import pandas as pd

from sklearn.ensemble import GradientBoostingRegressor

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

# Load the dataset

file\_path = r" "

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

# Ensure the column order is: concentration, temperature, response time, and response

# Adjust the column names according to your actual dataset if needed

data = data[['concentration', 'temperature', 'respond time', 'response']]

# Features and target variable

X = data[['concentration', 'temperature', 'respond time']] # Features

y = data['response'] # Target variable (responsivity)

# Split the dataset into training and testing sets

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

# Create and train the Gradient Boosting model

gbr = GradientBoostingRegressor(random\_state=42)

gbr.fit(X\_train, y\_train)

# Construct test data with specific conditions

specific\_conditions = pd.DataFrame({

'concentration': [5, 10, 25, 50, 75, 100, 125], # Concentration values

'temperature': [25] \* 7, # Temperature values (constant at 25°C)

'respond time': [36, 81, 114, 130, 150, 174, 198] # Response times

})

# Make predictions using the model

specific\_predictions = gbr.predict(specific\_conditions)

# Create a DataFrame for the results

specific\_results = specific\_conditions.copy()

specific\_results['prediction'] = specific\_predictions # Add predicted values

# Print the results

print(specific\_results)