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# 1. Import the necessary libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')

# 2. Load the dataset
url = "https://raw.githubusercontent.com/jbrownlee/Datasets/master/autosmpg主要数据.csv"
data = pd.read_csv(url)

# 3. Data Exploration
print(data.shape)
print(data.columns)
print(data.head())

# 4. Data Cleaning
data.dropna(inplace=True)
data = data.reset_index(drop=True)

# 5. Data Preprocessing
data['displacement'] = data['displacement'].astype(int)
data['horsepower'] = data['horsepower'].astype(int)
data['weight'] = data['weight'].astype(int)
data['acceleration'] = data['acceleration'].astype(float)
data['mpg'] = data['mpg'].astype(float)

# 6. Feature Engineering
data['displacement_horsepower'] = data['displacement'] * data['horsepower']
data['weight_acceleration'] = data['weight'] * data['acceleration']

# 7. Data Visualization
sns.pairplot(data)
plt.show()

# 8. Model Training
from sklearn.model_selection import train_test_split
X = data[['displacement', 'horsepower', 'weight', 'acceleration']]
y = data['mpg']
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)

# 9. Model Evaluation
from sklearn.metrics import mean_squared_error, r2_score
from sklearn.linear_model import LinearRegression

model = LinearRegression()
model.fit(X_train, y_train)

y_pred = model.predict(X_test)
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print(f'MSE: {mse}, R2: {r2}')

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Neuropsins

Go-opsins

Chromonsin

Outgroup