

Astron 98 Final Project: Analyzing the relationship between fuel economy and CO2 emissions for different cars.

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(code attached under project.ipynb in cookies repo)

Introduction: In this project I examined the relationship between fuel economy for different cars versus CO2 emissions for cars in the US.

Data

The data sets I will be using come from the EPA. This dataset has information about vehicle fuel efficiency ratings and associated CO2 emissions across different makes, models, and years

<https://www.epa.gov/automotive-trends/explore-automotive-trends-data#DetailedData>

(CSVs are in that link)

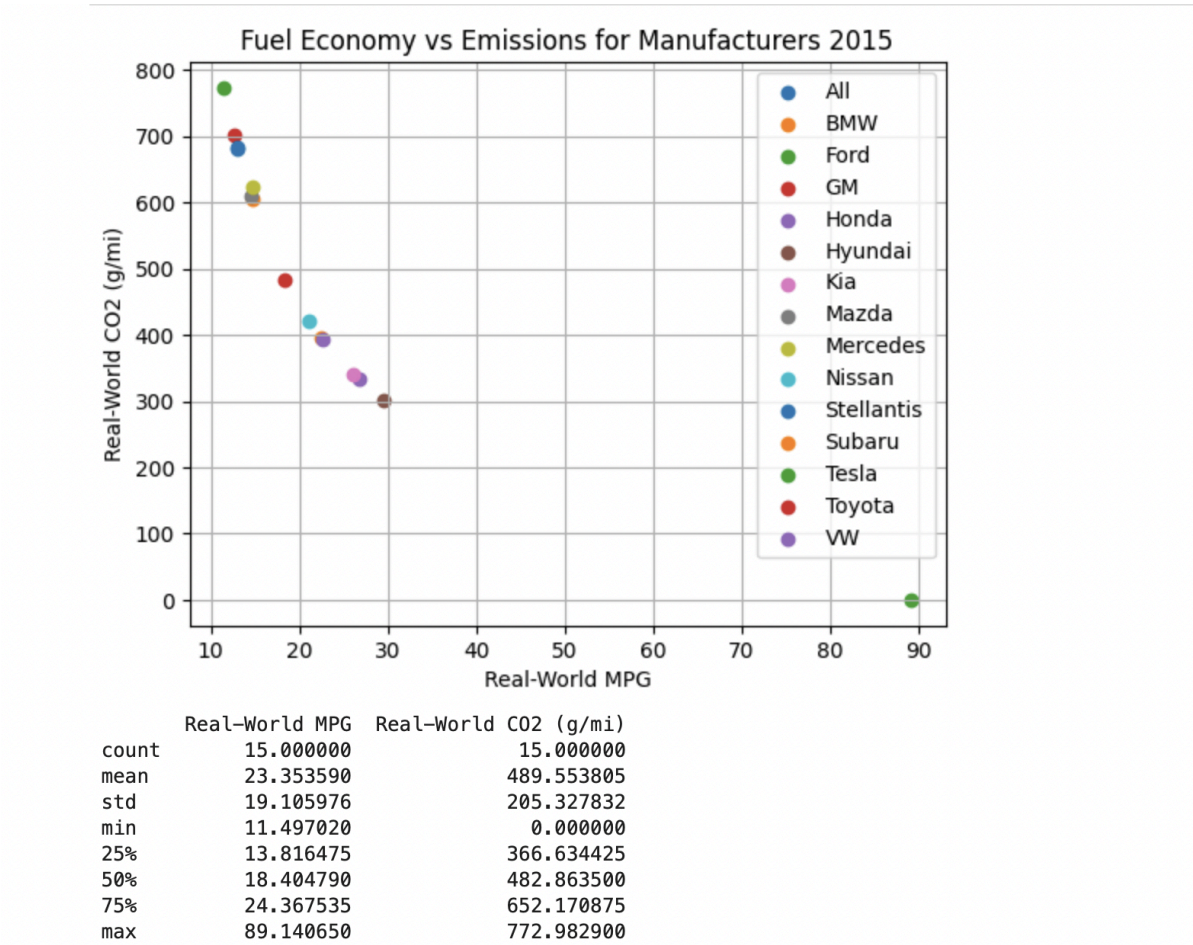
Data Collection/Processing

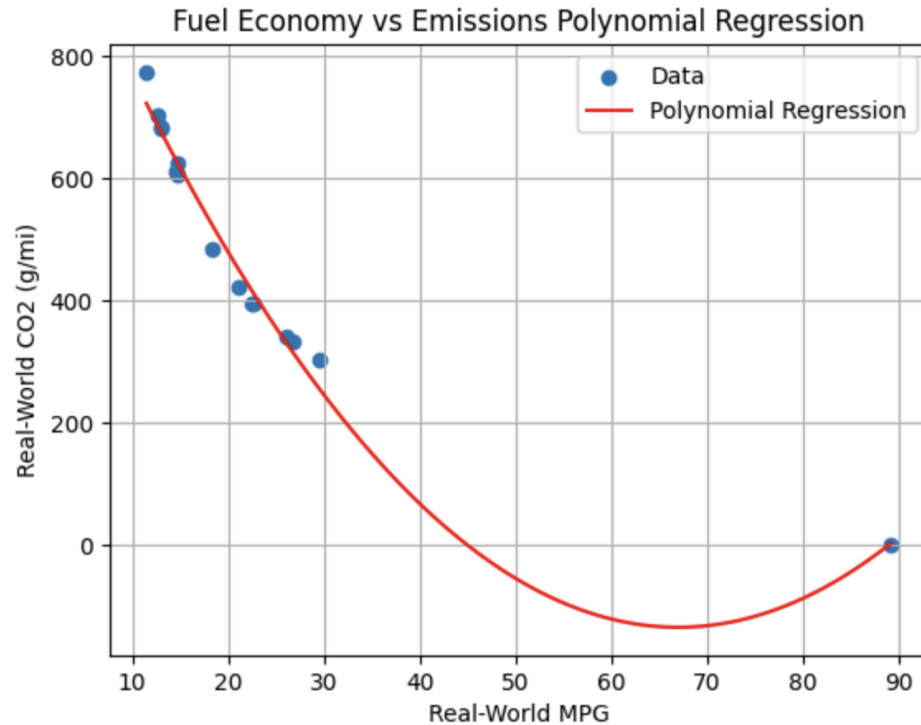
Data was collected from the EPA's Fuel Economy and Greenhouse Gas Emissions website.

Processing steps:

- Data Cleaning: Removing missing values and inconsistencies in the dataset.
 - This was done by using dropna
- Outlier Detection: Identifying outliers that skew the analysis
- Normalization: Scaling the data to ensure comparability across variables.

Results





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Analysis of Results:

To fit the curve a polynomial distribution seemed to be the best fit. Using the polynomial curve with a degree of 2 we were able to capture the curvature of the data. The coefficients for the polynomial regression were:

Coefficients: [0. -37.33182556 0.27878998]

Conclusion:

When choosing this topic I was aware that there was most likely going to be an inverse relationship between the emissions and the fuel economy for the cars and the analysis of the data proved this to be true. As we can see from the data as the fuel economy improves for the car the emissions decrease. I see this project as a first step to many because using this data we can analyze the correlation between pricing of cars and fuel economy and what that means for

emissions. Doing projects like these can one day hold companies responsible for their emissions and prove that the cost of the vehicle should be justified with their emissions as we head for a greener future.