

**Elias Shaheen**

**20191102022 applying different algorithms**

**Gas Turbine CO and NOx Emission Dataset (YEAR 2014 DATASET) (before data processing):**

**Using linear Regression**

!pip install scikit-learn

import os

from google.colab import files

import pandas as pd

from sklearn.model\_selection import train\_test\_split

from sklearn.linear\_model import LinearRegression

from sklearn.metrics import mean\_squared\_error, mean\_absolute\_error, r2\_score

# Print the current working directory

print("Current Working Directory:", os.getcwd())

# List files in the current directory

print("Files in the Directory:", os.listdir())

# Upload the 'gt\_2014.csv' file

uploaded = files.upload()

# Get the file name from the uploaded files

file\_name = list(uploaded.keys())[0]

# Load the dataset

df = pd.read\_csv(file\_name)

# Assuming your features are in columns 'AT', 'AP', 'AH', ..., 'CDP'

# and the target variable is in 'CO' and 'NOX'

features = df[['AT', 'AP', 'AH', 'AFDP', 'GTEP', 'TIT', 'TAT', 'TEY', 'CDP']]

target\_CO = df['CO']

target\_NOX = df['NOX']

# Split the data into training and testing sets

X\_train\_CO, X\_test\_CO, y\_train\_CO, y\_test\_CO = train\_test\_split(features, target\_CO, test\_size=0.2, random\_state=42)

X\_train\_NOx, X\_test\_NOx, y\_train\_NOx, y\_test\_NOx = train\_test\_split(features, target\_NOX, test\_size=0.2, random\_state=42)

# Create linear regression models

model\_CO = LinearRegression()

model\_NOx = LinearRegression()

# Train the models

model\_CO.fit(X\_train\_CO, y\_train\_CO)

model\_NOx.fit(X\_train\_NOx, y\_train\_NOx)

# Make predictions

predictions\_CO = model\_CO.predict(X\_test\_CO)

predictions\_NOx = model\_NOx.predict(X\_test\_NOx)

# Evaluate the models

mse\_CO = mean\_squared\_error(y\_test\_CO, predictions\_CO)

mae\_CO = mean\_absolute\_error(y\_test\_CO, predictions\_CO)

r2\_CO = r2\_score(y\_test\_CO, predictions\_CO)

mse\_NOx = mean\_squared\_error(y\_test\_NOx, predictions\_NOx)

mae\_NOx = mean\_absolute\_error(y\_test\_NOx, predictions\_NOx)

r2\_NOx = r2\_score(y\_test\_NOx, predictions\_NOx)

# Display the evaluation metrics

print("CO Emission Predictions:")

print("Mean Squared Error:", mse\_CO)

print("Mean Absolute Error:", mae\_CO)

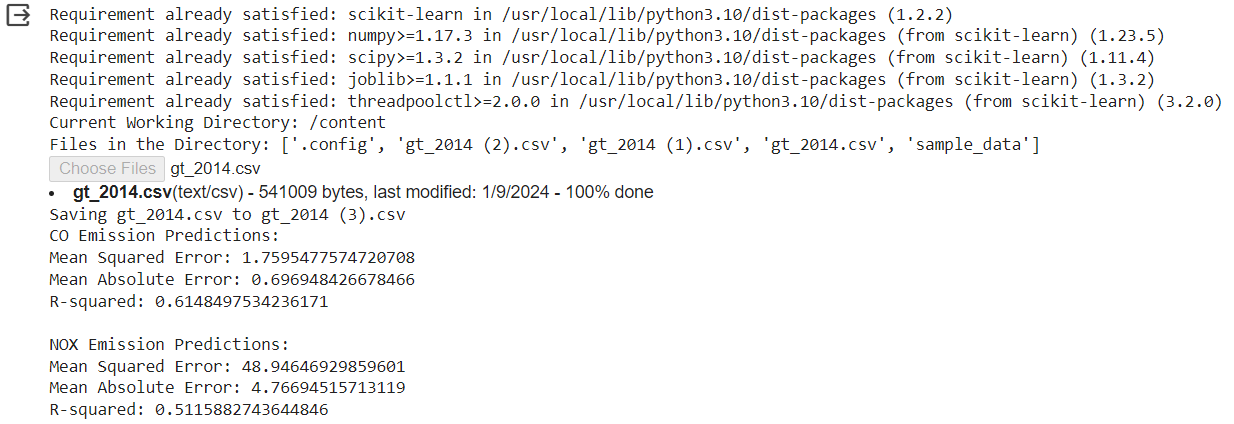
print("R-squared:", r2\_CO)

print("\nNOX Emission Predictions:")

print("Mean Squared Error:", mse\_NOx)

print("Mean Absolute Error:", mae\_NOx)

print("R-squared:", r2\_NOx)

***results using colab***