Cars in the Middle East

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Introduction:

The car market in the Middle East has been a growing market in 2019 and the car market is slowly recovering from the COVID-19 pandemic. To prevent shipping cars to the Middle East that will not be bought, it is important to analyze the current car market there and to only provide vehicles that are affordable. We decided to analyze the cars that are being sold there and find the features of a vehicle that affect the price the most. This will be useful because it can help the customer determine what cars they would want, and it allows the car dealer and makers to create vehicles that would be affordable.

Idea:

With the data provided, we used it to predict what the best vehicle would be for someone based on their needs and wants. We created a polynomial regression model that will use the features that a person wants in a vehicle to predict the price of that vehicle. In order to analyze the data and see how the price is affected by the features, linear models were made for each feature to provide a visual on how the two interact or correlate with each other.

Analysis:

Through the use of these models, potential customers in the Middle East will be able to determine what vehicle would best suit their needs and costs the least. They can determine which car would best suit them based on engine capacity or the size of the cylinders in the motor, amount of cylinders the vehicle has, horsepower, torque, the top speed that it can reach, and the acceleration of the vehicle. Additionally, car dealers and car makers would be able to produce and provide cars that are best suited for customers in the Middle East. The polynomial model that was created has a high prediction rate where it can accurately predict the price of the car that a customer would want with a 87.8% efficiency.

| Feature	Correlation	Coefficients
Engine Capacity	0.485	1789.3
Cylinders	0.605	1169.6
Horsepower	0.576	3306.3
Torque	0.664	1789.3
Top Speed	0.544	645.2
Acceleration	-0.425	-1115.6

From the table above, we can see how each one of the car features correlates with the price of the vehicle. For engine capacity, cylinders, horsepower, torque, and top speed we see that there is a positive moderate correlation between these vehicle features and the price of the vehicle itself. This means that as the price goes up, then the values for these features will also go up. The only time this does not apply is for acceleration, where the price will decrease. The coefficient shows the amount that the price increases or decreases by per each value in the respective vehicle feature.
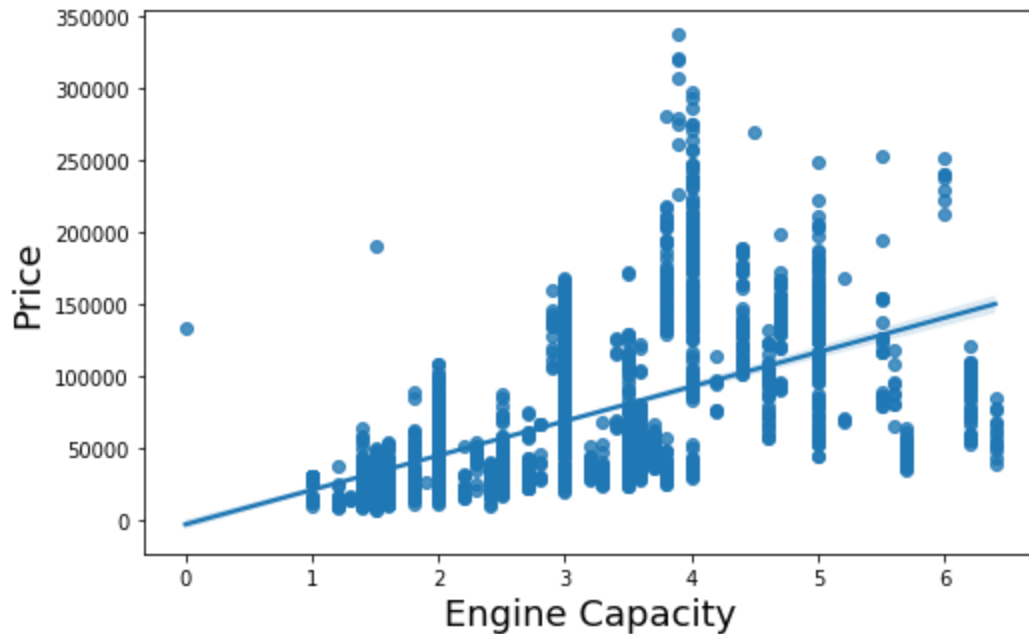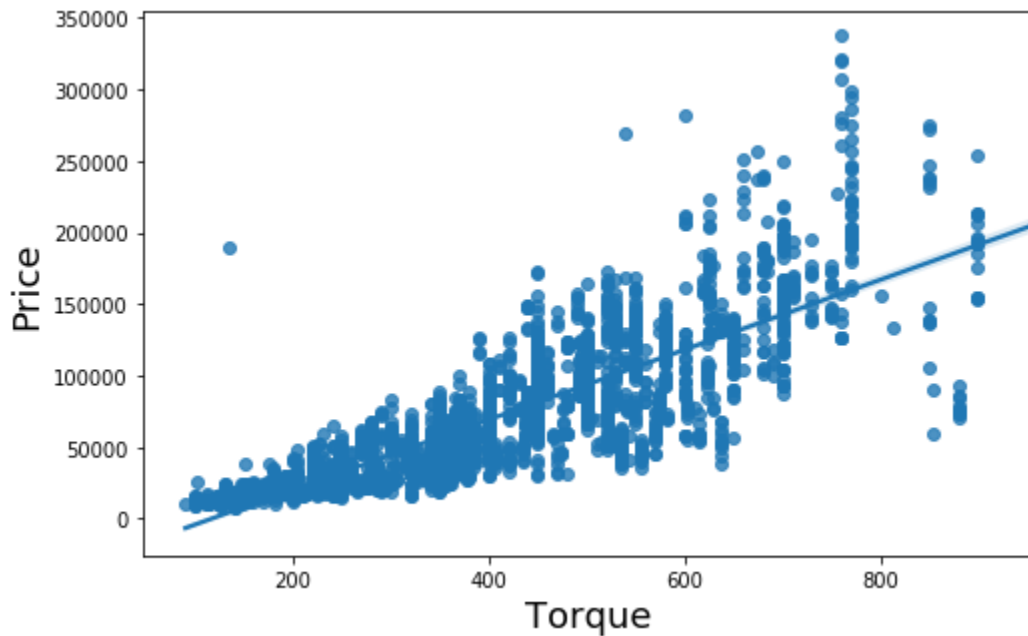
From the graph above, we can see that the engine capacity has a positive relationship with the price of the vehicle. Due to the engine capacity having a moderate correlation with price, there are outliers that do not accurately represent the correct relationship between the two. The average for engine capacity is 3.01 this usually leads to vehicles being priced around 58,000 dollars. The polynomial model has a strong correlation between the actual values and the predicted value.
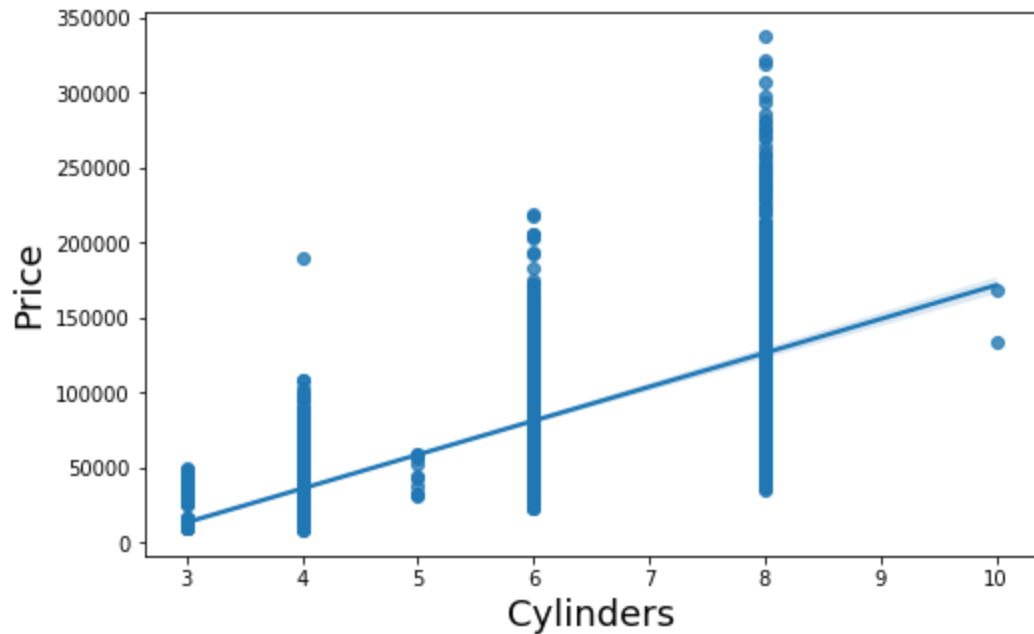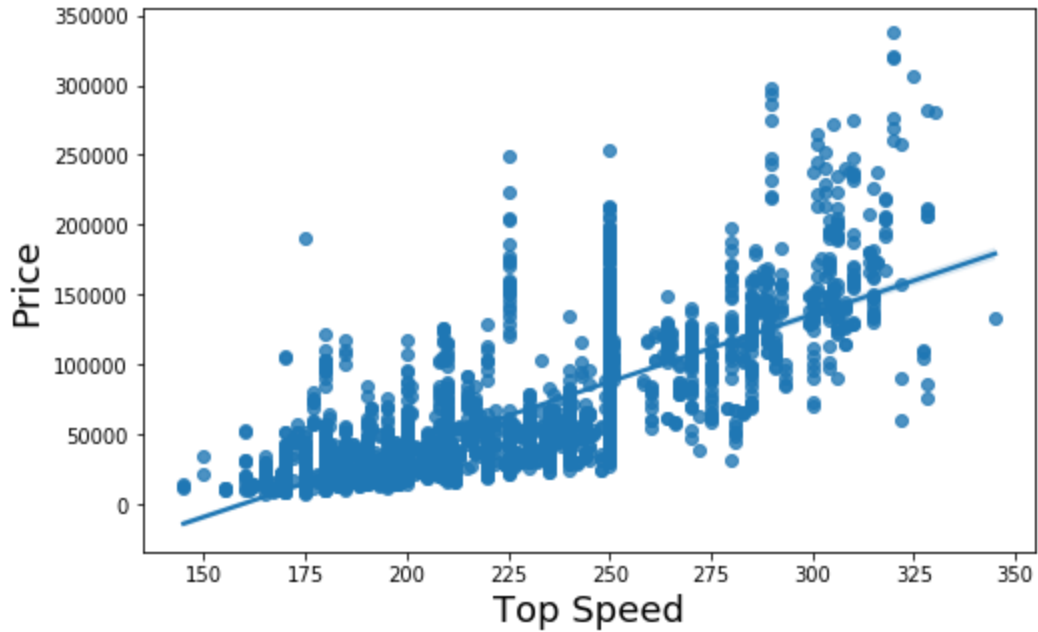
From the graph above, we can see that the cylinders has a positive relationship with the price of the vehicle. Due to the cylinders having a moderate correlation with price, there are outliers that do not accurately represent the correct relationship between the two. The average for cylinders is 5.54, this usually leads to vehicles being priced around 61,000 dollars. The polynomial model has a strong correlation between the actual values and the predicted value.
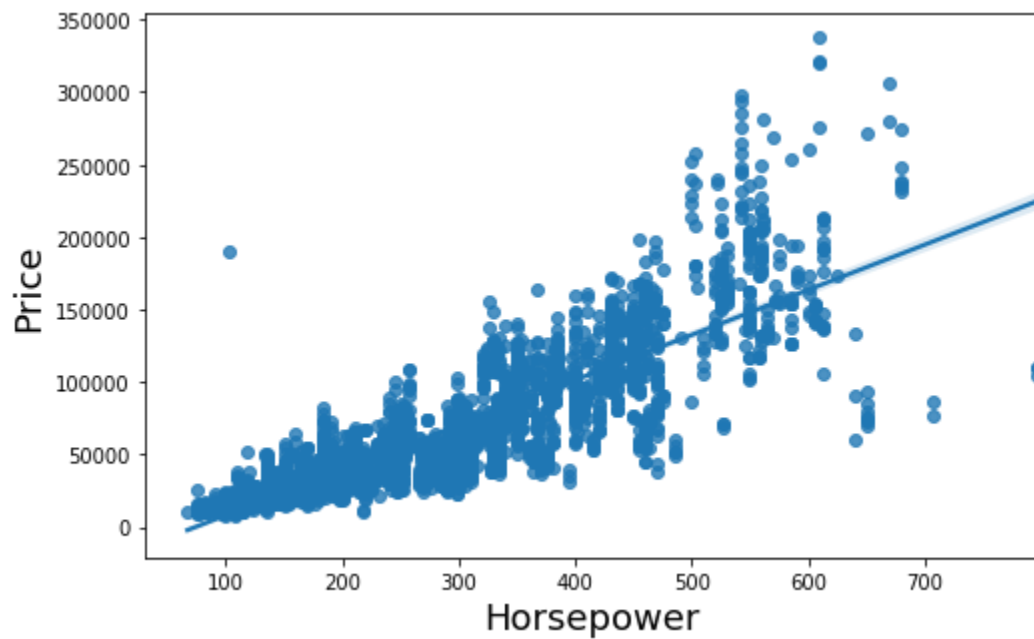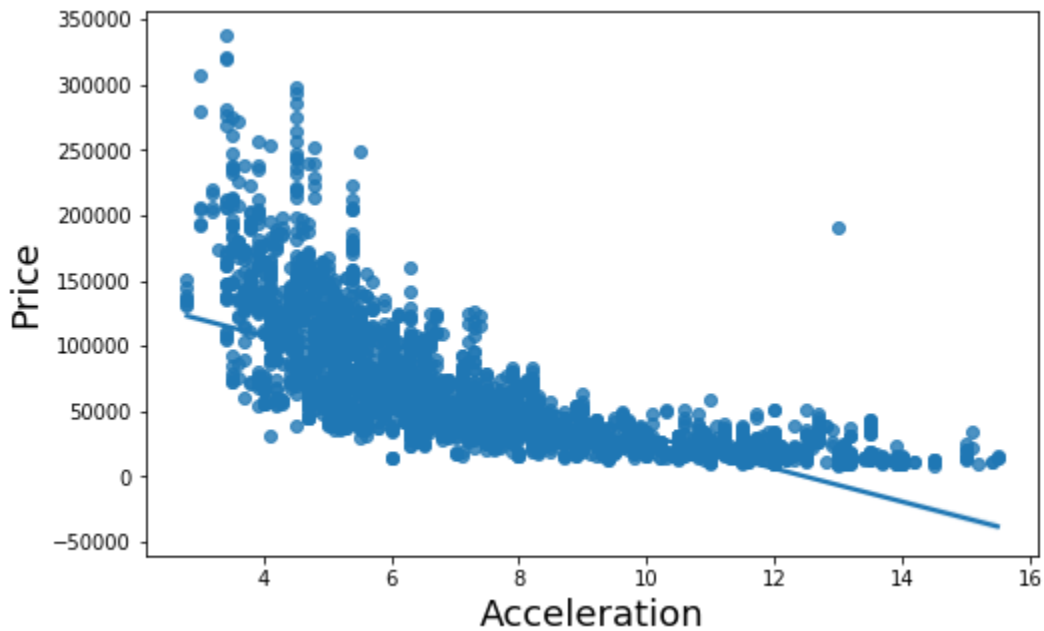
From the graph above, we can see that the horsepower has a positive relationship with the price of the vehicle. Due to the horsepower having a moderate correlation with price, there are outliers that do not accurately represent the correct relationship between the two. The average for horsepower is 295.83, this usually leads to vehicles being priced around 69,000 dollars. The polynomial model has a strong correlation between the actual values and the predicted value.

From the graph above, we can see that the torque has a positive relationship with the price of the vehicle. Due to the torque having a moderate correlation with price, there are outliers that do not accurately represent the correct relationship between the two. The average for torque is 400.98, this usually leads to vehicles being priced around 67,000 dollars. The polynomial model has a strong correlation between the actual values and the predicted value.

From the graph above, we can see that the top speed has a positive relationship with the price of the vehicle. Due to the top speed having a moderate correlation with price, there are outliers that do not accurately represent the correct relationship between the two. The average for top speed is 224.52, this usually leads to vehicles being priced around 64,000 dollars. The polynomial model has a strong correlation between the actual values and the predicted value.

From the graph above, we can see that the acceleration has a negative relationship with the price of the vehicle. Due to the acceleration having a moderate correlation with price, there are outliers that do not accurately represent the correct relationship between the two. The average for acceleration is 7.53, this usually leads to vehicles being priced around 61,000 dollars. The polynomial model has a strong correlation between the actual values and the predicted value.

Conclusion:

From the model created, we are able to predict the price of the vehicles based on the features it has. The polynomial model that was created has a high prediction rate where it can accurately predict the price of the car that a customer would want with a 87.8% efficiency. This is useful because it can help the customer determine what cars they would want, and it allows the car dealer and makers to create vehicles that would be affordable.