**Exp no: 4**

**Vehicle Performance Analysis using pandas**

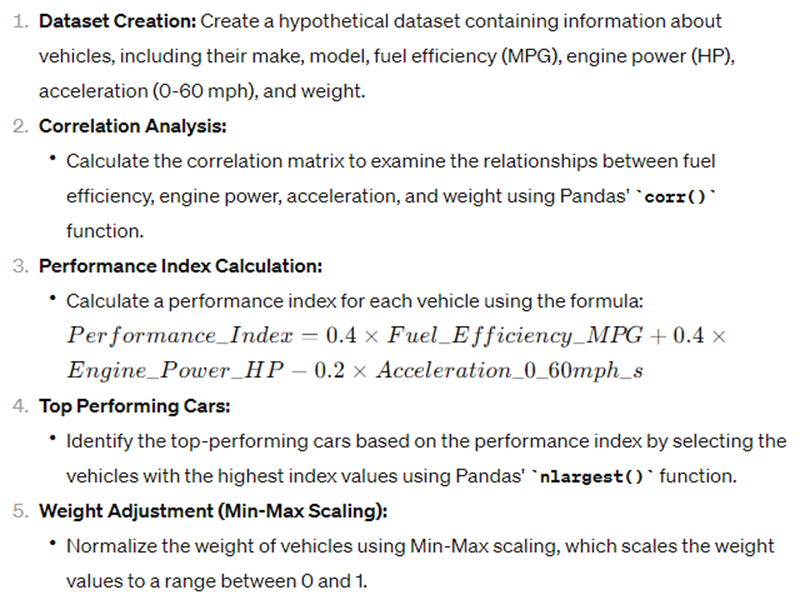
**AIM:**

To analyze the performance attributes of different vehicles using Pandas.

**SOFTWARE REQUIRED:**

∙ Python environment with Pandas and NumPy installed.

**PROCEDURE:**

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**Program**

import pandas as pd

import numpy as np

# Creating a hypothetical dataset

data = {

'Make': ['Toyota', 'Honda', 'Ford', 'Chevrolet', 'Nissan'],

'Model': ['Camry', 'Civic', 'Fusion', 'Malibu', 'Altima'],

'Fuel\_Efficiency\_MPG': [28, 36, 30, 32, 26],

'Engine\_Power\_HP': [203, 158, 181, 163, 188],

'Acceleration\_0\_60mph\_s': [7.5, 8.2, 6.9, 8.0, 6.2],

'Weight\_kg': [1500, 1300, 1400, 1350, 1550]

}

car\_performance\_df = pd.DataFrame(data)

# Task 1: Correlation Analysis

correlation\_matrix = car\_performance\_df[['Fuel\_Efficiency\_MPG', 'Engine\_Power\_HP', 'Acceleration\_0\_60mph\_s', 'Weight\_kg']].corr()

# Task 2: Performance Index Calculation

car\_performance\_df['Performance\_Index'] = (

0.4 \* car\_performance\_df['Fuel\_Efficiency\_MPG'] +

0.4 \* car\_performance\_df['Engine\_Power\_HP'] -

0.2 \* car\_performance\_df['Acceleration\_0\_60mph\_s']

)

# Task 3: Top Performing Cars

top\_performing\_cars = car\_performance\_df.nlargest(2, 'Performance\_Index')

# Task 4: Weight Adjustment (Min-Max scaling)

min\_max\_scaler = lambda x: (x - np.min(x)) / (np.max(x) - np.min(x))

car\_performance\_df['Weight\_normalized'] = car\_performance\_df[['Weight\_kg']].apply(min\_max\_scaler)

# Output

print("Correlation Matrix:")

print(correlation\_matrix)

print("\nDataFrame with Performance Index:")

print(car\_performance\_df[['Make', 'Model', 'Performance\_Index']])

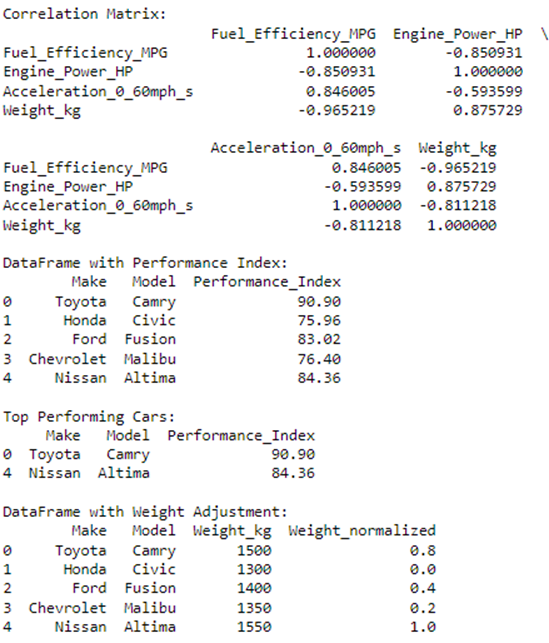
print("\nTop Performing Cars:")

print(top\_performing\_cars[['Make', 'Model', 'Performance\_Index']])

print("\nDataFrame with Weight Adjustment:")

print(car\_performance\_df[['Make', 'Model', 'Weight\_kg', 'Weight\_normalized']])

**OUTPUT:**



**Results:**

∙ For this data set it is found that Toyota camry is having high performing index.

∙ Through this experiment, we successfully analyzed the performance attributes of

vehicles using Pandas.

∙ By calculating correlations, performance indices, and performing weight adjustments,

we gained valuable insights into the performance characteristics of different vehicles.

∙ This experiment demonstrates the power of data analysis techniques in evaluating and

comparing vehicle performance.