**Fuel Consumption ML Model Project**

This repository contains a Machine Learning (ML) model project for predicting fuel consumption. The purpose of this project is to build and train an ML model that can accurately predict fuel consumption based on input features. This README file provides instructions for setting up and using the project.

**Project Structure**

The project structure is organized as follows:

fuelconsumptionMLmodel /

├── data/

├── preprocessed\_data.csv

│ └── train\_test\_split/

├── notebooks/

│ └──fuelconsumptionMLmodel.ipynb

├── read me

**data/**: This directory contains the preprocessed used for training the model (**fuelconsumption.csv**).

**notebooks/**: This directory contains the Jupyter notebook (**fuelconsumptionMLmodel.ipynb**) that walks through the data exploration, preprocessing, model training, and evaluation steps.

This code snippet is a Python implementation for a Fuel Consumption ML Model Project. Here's a brief explanation of each part of the code:

1. **Data Loading and Exploration**: The code loads the fuel consumption data from a CSV file into a pandas DataFrame and displays the first few rows using the **head()** method. It also prints the column names of the DataFrame to identify the features and the target variable (CO2EMISSIONS).
2. **Scatter Plots**: The code uses matplotlib to plot scatter graphs between different independent variables (CYLINDERS, ENGINESIZE, and FUELCONSUMPTION\_COMB) and the dependent variable (CO2EMISSIONS). Each scatter plot visualizes the relationship between a specific independent variable and CO2 emissions.
3. **ML Model Training - Cylinder vs. CO2 Emissions**: The code splits the data into training and testing sets using **train\_test\_split**. It then trains a linear regression model using the independent variable 'CYLINDERS' and the dependent variable 'CO2EMISSIONS'. The model's accuracy is measured using the R-squared score (**r2\_score**), which indicates how well the model fits the data.
4. **ML Model Training - FuelConsumption\_comb vs. CO2 Emissions**: Similarly, the code trains another linear regression model using the independent variable 'FUELCONSUMPTION\_COMB' and the dependent variable 'CO2EMISSIONS'. The model's accuracy is again evaluated using the R-squared score.
5. **Results**: The code prints the accuracy scores of both models, indicating how well each model predicts CO2 emissions based on the respective independent variable.

In summary, this code snippet demonstrates the process of loading and exploring the fuel consumption data, visualizing the relationships between different features and CO2 emissions using scatter plots, and training two separate ML models to predict CO2 emissions based on the independent variables 'CYLINDERS' and 'FUELCONSUMPTION\_COMB'. The accuracy scores indicate the performance of each model in predicting CO2 emissions.