
Mercedes-Benz	24.57	72069.5	353.5
Mitsubishi	27.64	21340.6	173.3
Nissan	27.77	28921.2	241.4
Oldsmobile	26.19	12843.8	179.7
Plymouth	27.41	3296.9	133.7
Pontiac	26.96	19800.0	192.3

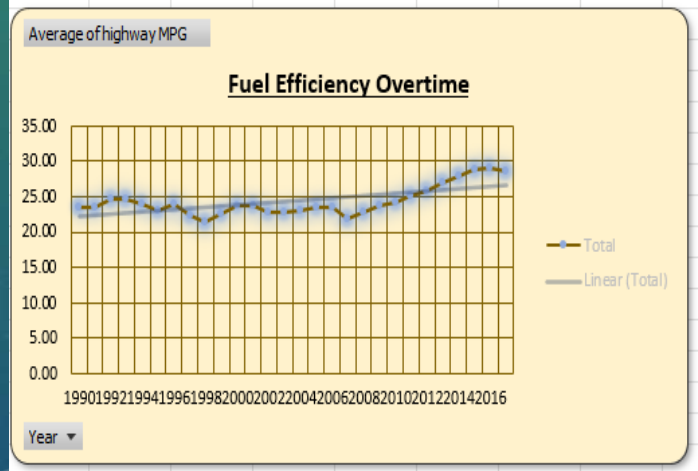
DASHBOARD FOR CAR DETAILS

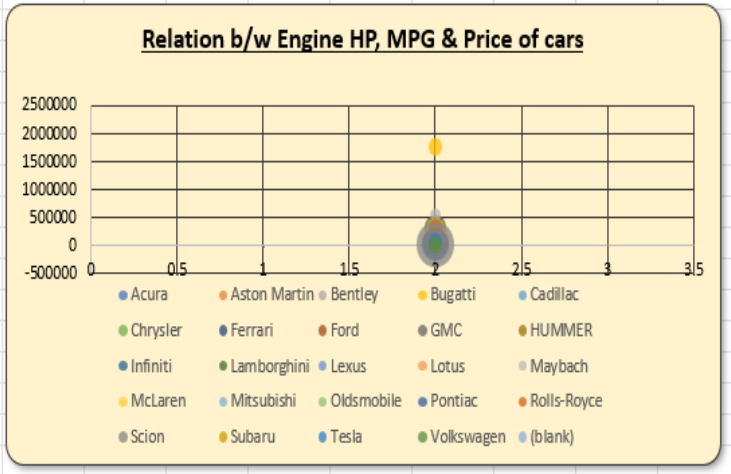


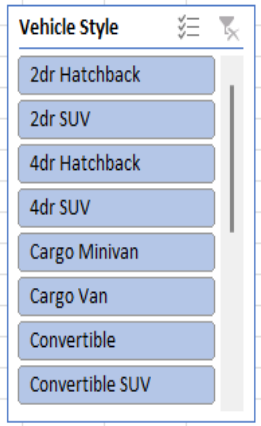


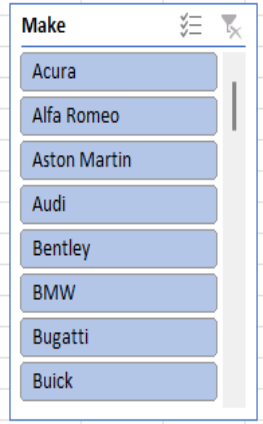


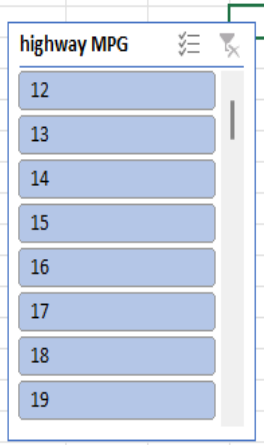












RESULT:

- The coupe body style has the highest MSRP contribution.
- A single car with both automated and manual gear systems will be more advantageous than one gear system, hence the gearbox type automated manual has a significant impact.
- To enable the bulk of the class to afford a car, companies must create cars with high or at least good fuel efficiency .
- Overall, elements of the Coupe body shape and fuel efficiency have a significant impact on the cost and profitability of the car

THANKYOU

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