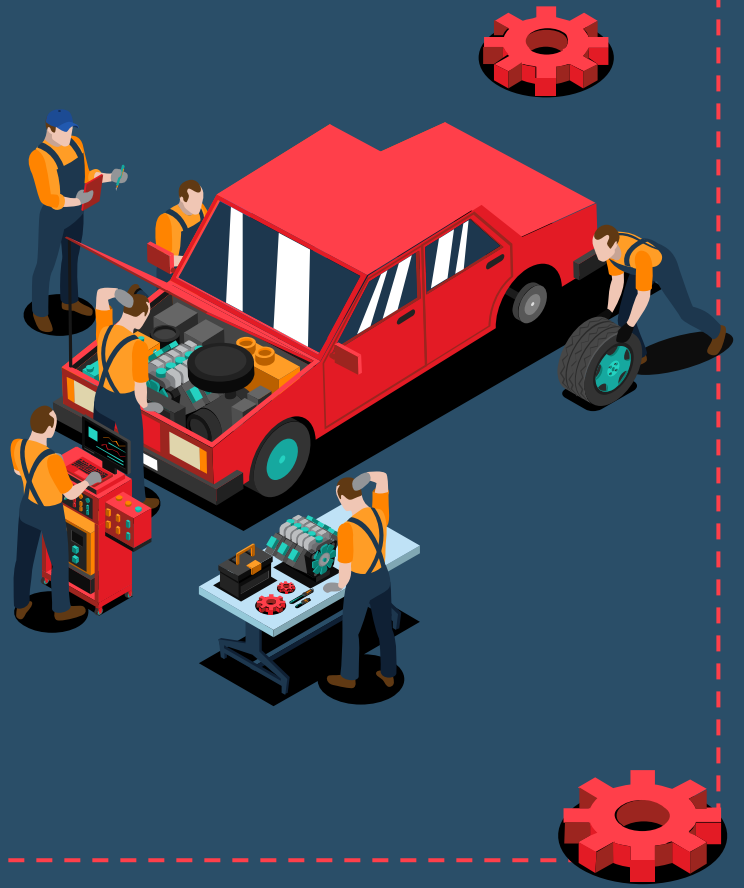
trainity

Analysing the Impact of Car Features on Price and Profitability



Made by- Anurag John Phillips

Project Description

The car industry is ever evolving, with a focus on things like saving fuel and using new technology. Companies that make cars are competing a lot, and people's choices about cars are also changing. Some cars use electricity, and others use gasoline.

The question for us as a Data Analyst is: How can car companies decide the price of cars and make them in a way that people like and they also make money? This means looking at things like what makes a car special, what kind of people want it, and how much it costs.

By analysing data, to look at patterns and groups, car companies can figure out what to do. This helps them make good choices about prices and what to make in the future, so they can do well in the market and make more money over time.

Approach

01

Understanding the Dataset

02

Cleaning Dataset

03

Imputing Data

04

Analyzing and Visualizing Dataset

05

Creating Dashboard

06

Gathering Insights

Tech-Stack Used

Microsoft Excel for Mac Version 16.74

WORKING FILE

https://drive.google.com/drive/folders/1VaLyJnATf4JZcgyvurSXTGmvehlatmdl?usp=sharing

Understanding and Cleaning the Dataset

Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
BMW	1 Series M	2011	premium unleaded (required)	335	6	MANUAL	rear wheel drive	2	Factory Tuner,Luxury,High-Performanc	Compact	Coupe	26	19	3916	46135
BMW	1 Series	2011	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	40650
BMW	1 Series	2011	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,High-Performance	Compact	Coupe	28	20	3916	36350
BMW	1 Series	2011	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	29450
BMW	1 Series	2011	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	18	3916	34500
BMW	1 Series	2012	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	31200
BMW	1 Series	2012	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	26	17	3916	44100
BMW	1 Series	2012	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,High-Performance	Compact	Coupe	28	20	3916	39300
BMW	1 Series	2012	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	18	3916	36900
BMW	1 Series	2013	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	27	18	3916	37200
BMW	1 Series	2013	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,High-Performance	Compact	Coupe	28	20	3916	39600
BMW	1 Series	2013	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	19	3916	31500
BMW	1 Series	2013	premium unleaded (required)	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	44400
BMW	1 Series	2013	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	19	3916	37200
BMW	1 Series	2013	premium unleaded (required)	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	19	3916	31500
BMW	1 Series	2013	premium unleaded (required)	320	6	MANUAL	rear wheel drive	2	Luxury,High-Performance	Compact	Convertible	25	18	3916	48250
BMW	1 Series	2013	premium unleaded (required)	320	6	MANUAL	rear wheel drive	2	Luxury,High-Performance	Compact	Coupe	28	20	3916	43550
Audi	100	1992	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
Audi	100	1992	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
Audi	100	1992	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	20	16	3105	2000
Audi	100	1992	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
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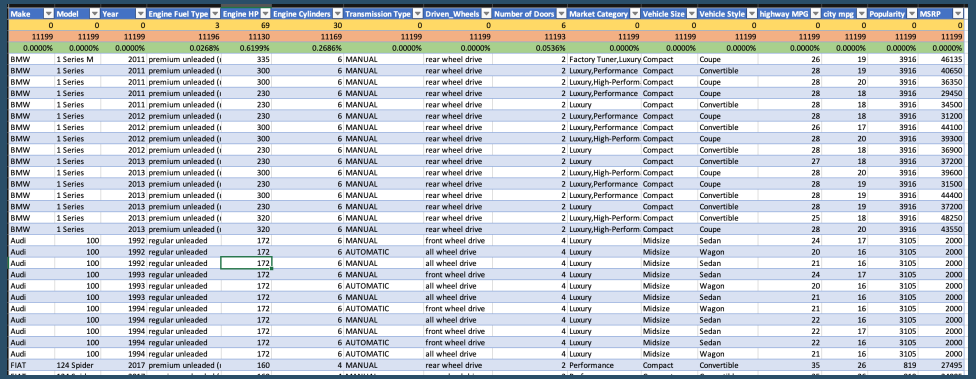
FIAT	124 Spider	2017	premium unleaded (recommendec	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	27495
FIAT	124 Spider	2017	premium unleaded (recommendec	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	24995
FIAT	124 Spider	2017	premium unleaded (recommendec	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	28195
Mercedes-Benz	190-Class	1991	regular unleaded	130	4	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	26	18	617	2000
Mercedes-Benz	190-Class	1991	regular unleaded	158	6	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	25	17	617	2000
Mercedes-Benz	190-Class	1992	regular unleaded	158	6	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	25	17	617	2000

Before Cleaning: 16 – Columns, and 11915 – Rows

Made this into a Table and Removed Duplicates - 715 Rows

Calculated Percentage of Missing Values in each Column



Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
0	0	0	3	69	30	0	0	6	0	0	0	0	0	0	0
11199	11199	11199	11196	11130	11169	11199	11199	11193	11199	11199	11199	11199	11199	11199	11199
0.0000%	0.0000%	0.0000%	0.0268%	0.6199%	0.2686%	0.0000%	0.0000%	0.0536%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
BMW	1 Series M	2011	premium unleaded (	335	6	MANUAL	rear wheel drive	2	Factory Tuner,Luxury	Compact	Coupe	26	19	3916	46135
BMW	1 Series	2011	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	40650
BMW	1 Series	2011	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	36350
BMW	1 Series	2011	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	29450
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BMW	1 Series	2012	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	39300
BMW	1 Series	2012	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	18	3916	36900
BMW	1 Series	2013	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	27	18	3916	37200
BMW	1 Series	2013	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	39600
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BMW	1 Series	2013	premium unleaded (	320	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	43550
Audi	100	1992	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
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FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	27495

Yellow Row- Count of number of missing values

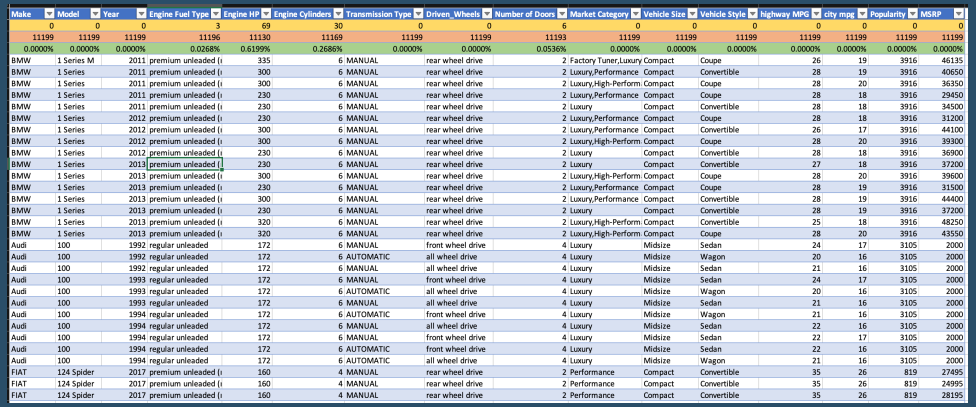
=COUNTBLANK(A5:A11203)

Red Row- Count the number of cells that have value in it

=COUNTA(A5:A11203)

Green Row- Calculated the percentage of missing values

=COUNTBLANK(A:A) / COUNTA(A:A) *100



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11199	11199	11199	11196	11130	11169	11199	11199	11193	11199	11199	11199	11199	11199	11199	11199
0.0000%	0.0000%	0.0000%	0.0268%	0.6199%	0.2686%	0.0000%	0.0000%	0.0536%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
BMW	1 Series M	2011	premium unleaded (	335	6	MANUAL	rear wheel drive	2	Factory Tuner,Luxury	Compact	Coupe	26	19	3916	46135
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BMW	1 Series	2011	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	18	3916	34500
BMW	1 Series	2012	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	31200
BMW	1 Series	2012	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	26	17	3916	44100
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BMW	1 Series	2013	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	44400
BMW	1 Series	2013	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	19	3916	37200
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BMW	1 Series	2013	premium unleaded (	320	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	43550
Audi	100	1992	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
Audi	100	1992	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	20	16	3105	2000
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Audi	100	1993	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	20	16	3105	2000
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Audi	100	1994	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	21	16	3105	2000
FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	27495
FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	24995
FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	28195

Corrected the format of Model Column to Text

Before Imputation

Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
0	0	0	3	69	30	0	0	6	0	0	0	0	0	0	0
11199	11199	11199	11196	11130	11169	11199	11199	11193	11199	11199	11199	11199	11199	11199	11199
0.0000%	0.0000%	0.0000%	0.0268%	0.6199%	0.2686%	0.0000%	0.0000%	0.0536%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
BMW	1 Series M	2011	premium unleaded (r	335	6	MANUAL	rear wheel drive	2	Factory Tuner,Luxury	Compact	Coupe	26	19	3916	46135
BMW	1 Series	2011	premium unleaded (r	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	40650
BMW	1 Series	2011	premium unleaded (r	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	36350
BMW	1 Series	2011	premium unleaded (r	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	29450
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BMW	1 Series	2012	premium unleaded (r	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	31200
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FIAT	124 Spider	2017	premium unleaded (r	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	28195

Imputation Method Used- Either looking at the Missing Data from the Table Itself or Online

Working Datasheet

Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
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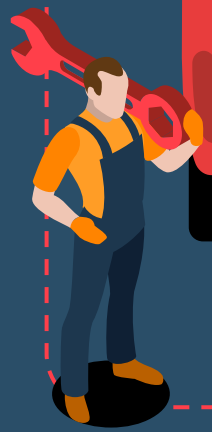
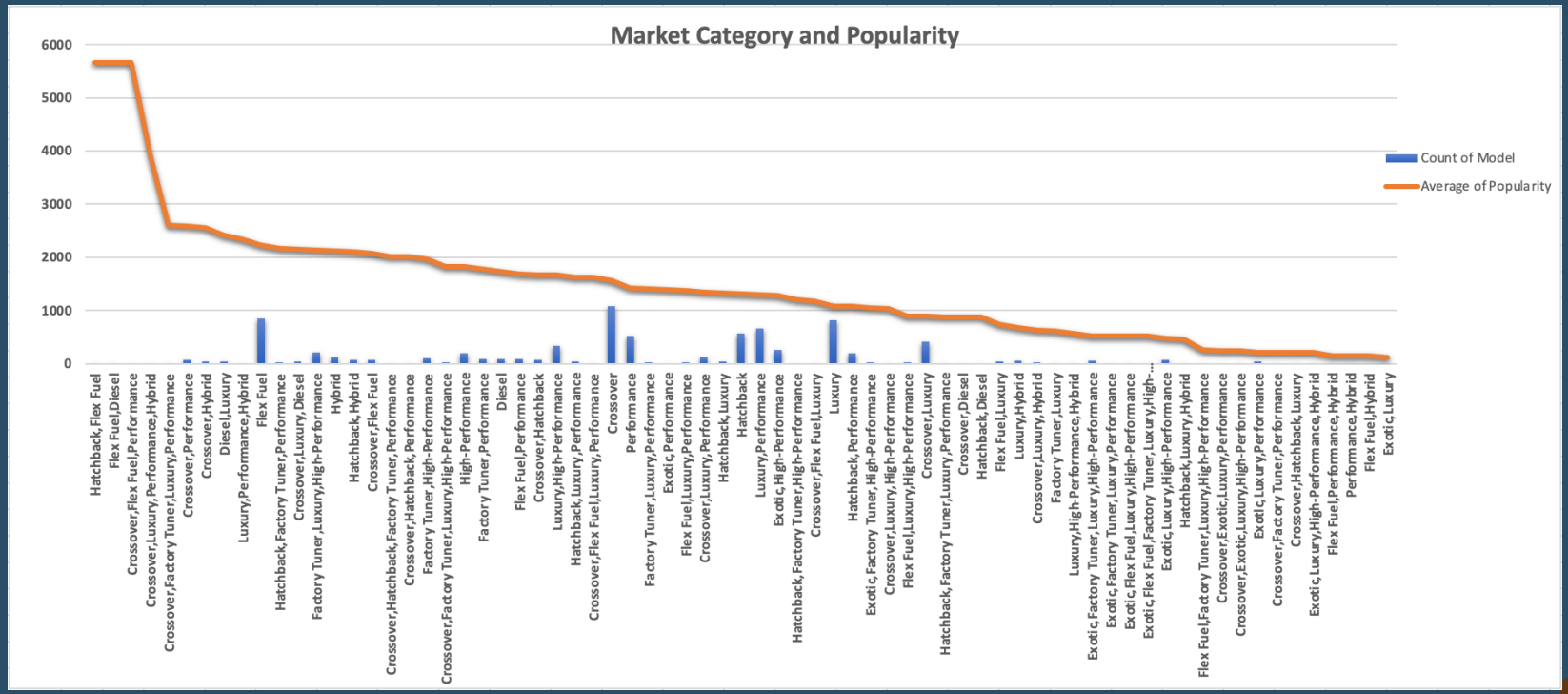
BMW	1 Series	2011	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	40650
BMW	1 Series	2011	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	36350
BMW	1 Series	2011	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	29450
BMW	1 Series	2011	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	18	3916	34500
BMW	1 Series	2012	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	18	3916	31200
BMW	1 Series	2012	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	26	17	3916	44100
BMW	1 Series	2012	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	39300
BMW	1 Series	2012	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	18	3916	36900
BMW	1 Series	2013	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	27	18	3916	37200
BMW	1 Series	2013	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	39600
BMW	1 Series	2013	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Coupe	28	19	3916	31500
BMW	1 Series	2013	premium unleaded (	300	6	MANUAL	rear wheel drive	2	Luxury,Performance	Compact	Convertible	28	19	3916	44400
BMW	1 Series	2013	premium unleaded (	230	6	MANUAL	rear wheel drive	2	Luxury	Compact	Convertible	28	19	3916	37200
BMW	1 Series	2013	premium unleaded (	320	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Convertible	25	18	3916	48250
BMW	1 Series	2013	premium unleaded (	320	6	MANUAL	rear wheel drive	2	Luxury,High-Perform	Compact	Coupe	28	20	3916	43550
Audi	100	1992	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
Audi	100	1992	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	20	16	3105	2000
Audi	100	1992	regular unleaded	172	6	MANUAL	all wheel drive	4	Luxury	Midsize	Sedan	21	16	3105	2000
Audi	100	1993	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	24	17	3105	2000
Audi	100	1993	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	20	16	3105	2000
Audi	100	1993	regular unleaded	172	6	MANUAL	all wheel drive	4	Luxury	Midsize	Sedan	21	16	3105	2000
Audi	100	1994	regular unleaded	172	6	AUTOMATIC	front wheel drive	4	Luxury	Midsize	Wagon	21	16	3105	2000
Audi	100	1994	regular unleaded	172	6	MANUAL	all wheel drive	4	Luxury	Midsize	Sedan	22	16	3105	2000
Audi	100	1994	regular unleaded	172	6	MANUAL	front wheel drive	4	Luxury	Midsize	Sedan	22	17	3105	2000
Audi	100	1994	regular unleaded	172	6	AUTOMATIC	front wheel drive	4	Luxury	Midsize	Sedan	22	16	3105	2000
Audi	100	1994	regular unleaded	172	6	AUTOMATIC	all wheel drive	4	Luxury	Midsize	Wagon	21	16	3105	2000
FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	27495
FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	24995
FIAT	124 Spider	2017	premium unleaded (	160	4	MANUAL	rear wheel drive	2	Performance	Compact	Convertible	35	26	819	28195
Mercedes-Be	190-Class	1991	regular unleaded	130	4	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	26	18	617	2000
Mercedes-Be	190-Class	1991	regular unleaded	158	6	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	25	17	617	2000
Mercedes-Be	190-Class	1992	regular unleaded	158	6	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	25	17	617	2000
Mercedes-Be	190-Class	1992	regular unleaded	130	4	MANUAL	rear wheel drive	4	Luxury	Compact	Sedan	26	18	617	2000

After Cleaning: 16 - Columns and 11200 – Rows

01

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



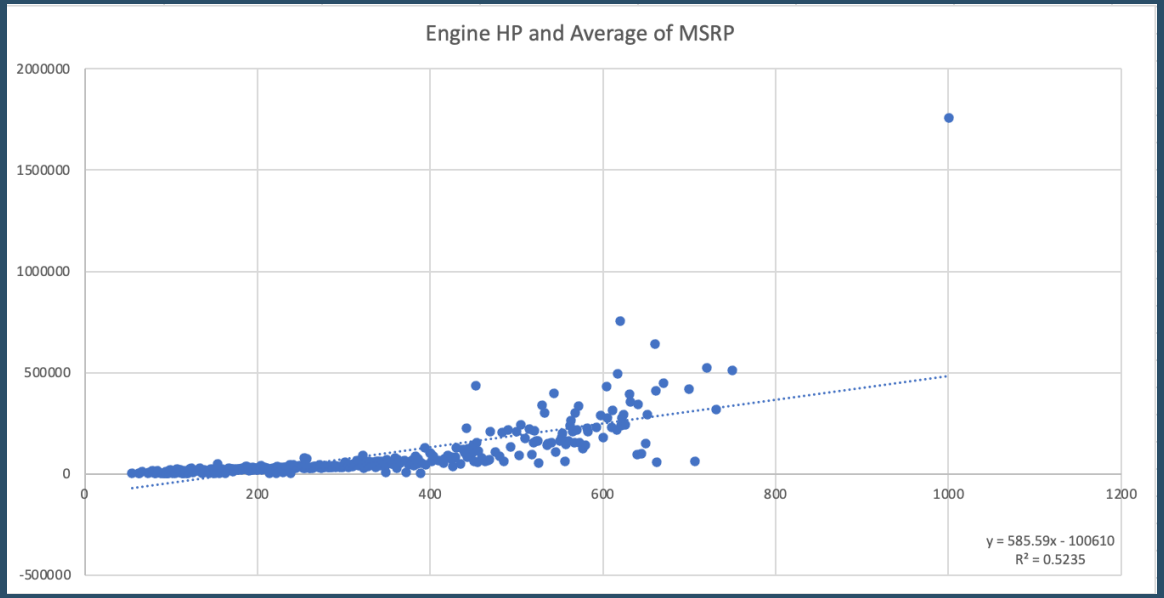


Hatchback, Flex Fuel and Diesel have the highest Popularity, whereas Exotic has the least Popularity

Crossover, Flex Fuel and Luxury are the most sold cars

02

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



The positive coefficient for Engine HP (585.59) suggests that, on average, as the Engine HP of a car increases, the Price tends to increase as well. This aligns with the common expectation that more powerful engines are often associated with higher-priced vehicles.

The R^2 value indicates that 52.35% of the variability in Price can be explained by Engine HP according to this linear model. This suggests that while Engine HP is a significant factor in determining Price, there are other factors that contribute to the variability in Price.

03

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

Make	Make2	Year	Engine Fuel Type	Engine Fuel Type2	Engine HP	Engine Cylinders	Transmission Type	Transmission Type2	Driven_Wheels	Driven_Wheels2
BMW	6	2011	premium unleaded (r	9	335	6	MANUAL	4	rear wheel drive	4
BMW	6	2011	premium unleaded (r	9	300	6	MANUAL	4	rear wheel drive	4
BMW	6	2011	premium unleaded (r	9	300	6	MANUAL	4	rear wheel drive	4
BMW	6	2011	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2011	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2012	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2012	premium unleaded (r	9	300	6	MANUAL	4	rear wheel drive	4
BMW	6	2012	premium unleaded (r	9	300	6	MANUAL	4	rear wheel drive	4
BMW	6	2012	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	300	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	300	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	230	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	320	6	MANUAL	4	rear wheel drive	4
BMW	6	2013	premium unleaded (r	9	320	6	MANUAL	4	rear wheel drive	4
Audi	4	1992	regular unleaded	10	172	6	MANUAL	4	front wheel drive	3
Audi	4	1992	regular unleaded	10	172	6	AUTOMATIC	2	all wheel drive	1
Audi	4	1992	regular unleaded	10	172	6	MANUAL	4	all wheel drive	1
Audi	4	1993	regular unleaded	10	172	6	MANUAL	4	front wheel drive	3
Audi	4	1993	regular unleaded	10	172	6	AUTOMATIC	2	all wheel drive	1
Audi	4	1993	regular unleaded	10	172	6	MANUAL	4	all wheel drive	1
Audi	4	1994	regular unleaded	10	172	6	AUTOMATIC	2	front wheel drive	3
Audi	4	1994	regular unleaded	10	172	6	MANUAL	4	all wheel drive	1
Audi	4	1994	regular unleaded	10	172	6	MANUAL	4	front wheel drive	3
Audi	4	1994	regular unleaded	10	172	6	AUTOMATIC	2	front wheel drive	3
Audi	4	1994	regular unleaded	10	172	6	AUTOMATIC	2	all wheel drive	1
FIAT	14	2017	premium unleaded (r	8	160	4	MANUAL	4	rear wheel drive	4
FIAT	14	2017	premium unleaded (r	8	160	4	MANUAL	4	rear wheel drive	4
FIAT	14	2017	premium unleaded (r	8	160	4	MANUAL	4	rear wheel drive	4
Mercedes-Be	32	1991	regular unleaded	10	130	4	MANUAL	4	rear wheel drive	4
Mercedes-Be	32	1991	regular unleaded	10	158	6	MANUAL	4	rear wheel drive	4
Mercedes-Be	32	1992	regular unleaded	10	158	6	MANUAL	4	rear wheel drive	4
Mercedes-Be	32	1992	regular unleaded	10	130	4	MANUAL	4	rear wheel drive	4
Mercedes-Be	32	1993	regular unleaded	10	130	4	MANUAL	4	rear wheel drive	4
Mercedes-Be	32	1993	regular unleaded	10	158	6	MANUAL	4	rear wheel drive	4
BMW	6	2016	premium unleaded (r	9	240	4	AUTOMATIC	2	rear wheel drive	4
BMW	6	2016	premium unleaded (r	9	240	4	AUTOMATIC	2	rear wheel drive	4
BMW	6	2016	premium unleaded (r	9	320	6	AUTOMATIC	2	rear wheel drive	4
BMW	6	2016	premium unleaded (r	9	240	4	AUTOMATIC	2	all wheel drive	1
BMW	6	2016	premium unleaded (r	9	240	4	AUTOMATIC	2	all wheel drive	1
BMW	6	2016	premium unleaded (r	9	320	6	AUTOMATIC	2	rear wheel drive	4
BMW	6	2016	premium unleaded (r	9	240	4	MANUAL	4	rear wheel drive	4
BMW	6	2016	premium unleaded (r	9	320	6	AUTOMATIC	2	all wheel drive	1
BMW	6	2016	premium unleaded (r	9	320	6	AUTOMATIC	2	rear wheel drive	4
BMW	6	2017	premium unleaded (r	8	335	6	AUTOMATIC	2	all wheel drive	1
BMW	6	2017	premium unleaded (r	8	335	6	AUTOMATIC	2	rear wheel drive	4
BMW	6	2017	premium unleaded (r	8	335	6	AUTOMATIC	2	all wheel drive	1
BMW	6	2017	premium unleaded (r	8	335	6	AUTOMATIC	2	rear wheel drive	4
BMW	6	2017	premium unleaded (r	8	248	4	AUTOMATIC	2	rear wheel drive	4
BMW	6	2017	premium unleaded (r	8	248	4	AUTOMATIC	2	rear wheel drive	4
BMW	6	2017	premium unleaded (r	8	248	4	AUTOMATIC	2	all wheel drive	1

Make	Number
Acura	1
Alfa Romeo	2
Aston Martin	3
Audi	4
Bentley	5
BMW	6
Bugatti	7
Buick	8
Cadillac	9
Chevrolet	10
Chrysler	11
Dodge	12
Ferrari	13
FIAT	14
Ford	15
Genesis	16
GMC	17
Honda	18
HUMMER	19
Hyundai	20
Infiniti	21
Kia	22
Lamborghini	23
Land Rover	24
Lexus	25
Lincoln	26
Lotus	27
Maserati	28
Maybach	29
Mazda	30
McLaren	31
Mercedes-Benz	32
Mitsubishi	33
Nissan	34
Oldsmobile	35
Plymouth	36
Pontiac	37
Porsche	38
Rolls-Royce	39
Saab	40
Scion	41
Spyker	42
Subaru	43
Suzuki	44
Tesla	45
Toyota	46
Volkswagen	47
Volvo	48

Engine Fuel Type	Number
diesel	1
electric	2
flex-fuel (premium unleaded recommended/E85)	3
flex-fuel (premium unleaded required/E85)	4
flex-fuel (unleaded/E85)	5
flex-fuel (unleaded/natural gas)	6
natural gas	7
premium unleaded (recommended)	8
premium unleaded (required)	9
regular unleaded	10

Transmission Type	Number
AUTOMATED_MANUAL	1
AUTOMATIC	2
DIRECT_DRIVE	3
MANUAL	4
UNKNOWN	5

Vehicle Size	Number
Compact	1
Large	3
Midsize	2

Vehicle Style	Number
2dr Hatchback	1
2dr SUV	2
4dr Hatchback	3
4dr SUV	4
Cargo Minivan	5
Cargo Van	6
Convertible	7
Convertible SUV	8
Coupe	9
Crew Cab Pickup	10
Extended Cab Pickup	11
Passenger Minivan	12
Passenger Van	13
Regular Cab Pickup	14
Sedan	15
Wagon	16

Driven_Wheels	Number
all wheel drive	1
four wheel drive	2
front wheel drive	3
rear wheel drive	4

Here I transformed Ordinal Variable to Numeric to facilitate Regression Analysis as it requires numeric data.

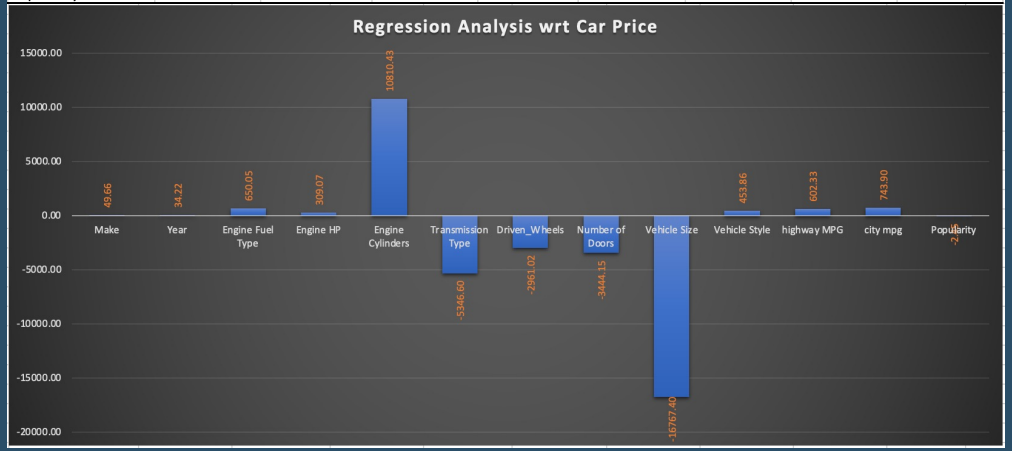
SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.70612959
R Square	0.498618998
Adjusted R Square	0.498036257
Standard Error	43597.21193
Observations	11199

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	13	2.11424E+13	1.62634E+12	855.6449351	0
Residual	11185	2.12595E+13	1900716888		
Total	11198	4.24019E+13			

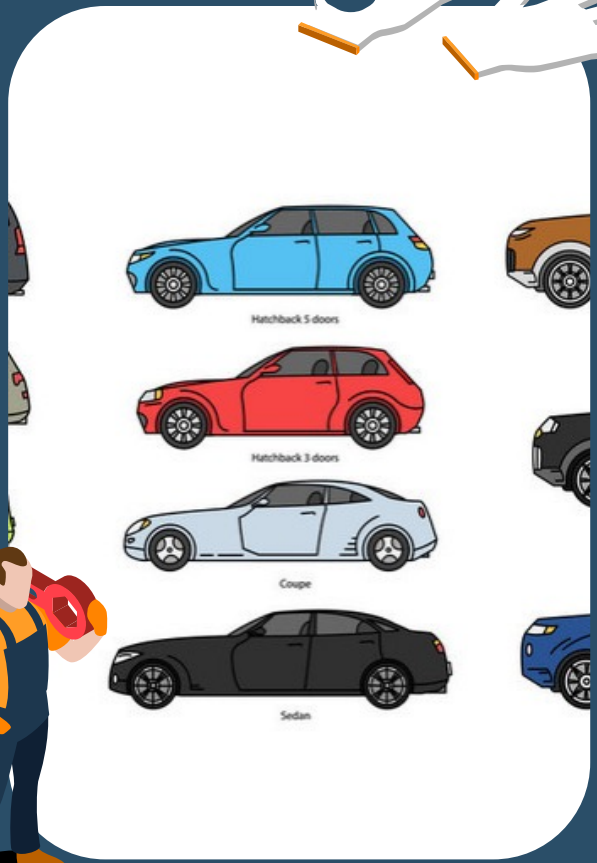
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-140419.5963	159545.4034	-0.880123108	0.378811532	-453156.6831	172317.4906	-453156.6831	172317.4906
Make	49.66	31.39747295	1.581746199	0.113735796	-11.88174262	111.2074096	-11.88174262	111.2074096
Year	34.22	79.43379915	0.430843768	0.666590275	-121.4806774	189.927792	-121.4806774	189.927792
Engine Fuel Type	650.05	246.6497951	2.635530484	0.008412178	166.5760202	1133.530088	166.5760202	1133.530088
Engine HP	309.07	7.501018672	41.20393614	0	294.3681768	323.7748119	294.3681768	323.7748119
Engine Cylinders	10810.43	494.2008756	21.87455703	6.7165E-104	9841.704493	11779.14598	9841.704493	11779.14598
Transmission Type	-5346.60	526.9324627	-10.14665155	4.35961E-24	-6379.48051	-4313.719669	-6379.48051	-4313.719669
Driven_Wheels	-2961.02	408.0962528	-7.255697525	4.26042E-13	-3760.963493	-2161.08245	-3760.963493	-2161.08245
Number of Doors	-3444.15	580.511382	-5.932956428	3.0634E-09	-4582.053272	-2306.244198	-4582.053272	-2306.244198
Vehicle Size	-16767.40	681.7314779	-24.59531656	3.9094E-130	-18103.71526	-15431.08776	-18103.71526	-15431.08776
Vehicle Style	453.86	91.66021566	4.951601323	7.468E-07	274.1946809	633.5350092	274.1946809	633.5350092
highway MPG	602.33	107.1698245	5.62030892	1.95179E-08	392.2557918	812.3992491	392.2557918	812.3992491
city mpg	743.90	100.3999528	7.409364172	1.3605E-13	547.0982252	940.7014014	547.0982252	940.7014014
Popularity	-2.45	0.302795696	-8.096028558	6.26637E-16	-3.044975488	-1.857909715	-3.044975488	-1.857909715



Regression Analysis which is inside Data Analysis under Data Tab

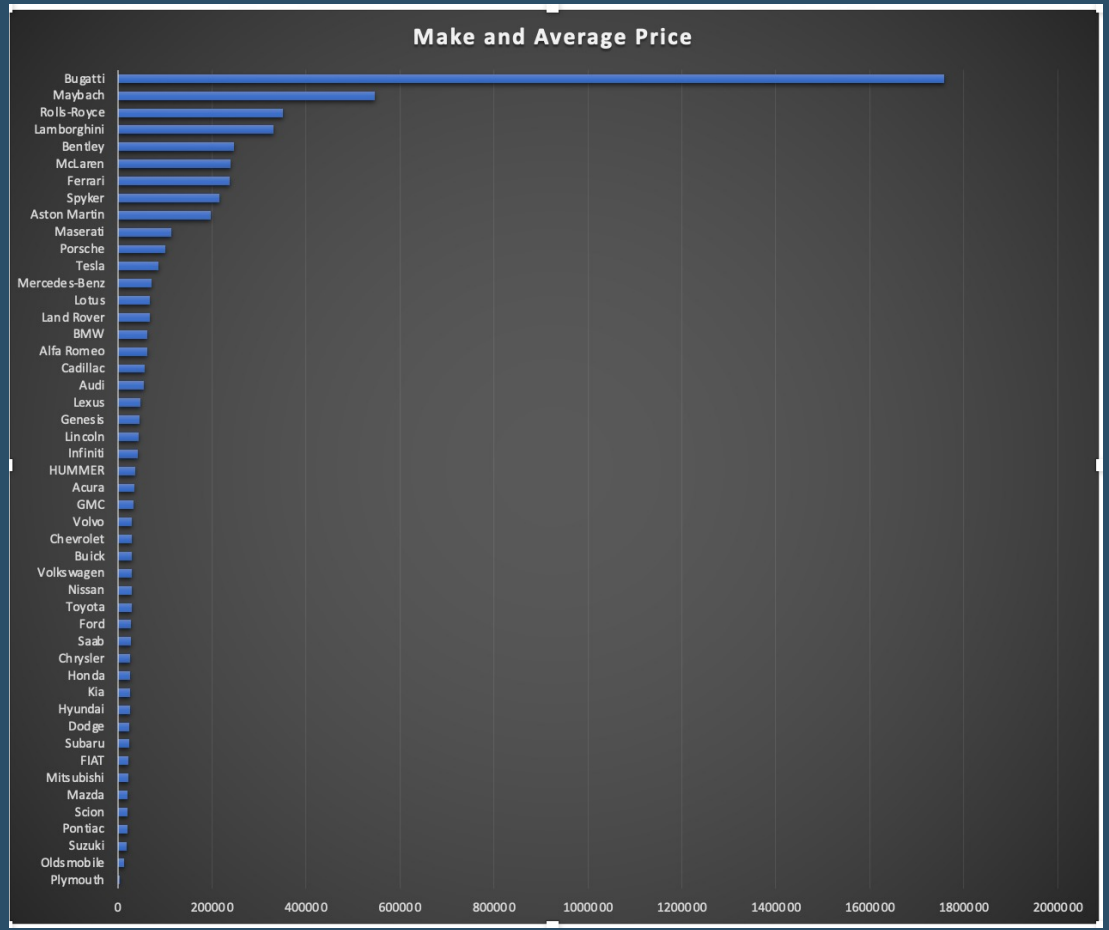
Y axis- Price
X axis- I choose all the related columns

Engine Cylinders, City MPG, Highway MPG and Engine Fuel Type have the highest positive coefficients w.r.t Car Price. This means that these variables are most important in determining a car's price.



04

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



We can observe that there's a wide range of average prices across different makes, with some makes having relatively lower average prices (e.g., Plymouth, Suzuki) and others having significantly higher average prices (e.g., Bugatti, Maybach).

Luxury vs. Non-Luxury: There seems to be a clear distinction between luxury and non-luxury car makes in terms of average MSRP. Brands like Bugatti, Maybach, Rolls-Royce, Bentley, and Lamborghini have extremely high average prices, indicating they are associated with luxury and high-performance vehicles. On the other hand, brands like Plymouth and Suzuki have much lower average prices, suggesting more affordable and non-luxury vehicles.

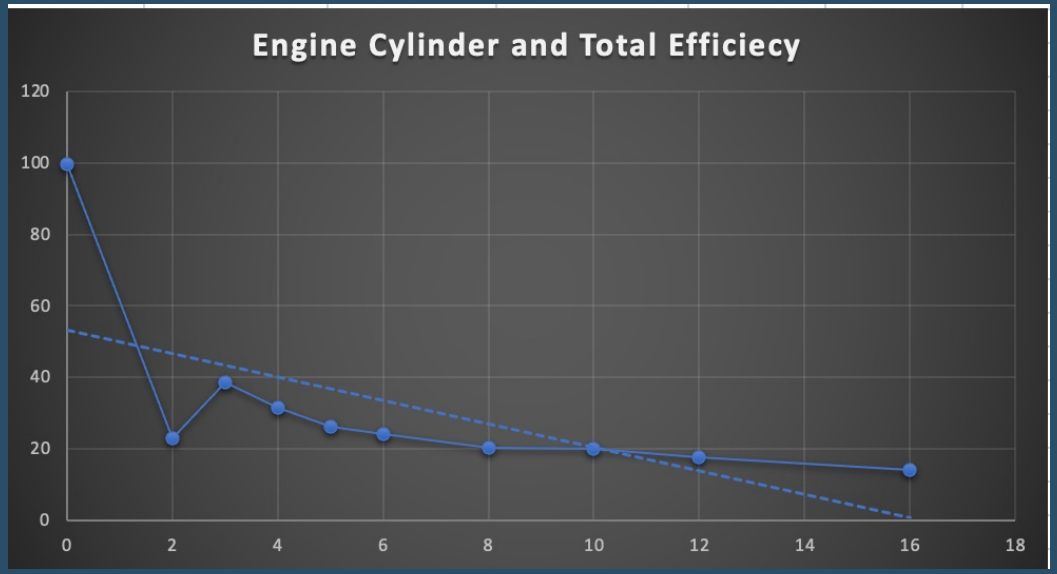
Premium Brands: Brands like BMW, Mercedes-Benz, Tesla, Audi, Lexus, and Porsche have relatively high average MSRP, indicating that they are considered premium brands with higher-priced vehicles compared to non-luxury brands.

Economic and Everyday Brands: Brands like Hyundai, Kia, and Ford have moderate average prices, suggesting they may cater to a more mainstream market with economic and everyday vehicles.

This variability in average prices across different car brands can reflect factors such as brand reputation, target market, vehicle type, performance, features, and luxury status.

05

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



	highway MPG	*Engine Cylinders*
highway MPG	1	
Engine Cylinders	-0.616638877	1

A correlation coefficient of -0.616638877 indicates that as the number of engine cylinders increases, fuel efficiency tends to decrease. The magnitude of the correlation coefficient (-0.617) suggests a moderately strong negative linear relationship between these two variables.

In practical terms, this means that vehicles with more engine cylinders (larger engine sizes) are likely to have lower fuel efficiency. As larger engines with more cylinders often require more fuel to operate, resulting in lower miles per gallon (MPG) or worse fuel efficiency.

Other variables not included in the chart also play a significant role in determining fuel efficiency, such as engine size, technology, vehicle weight, transmission type, and driving conditions.

DASHBOARD

EXCEL FILE

https://docs.google.com/spreadsheets/d/1WIngqMOtFJ1T9tWo-H61uyJ_FZAV4fSD/edit?usp=sharing&ouid=109466755193972209405&rtpof=true&sd=true

DASHBOARD TASKS

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

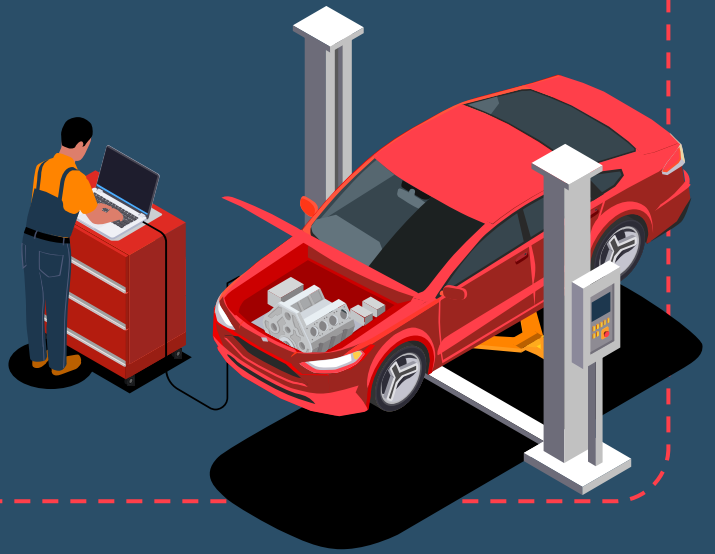
How does the fuel efficiency of cars vary across different body styles and model years?

TASK 5

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

INSIGHTS

- We observed that although Hatchback, Flex Fuel and Diesel have the highest Popularity, but the most sold cars were Crossover, Flex Fuel and Luxury.
- We also observed that Engine HP is a significant factor in determining Price. Higher the Engine HP, Higher the Price of the Car
- Engine Cylinders, City MPG, Highway MPG and Engine Fuel Type are most important in determining a car's price.
- We can divide our list into Luxury, Premium, Economic and Everyday vehicles. This variability in average prices depends on brand reputation, target market, vehicle type, performance, features, and luxury status.
- We also observed that vehicles with more engine cylinders (larger engine sizes) are likely to have lower fuel efficiency. As larger engines with more cylinders often require more fuel to operate, resulting in lower miles per gallon (MPG) or worse fuel efficiency.



MY LEARNINGS

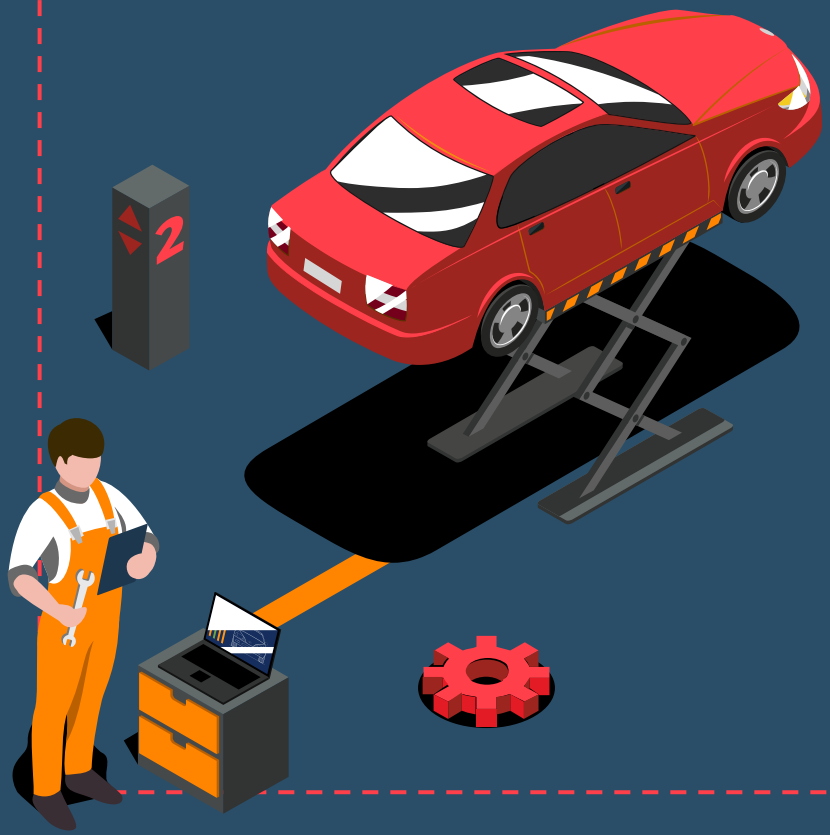
1. This dataset was very interesting to me, as I personally love cars and to analyse this dataset, was something I loved doing.

2. All my analysis was done on Excel and Pivot Table was used in all the task analysis, from making Charts to Dashboard everywhere.

3. The dataset did not have a lot of missing data so instead of removing the missing value rows, I decided to go ahead by imputing values on it.

4. I learned how to make Dashboard in Excel and to do Regression Analysis by transforming Ordinal Variable Columns to Numerical Columns.

5. This project helped me in improving my Excel skills and gaining a better understanding of how to navigate complex datasets.



Thanks!