

CO₂ Emissions and Fuel Consumption of Different Car Models

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Problem Overview



Predict CO₂ emissions (g/km) using car features



Potential Impact:

Quantify CO₂ emissions for a given car and driving regimen

Quantify vehicular CO₂ emissions in a jurisdiction (city, province, or Canada)



Assess how technology has evolved in reducing CO₂ emissions from 1995 - 2023

Dataset

Target variable: CO2 emissions (g/km)

Features:

- Car year
- Car make
- Vehicle class
- Engine size
- Fuel Type
- Transmission
- Cylinders
- Fuel consumption (city/hwy/combined)

Preprocessing and EDA



Strong positive correlation between CO2 emissions and:

Fuel consumption
Cylinders
Engine size

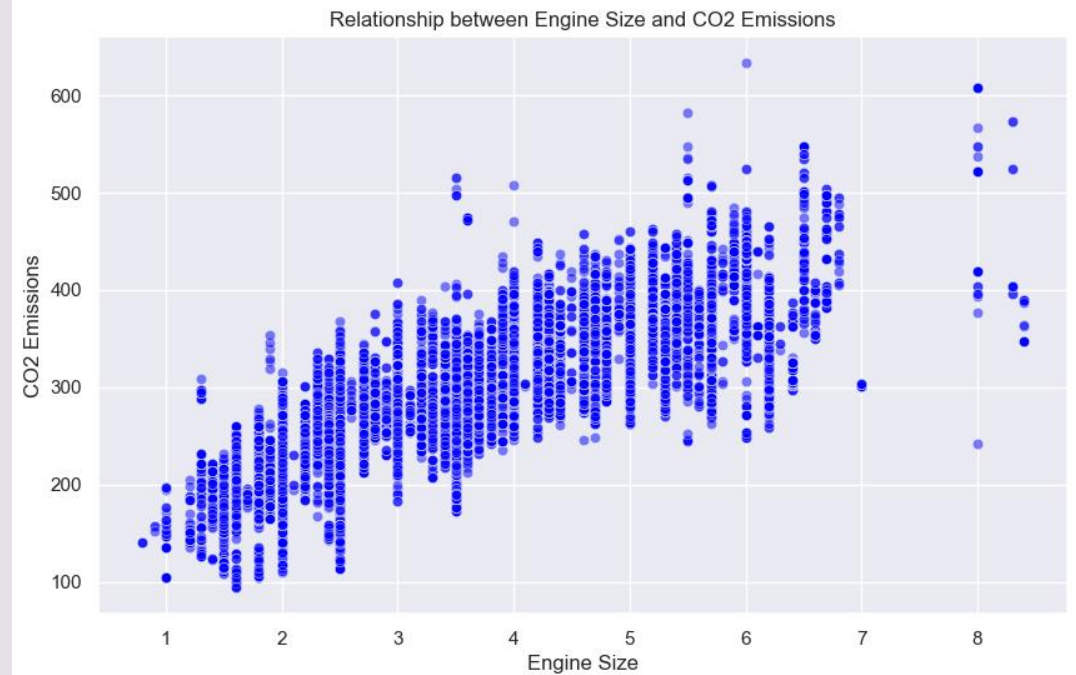
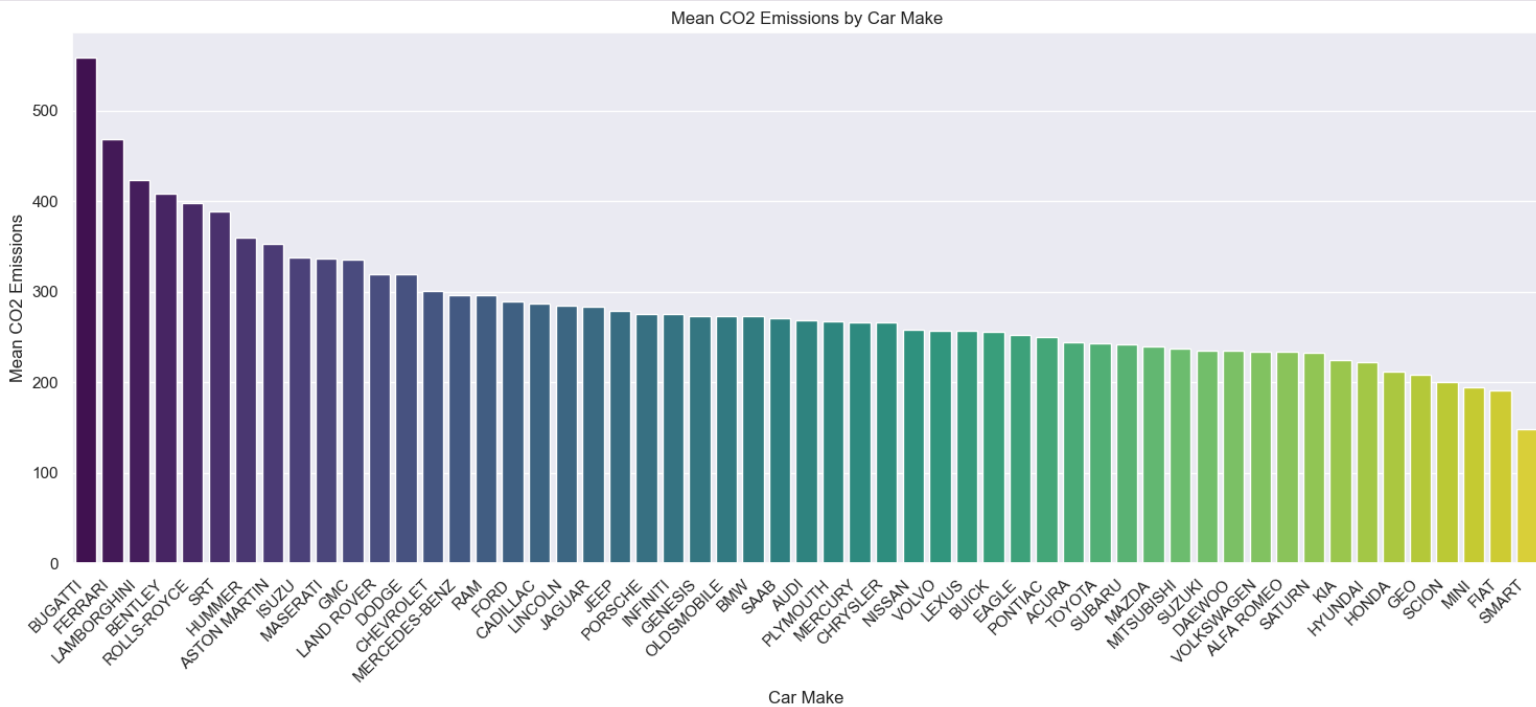


Bigger vehicles emit more CO2

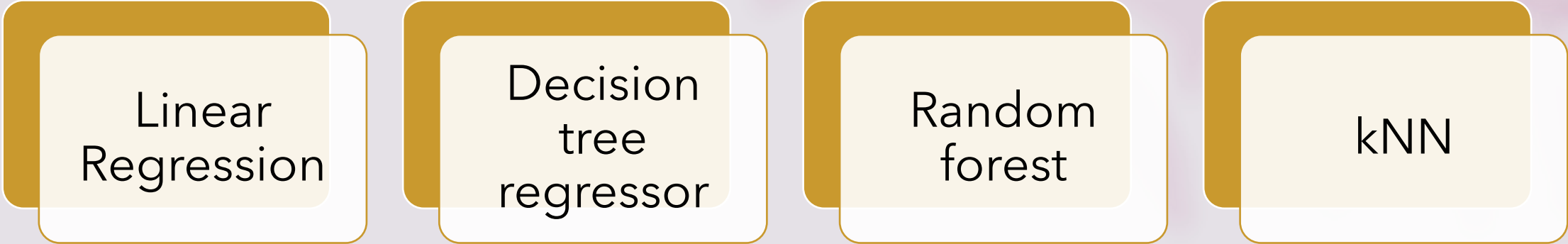


No strong correlation between year of car make and CO2 emissions

Suggests no drastic change in technology



Data Modeling Approach



Linear
Regression

Decision
tree
regressor

Random
forest

kNN

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Evaluation Metrics

Root mean
squared error
(RMSE)

R-squared

Percentage
mean absolute
error (PMAE)

Next Steps

Apply PCA

Decision tree regressor

kNN

Neural Networks



Thank you!