import pandas as pd

from sklearn.ensemble import GradientBoostingRegressor

# Load the dataset

data\_path = r" "

df = pd.read\_csv(data\_path)

# Training data

X = df[["Fe2O3 Dose (mol%)", "Temperature", "Concentration"]] # Features

y = df["Response"] # Target variable

# Initialize and train the Gradient Boosting model

model = GradientBoostingRegressor()

model.fit(X, y)

# Create test data

test\_data = pd.DataFrame({

"Fe2O3 Dose (mol%)": [0, 1, 2, 3, 4],

"Temperature": [25, 25, 25, 25, 25],

"Concentration": [0.4, 0.4, 0.4, 0.4, 0.4]

})

# Make predictions

predictions = model.predict(test\_data)

# Output the prediction results

print("Predicted Sensitivity for Concentration=0.4, Temperature=25, Fe2O3 Dose (mol%)=[0, 1, 2, 3, 4]:")

for i, pred in enumerate(predictions):

print(f"Fe2O3 Dose mol% = {i}: {pred:.2f}")