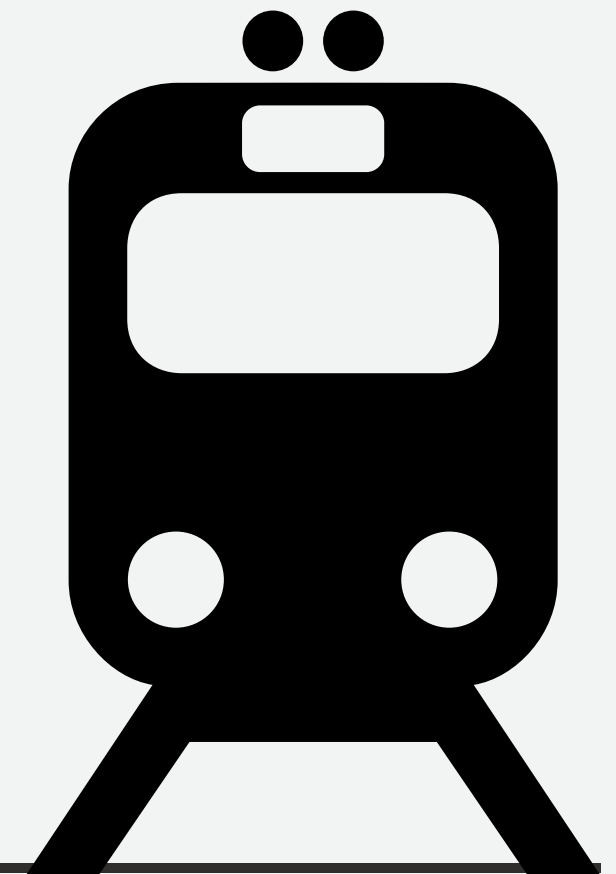


ANDREEA STROIA
HRITIKA KATHURIA
HALA ALBAHLOUL



AIR QUALITY

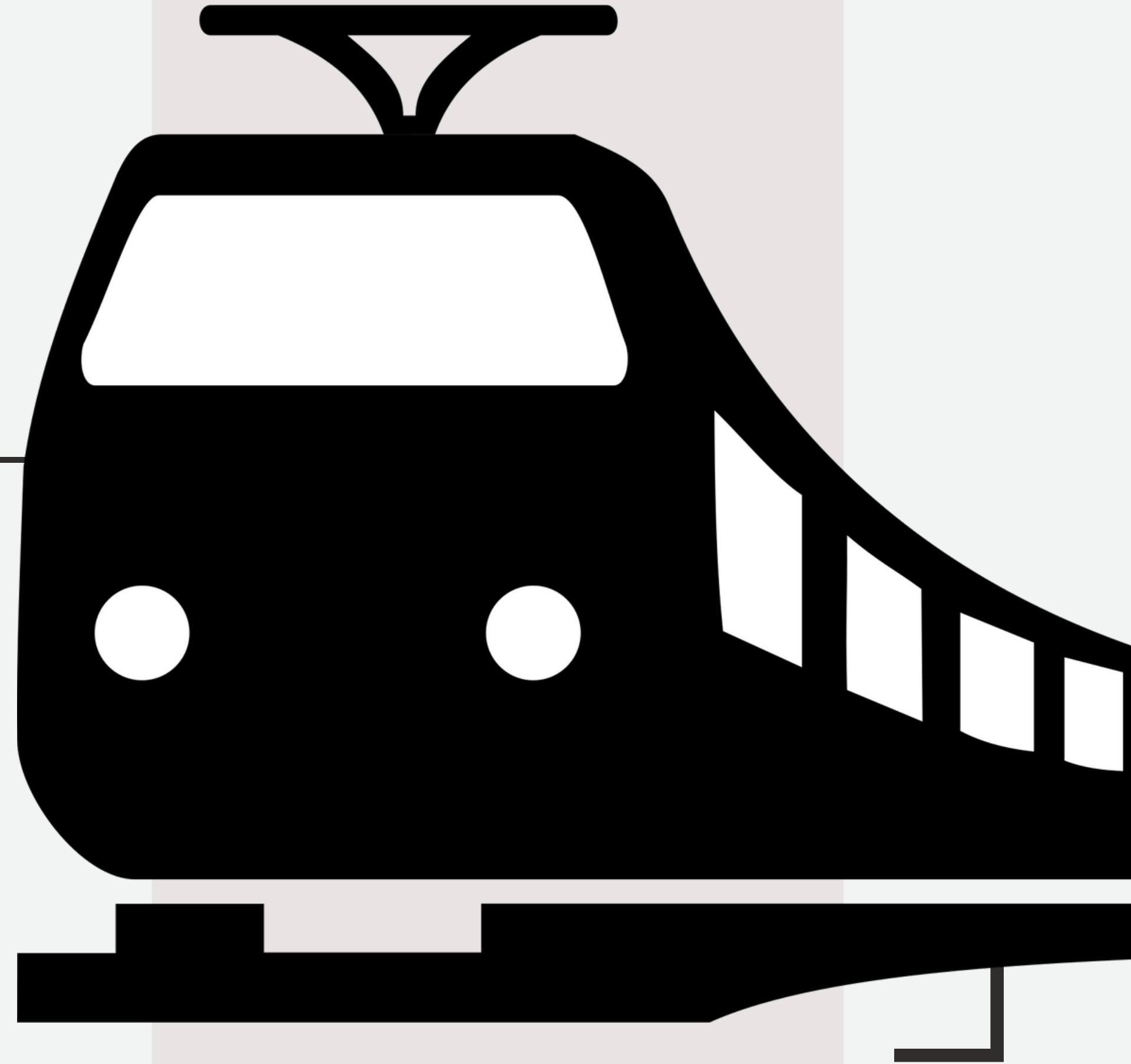


Metro stations : Chatelet & Auber & Roosevelt

Overview

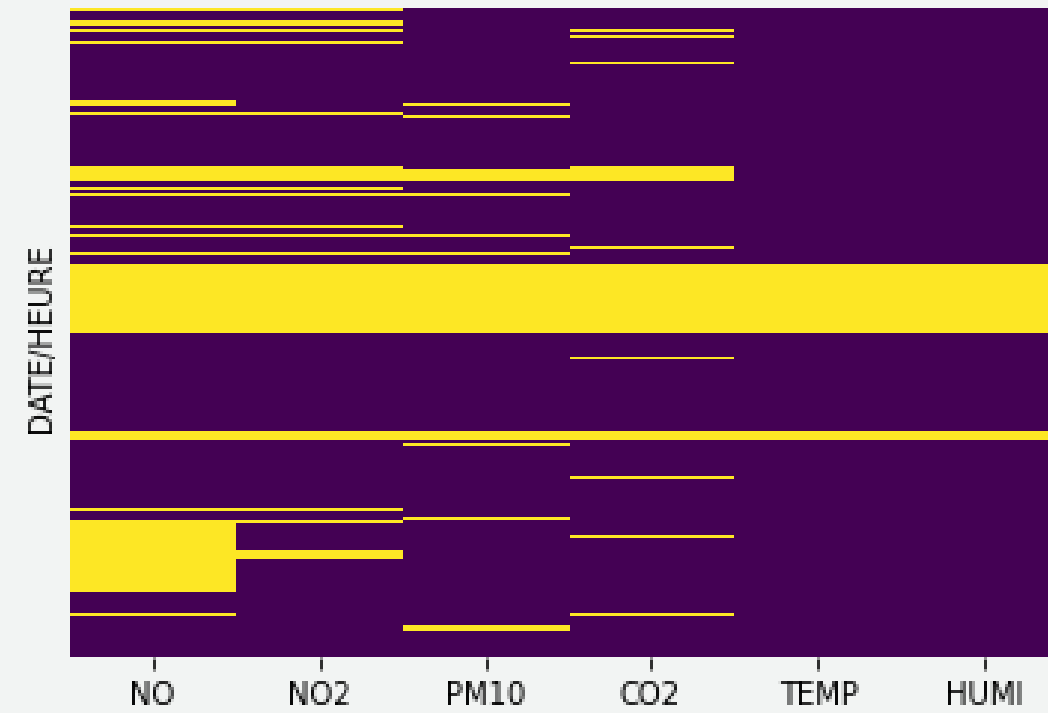
WHAT WE DID;

- Missing values
- Predicting CO₂ for Chatelet
- Predicting NO₂ for Chatelet
- Comparing models

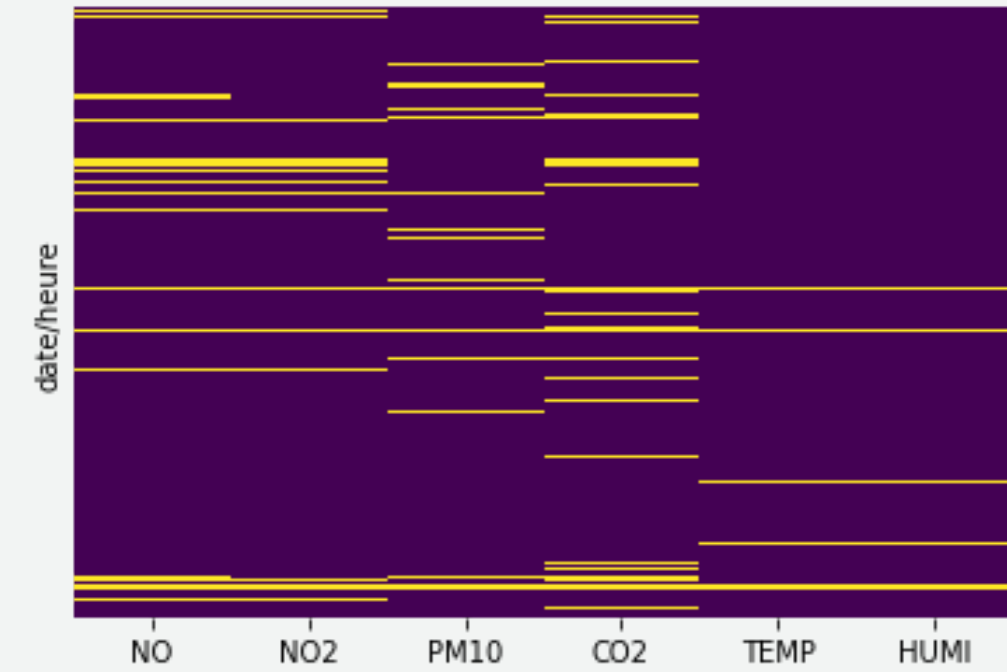


Missing values

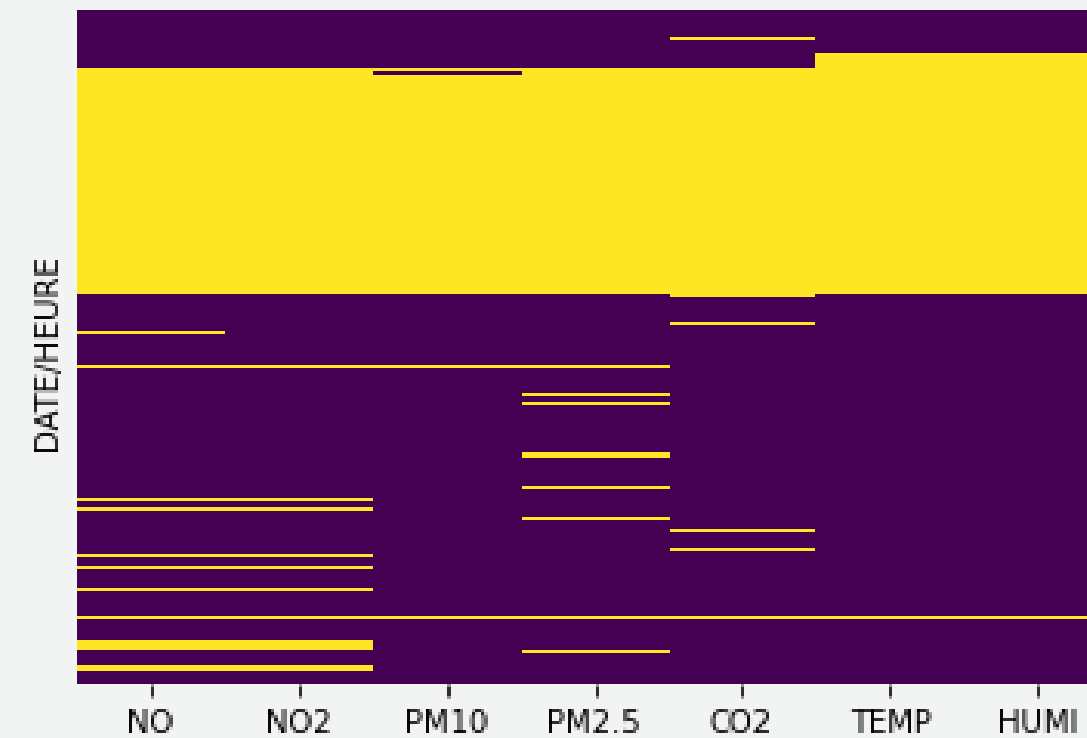
- Drop rows with all NAs
- Replace ND
- Replace , < and >
- BFill values
- Convert to float



Chatelet



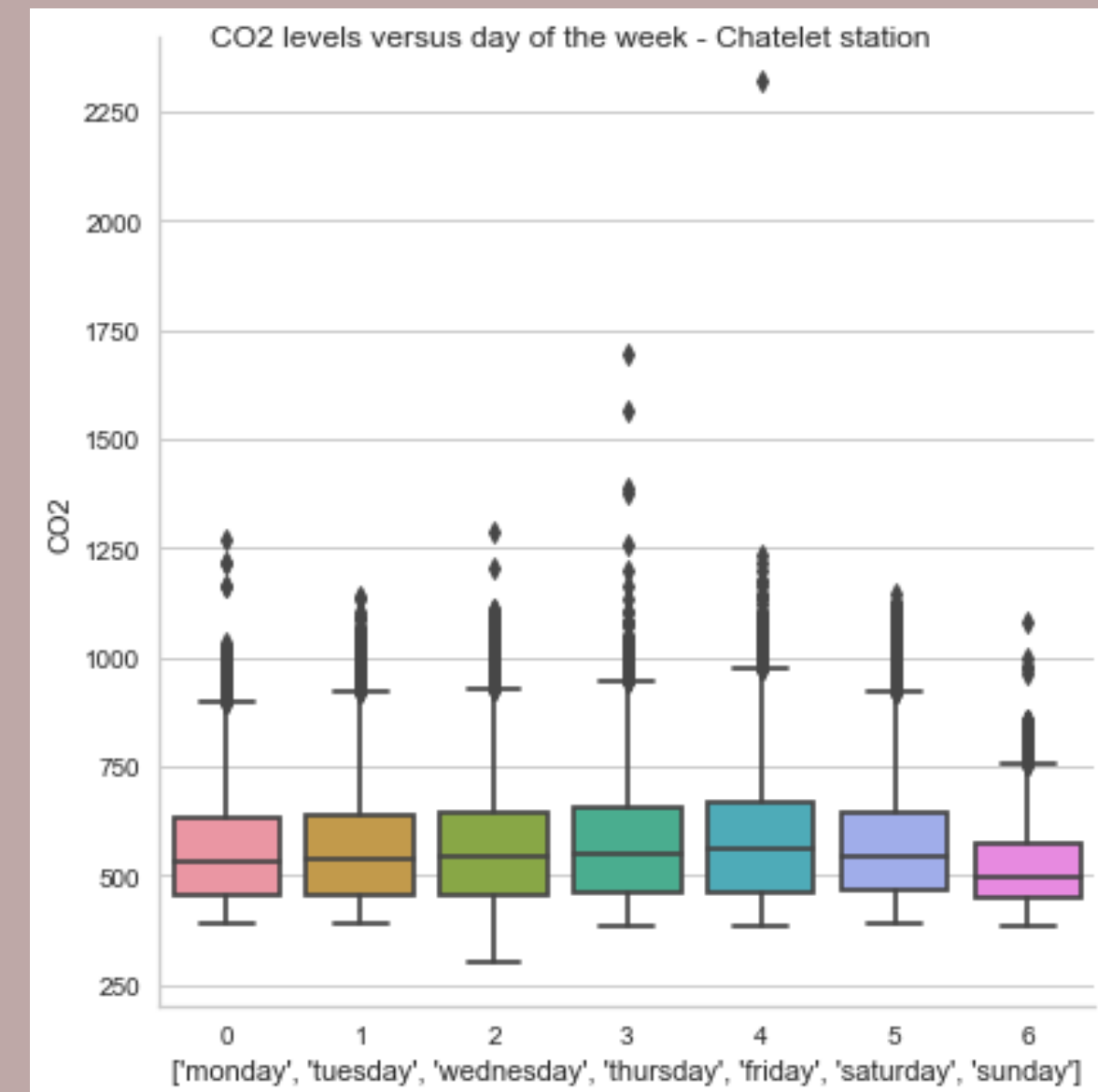
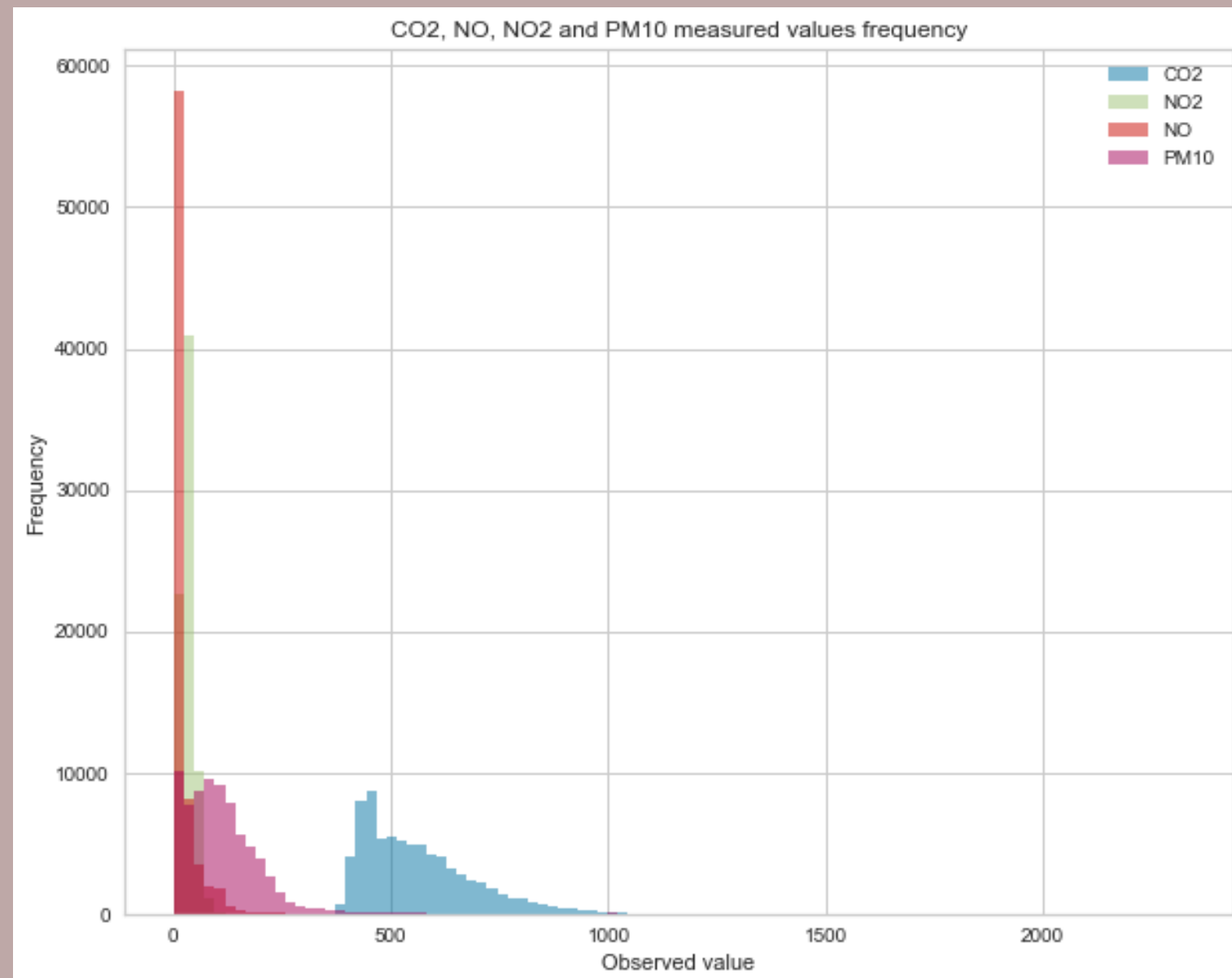
Roosevelt



Auber

Exploratory Data Analysis

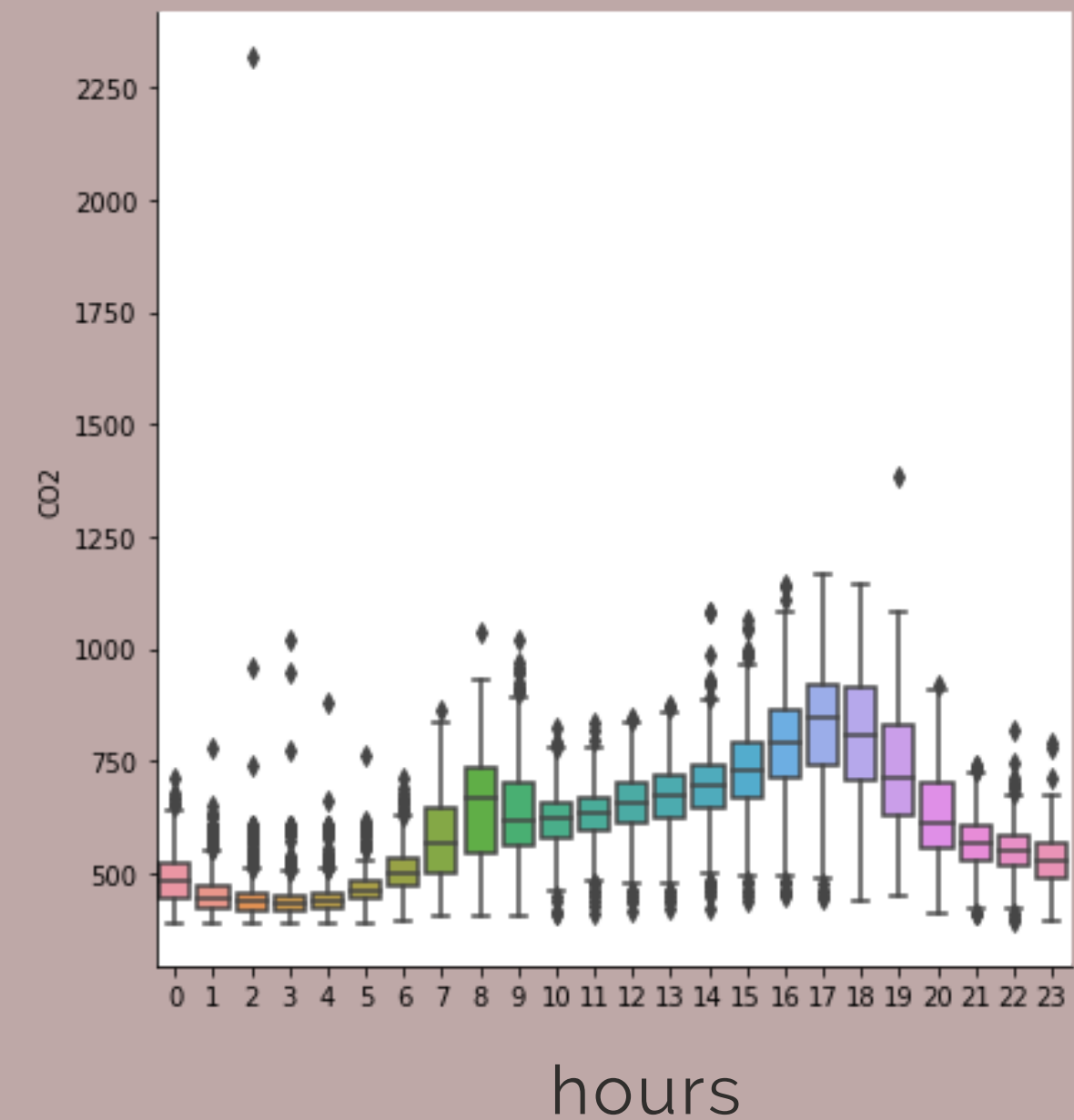
Value range : 2013- 2016



Predicting CO₂ from time of day, temperature and humidity

-CHATELET-

Value range : 2013- 2016

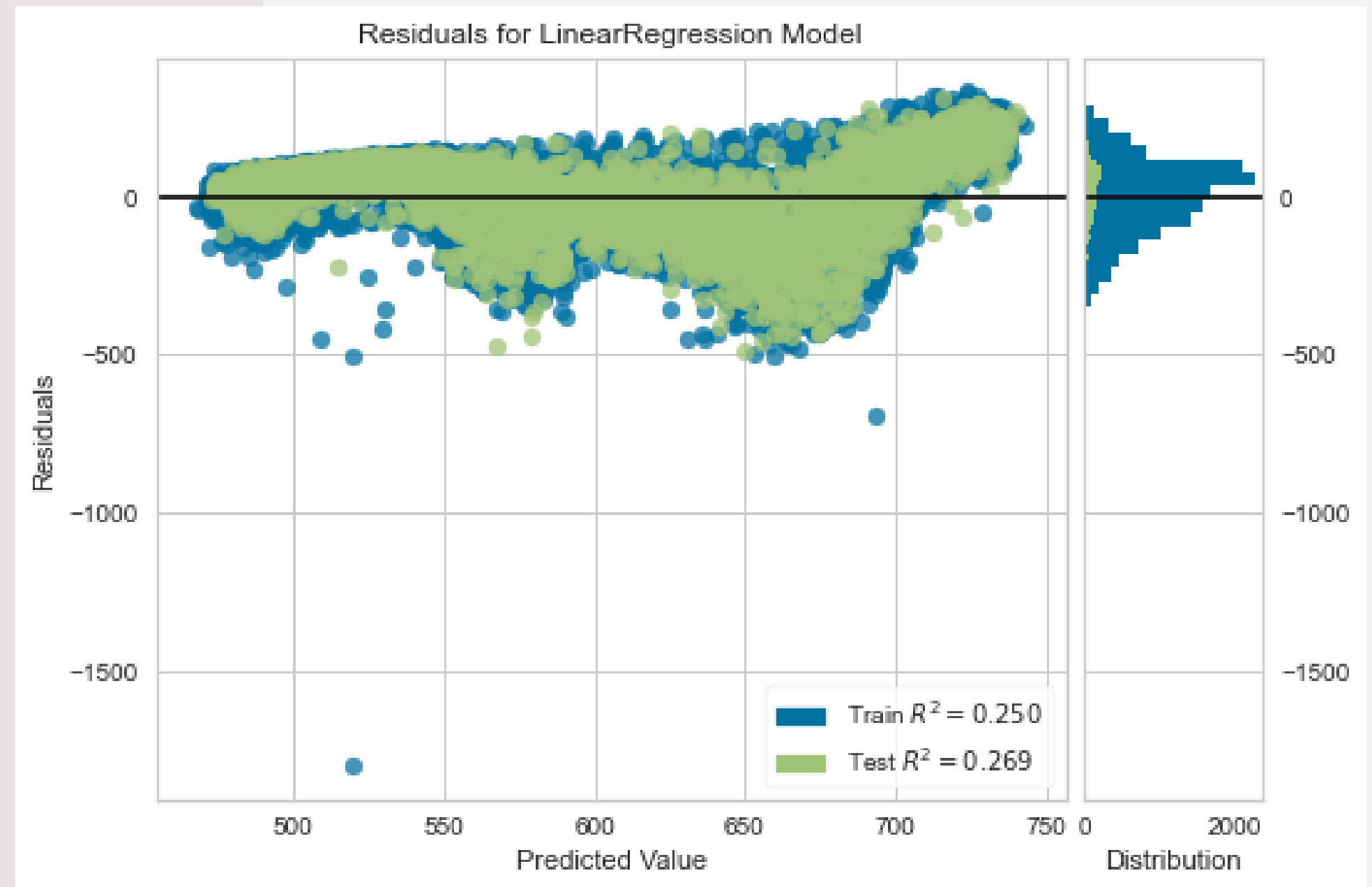


Predictions

Predictions for 2016-2022

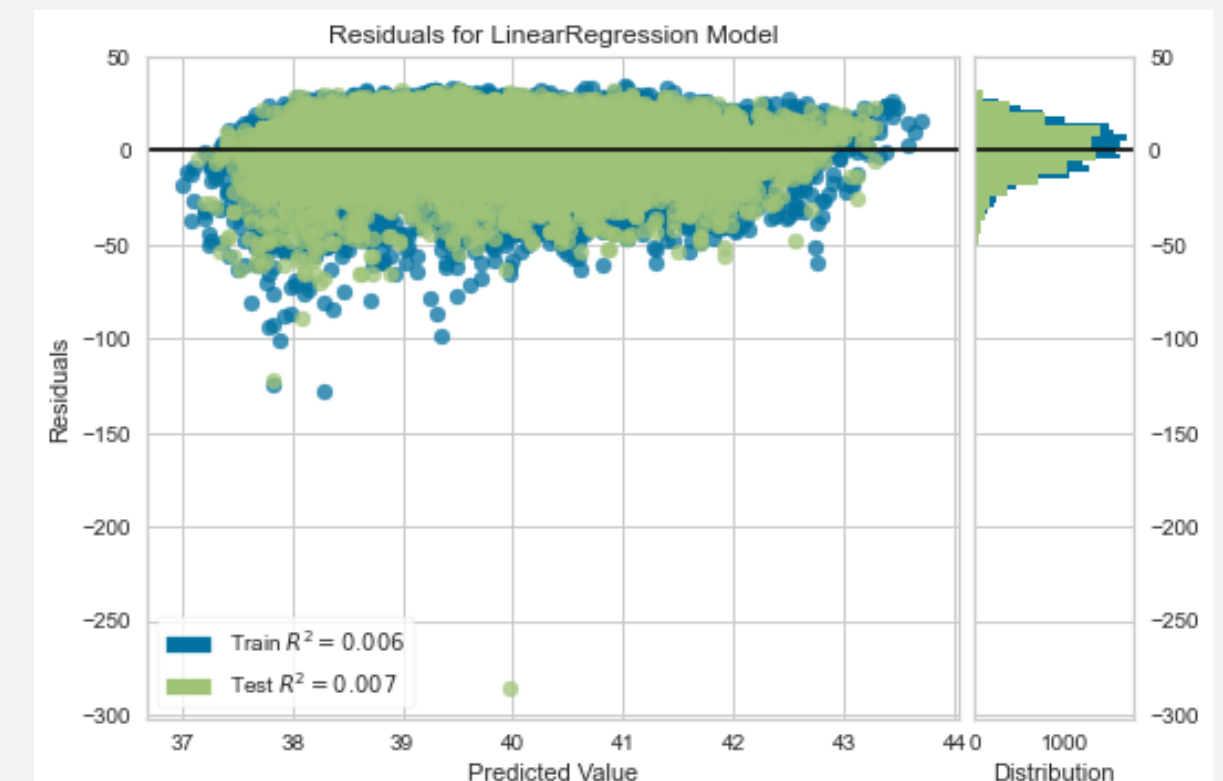
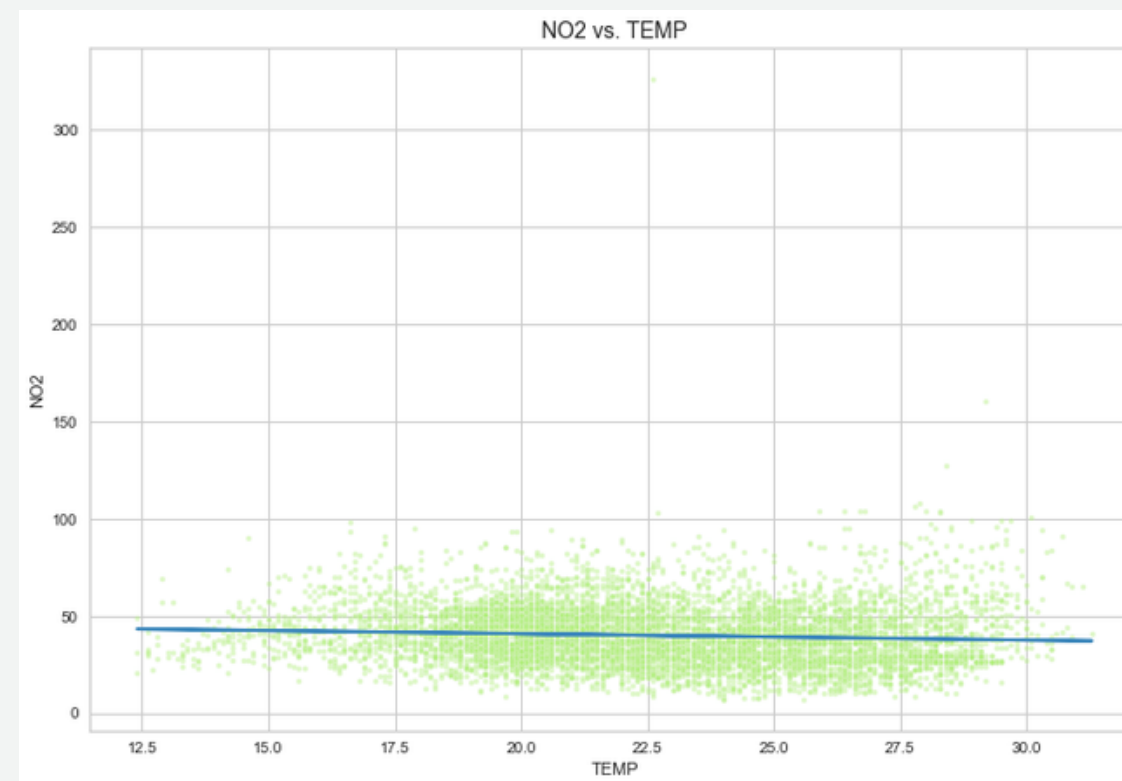
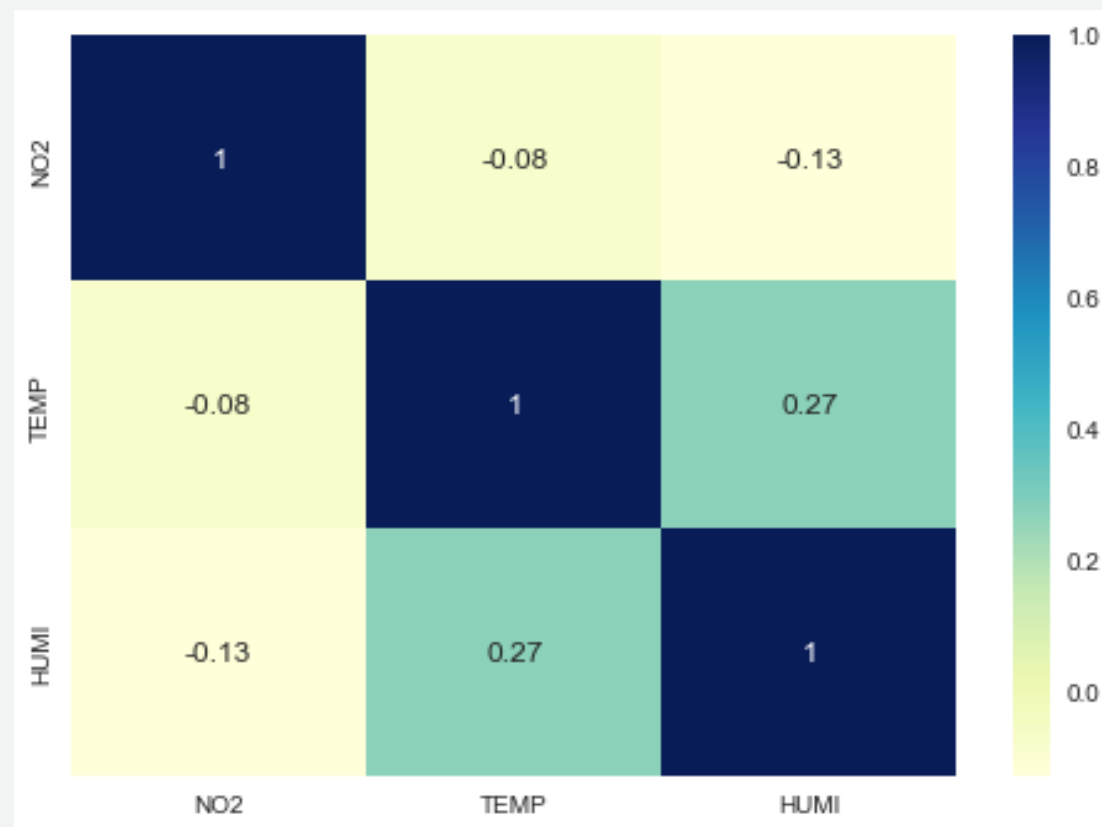
```
[[497.7235442 ],  
 [740.12767956],  
 [728.37994881],  
 ...,  
 [529.83469281],  
 [519.00347581],  
 [509.05179563]]
```

- The Mean Absolute Error: 97.74
- The Median Absolute Error: 81.36



Linear Regression

NO₂ vs TEMP

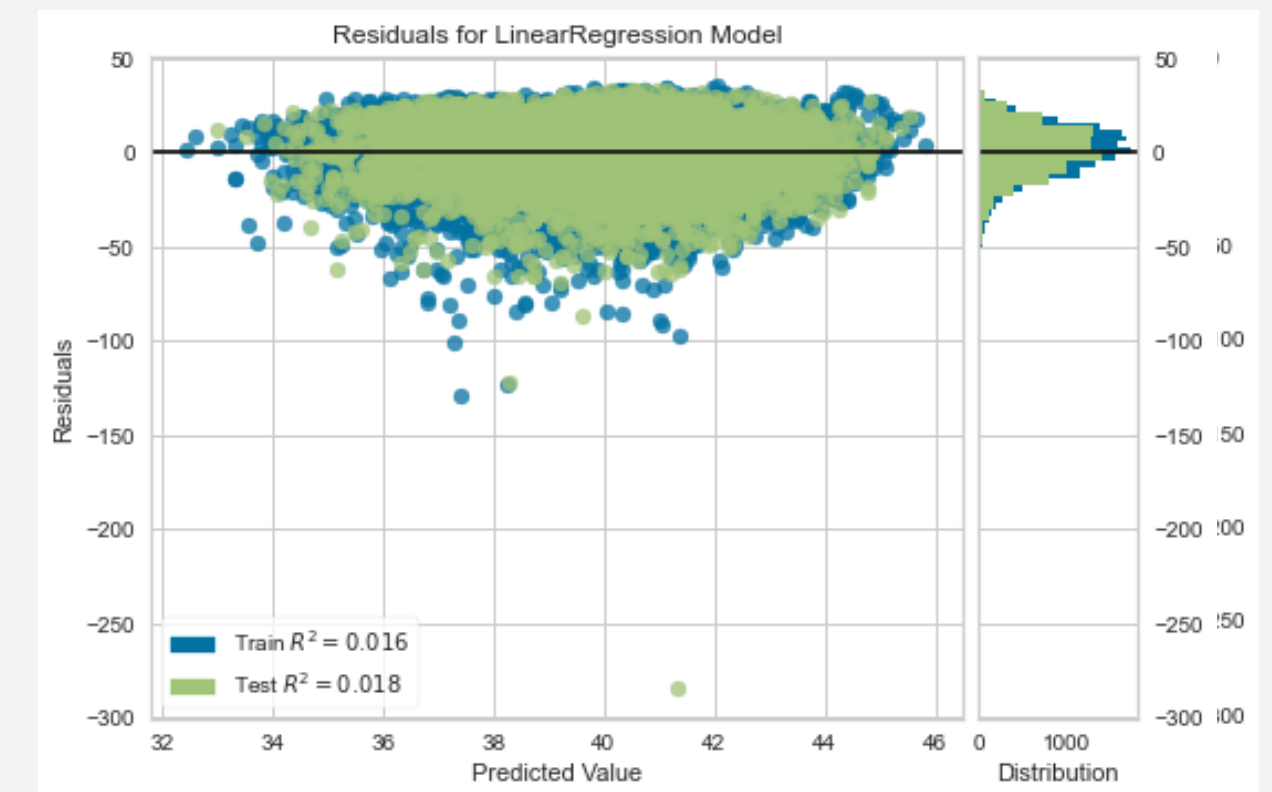
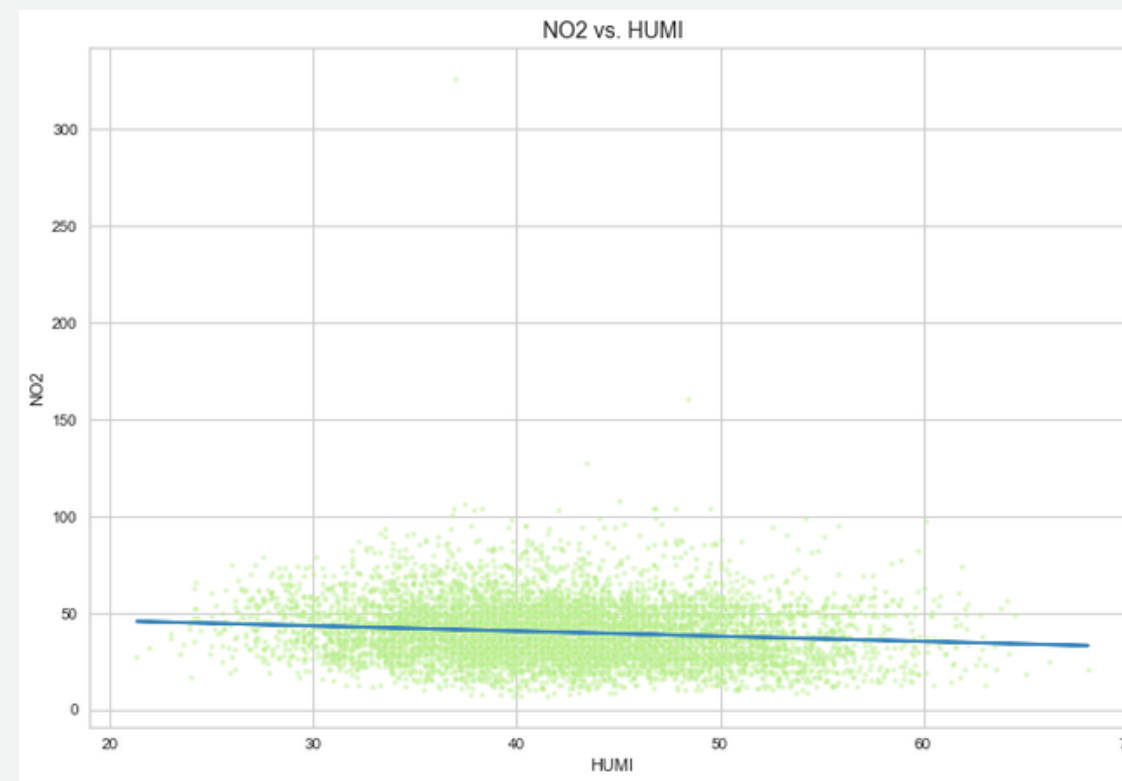
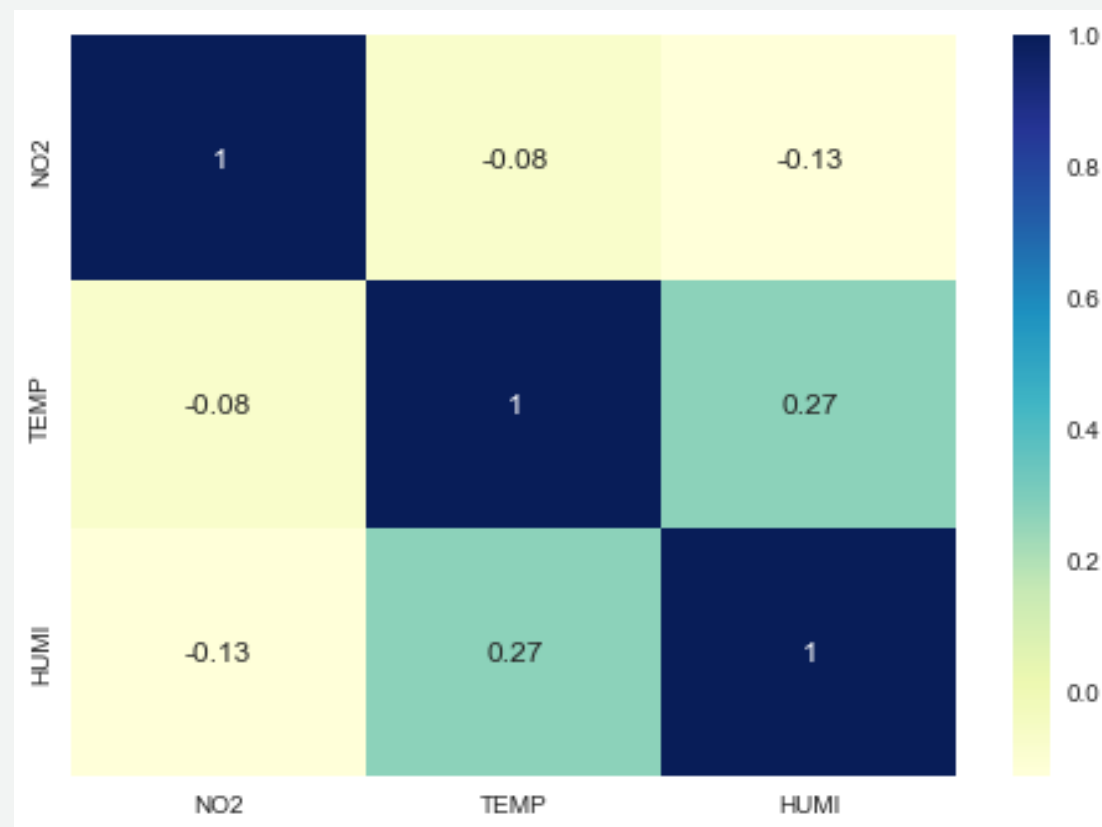


Heatmap

Slope: `[[-0.32476106]]`
Intercept: `[47.30677617]`
Mean squared error: 225.26
Root mean squared error: 15.01
R2 score: 0.007003440753828305

Linear Regression

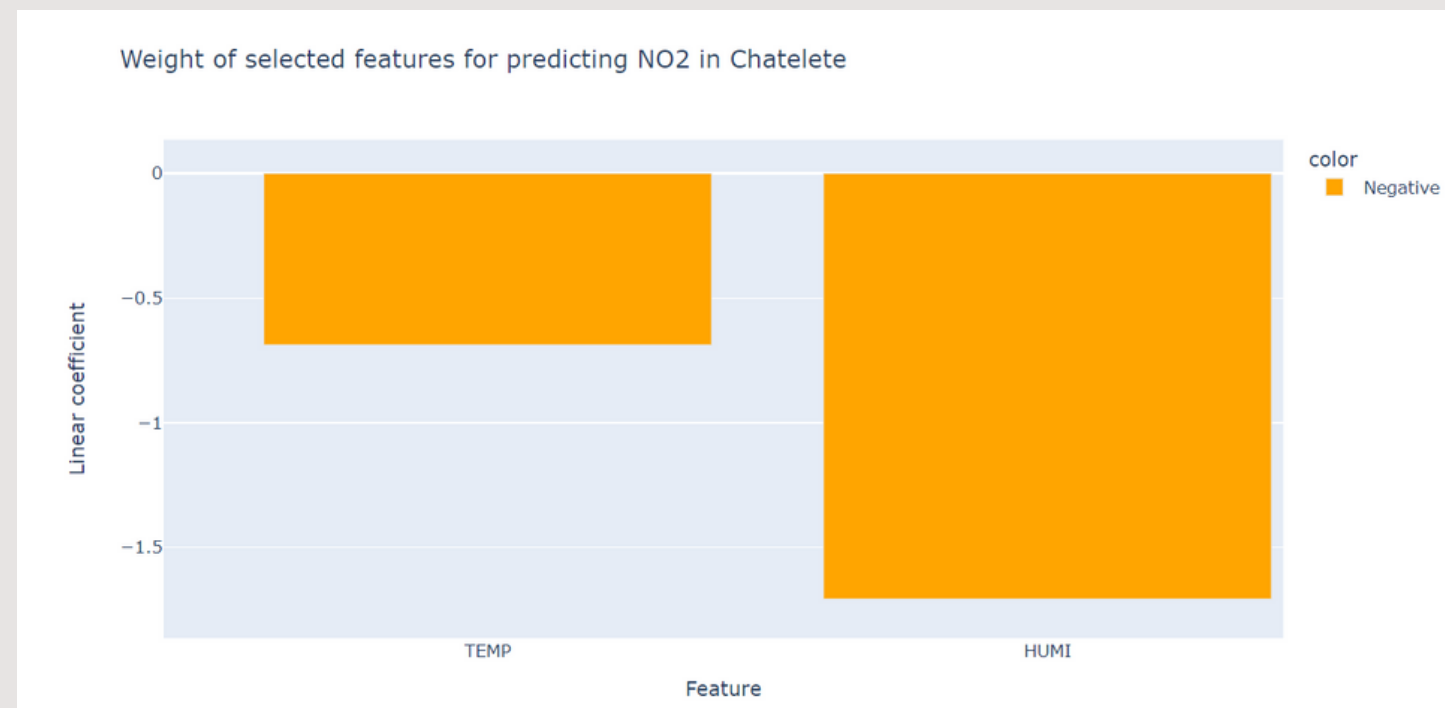
NO₂ vs HUMI



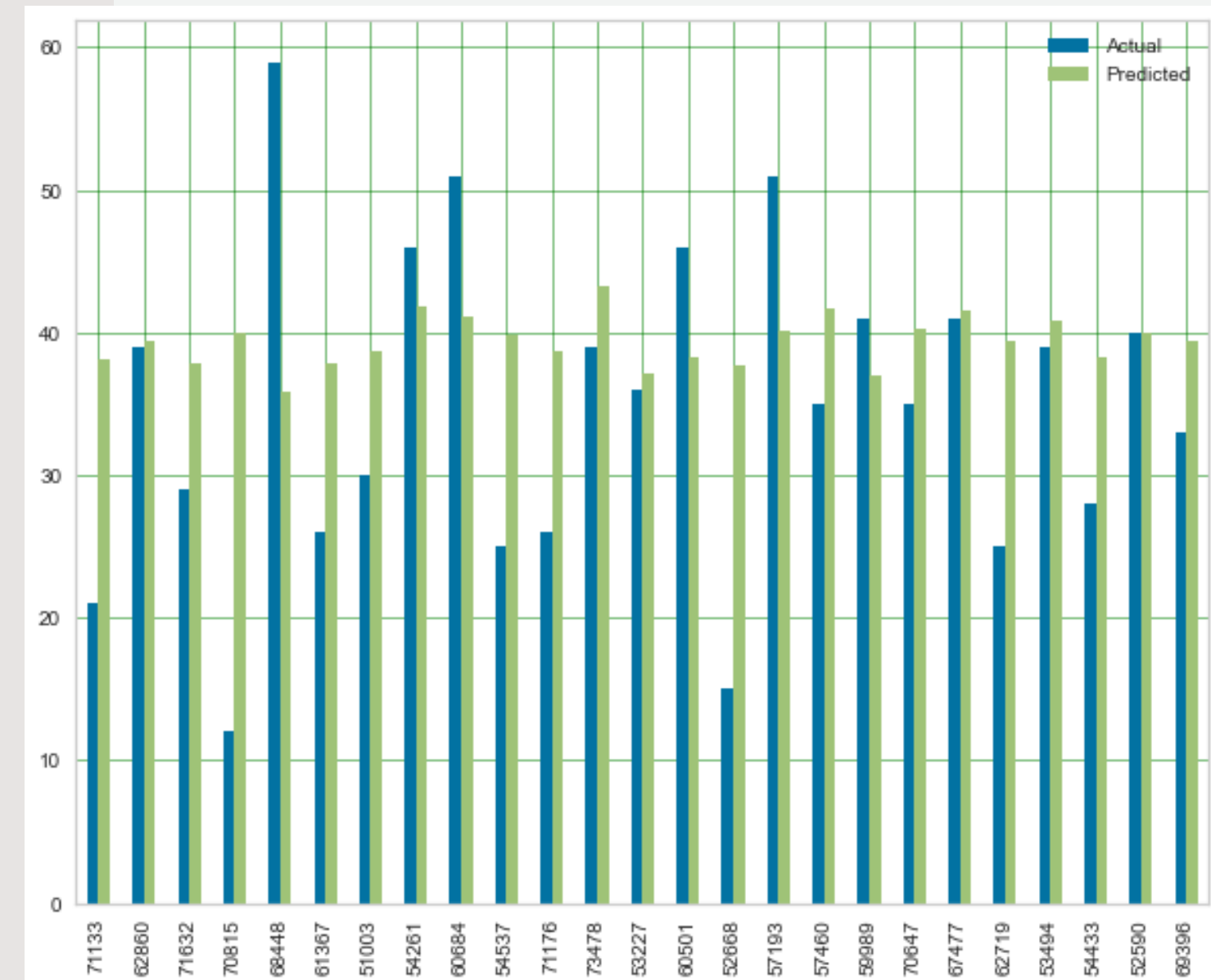
Heatmap

Slope: `[[-0.26709828]]`
Intercept: `[51.2163539]`
Mean squared error: 222.85
Root mean squared error: 14.93
R2 score: `0.017605094473889027`

Predict NO/NO₂/PM₁₀ levels in a selected station from past values, temperature and humidity.



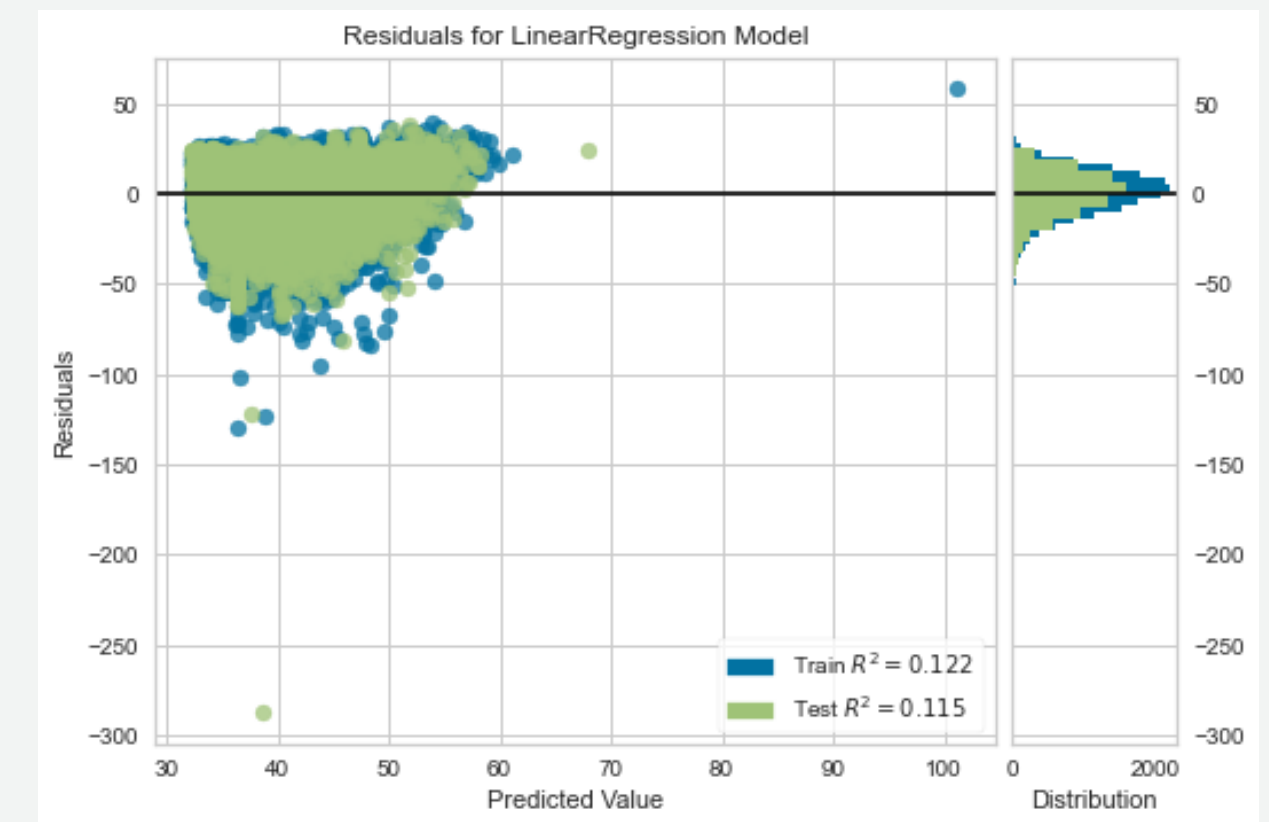
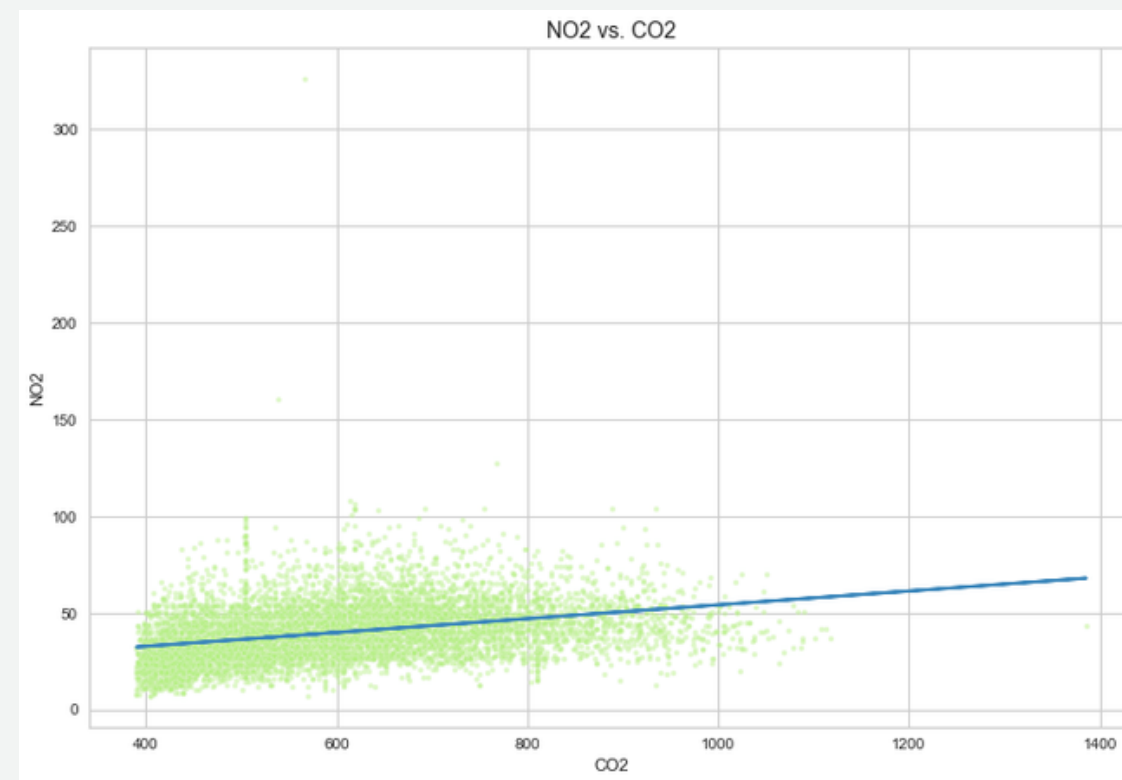
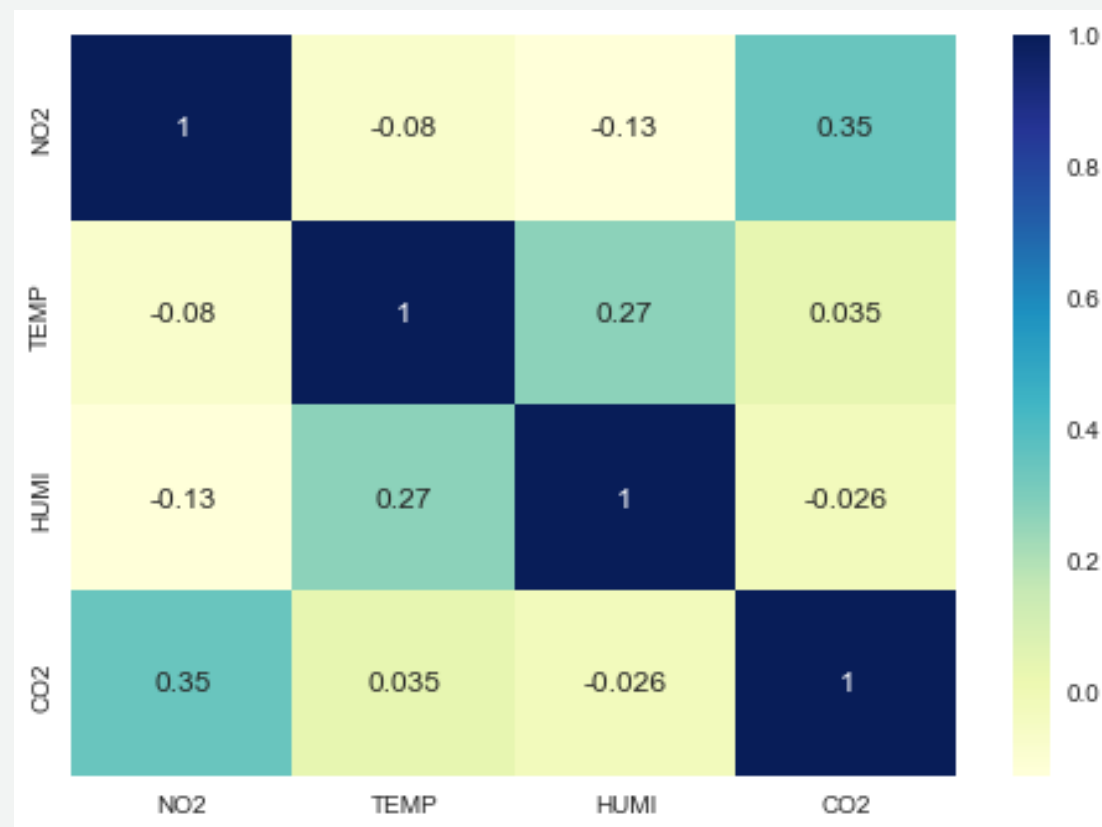
Mean squared error: 222.28
Root mean squared error: 14.91
Intercept: 39.97
R2 Score: 0.02



The Explained Variance: 0.02
The Mean Absolute Error: 11.37
The Median Absolute Error: 9.70

Linear Regression

Using CO2 now



Heatmap

Slope: `[[0.03566195]]`
Intercept: `[18.40550976]`
Mean squared error: `200.73`
Root mean squared error: `14.17`
R2 score: `0.11511227855230222`

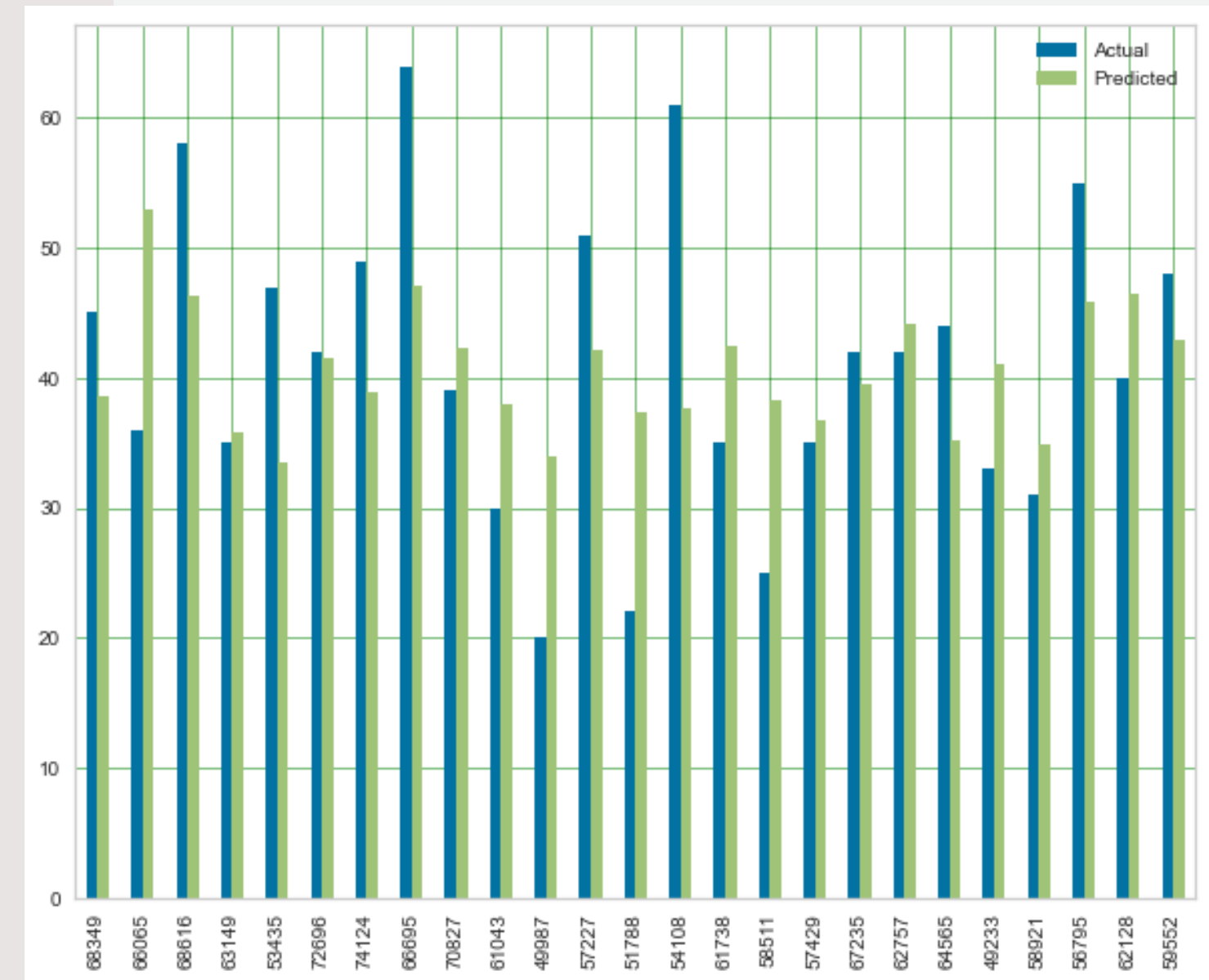
Predict NO/NO₂/PM₁₀ levels in a selected station from past values, temperature, humidity, and CO₂.

```
print(mse)
print(r2)
print(rmse)
```

```
192.60770055461018
0.13558657000941388
13.87831764136454
```

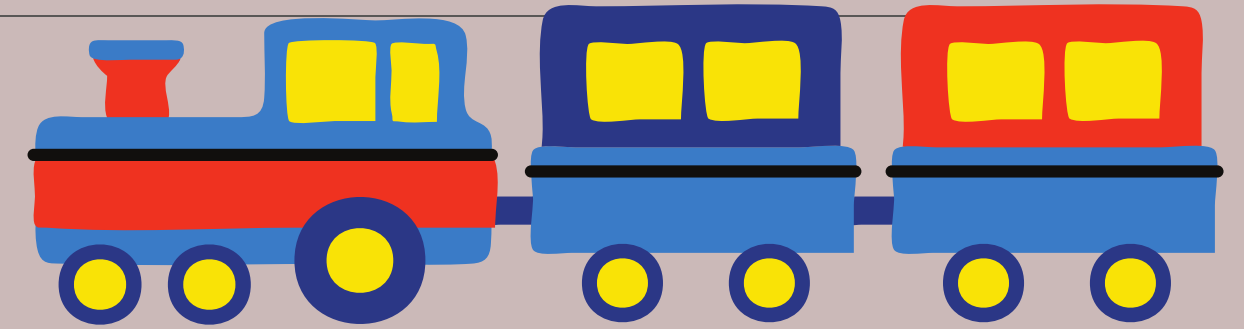
```
cross_validation(X_chatelet_no2_co2,Y_chatelet_no2_co2)
```

```
R_squared Mean Score: -0.02051225796606526
[-0.19839816 -0.02846629  0.07697044  0.0796446  -0.03231189]
```



The Explained Variance: 0.14
The Mean Absolute Error: 10.36
The Median Absolute Error: 8.44

Comparing models



Other models:

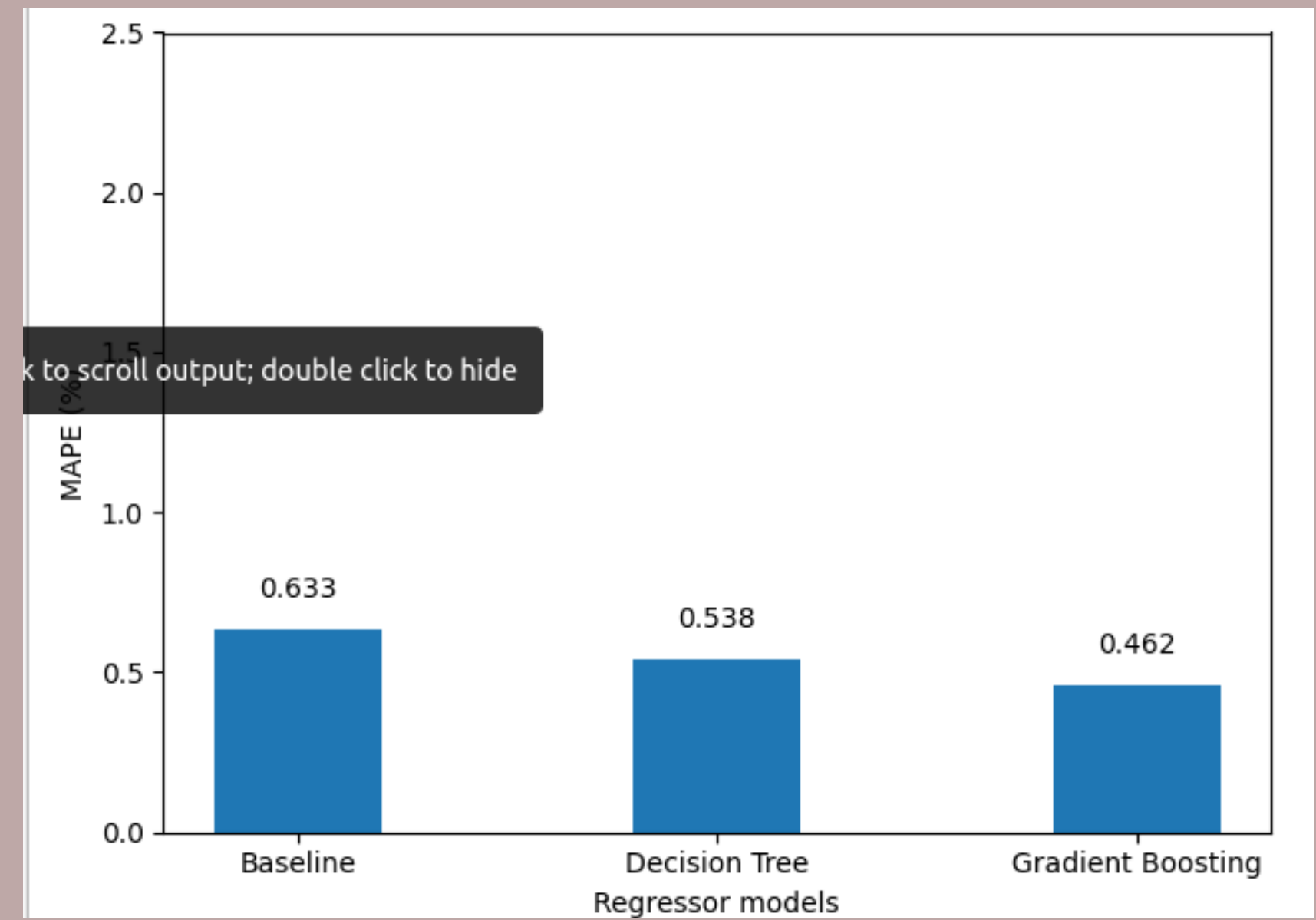
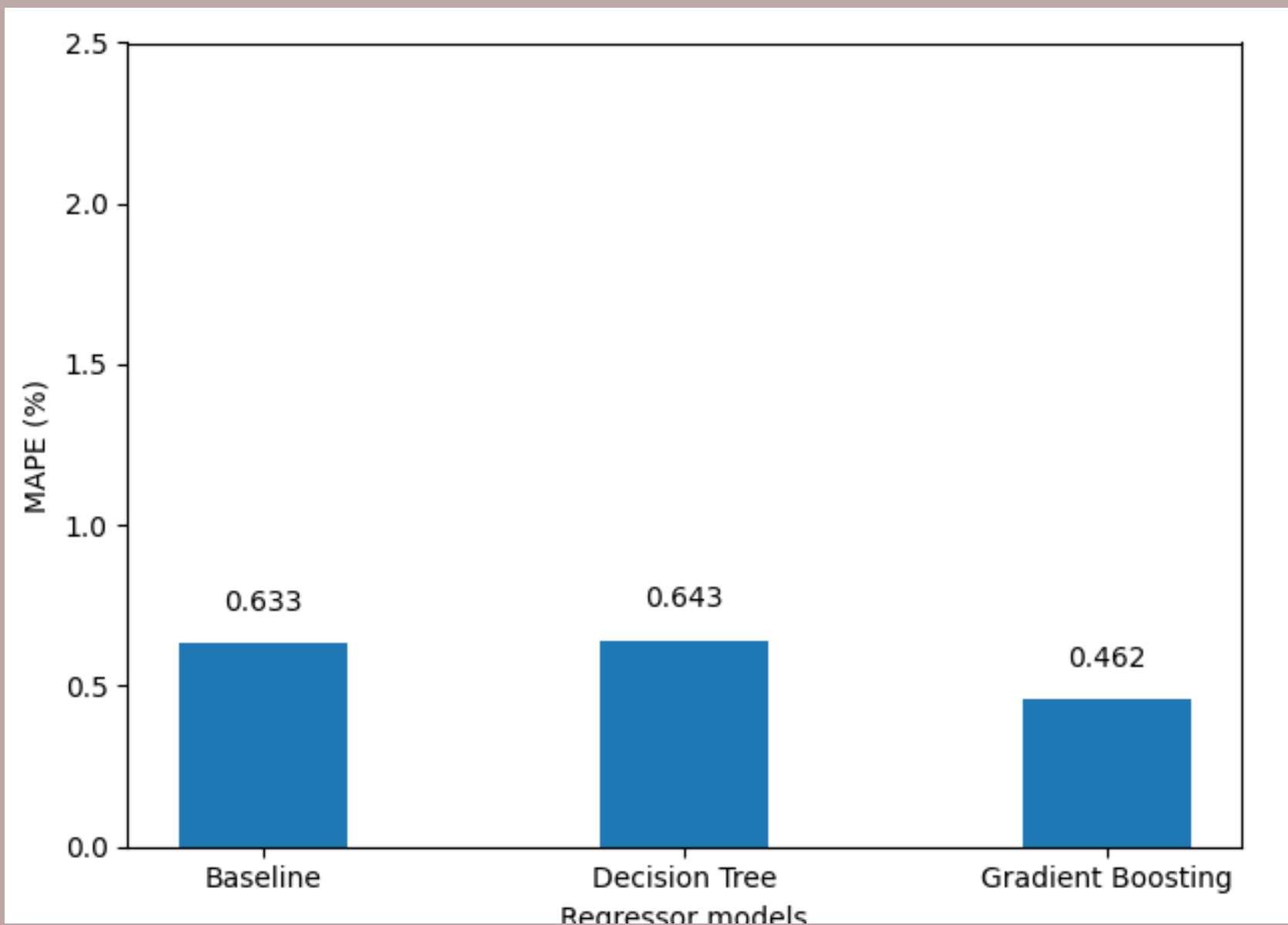
- Gradient boosting
- Decision Tree
- Baseline model

CO2	TEMP	HUMI	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	y
610.166667	19.712500	39.187500	612.041667	597.291667	550.208333	568.875000	513.333333	558.125000	610.500000	644.791667	640.958333	645.739130
599.833333	19.587500	38.445833	610.166667	612.041667	597.291667	550.208333	568.875000	513.333333	558.125000	610.500000	644.791667	640.958333
500.000000	18.375000	37.145833	599.833333	610.166667	612.041667	597.291667	550.208333	568.875000	513.333333	558.125000	610.500000	644.791667
532.958333	17.087500	30.562500	500.000000	599.833333	610.166667	612.041667	597.291667	550.208333	568.875000	513.333333	558.125000	610.500000
517.666667	17.212500	35.891667	532.958333	500.000000	599.833333	610.166667	612.041667	597.291667	550.208333	568.875000	513.333333	558.125000
...
576.541667	17.104167	40.616667	547.791667	483.041667	532.666667	605.458333	605.958333	561.791667	569.000000	550.625000	549.375000	616.916667
589.041667	16.754167	38.708333	576.541667	547.791667	483.041667	532.666667	605.458333	605.958333	561.791667	569.000000	550.625000	549.375000
620.541667	16.075000	37.383333	589.041667	576.541667	547.791667	483.041667	532.666667	605.458333	605.958333	561.791667	569.000000	550.625000
671.916667	15.487500	37.483333	620.541667	589.041667	576.541667	547.791667	483.041667	532.666667	605.458333	605.958333	561.791667	569.000000
535.000000	14.900000	34.400000	671.916667	620.541667	589.041667	576.541667	547.791667	483.041667	532.666667	605.458333	605.958333	561.791667

Comparing models

-CHATELET-

mean absolute percentage error (MAPE)



Thank you for
your attention!

