

# Math6450\_Assignment3

October 13, 2025

Task as Hand: Your task is to use this data to model the AQI of Weber County on a daily, weekly, or monthly basis. If you choose to aggregate the data into weekly or monthly values, you must justify the reason for doing so.

I will remove this sections, and the section headers instructions...

## 1 Exploratory Data Analysis (EDA):

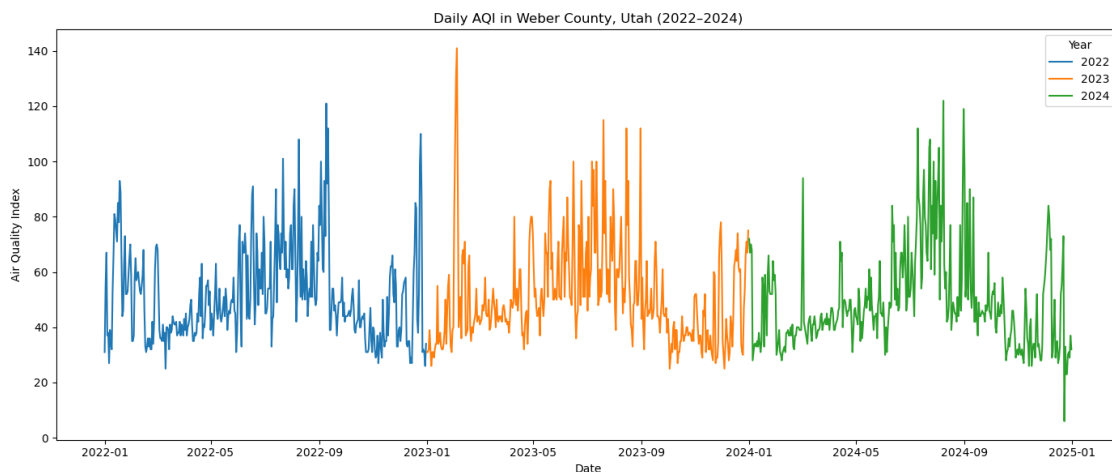
Provide insights into the dataset based on your initial analysis.

Check for missing/na values:

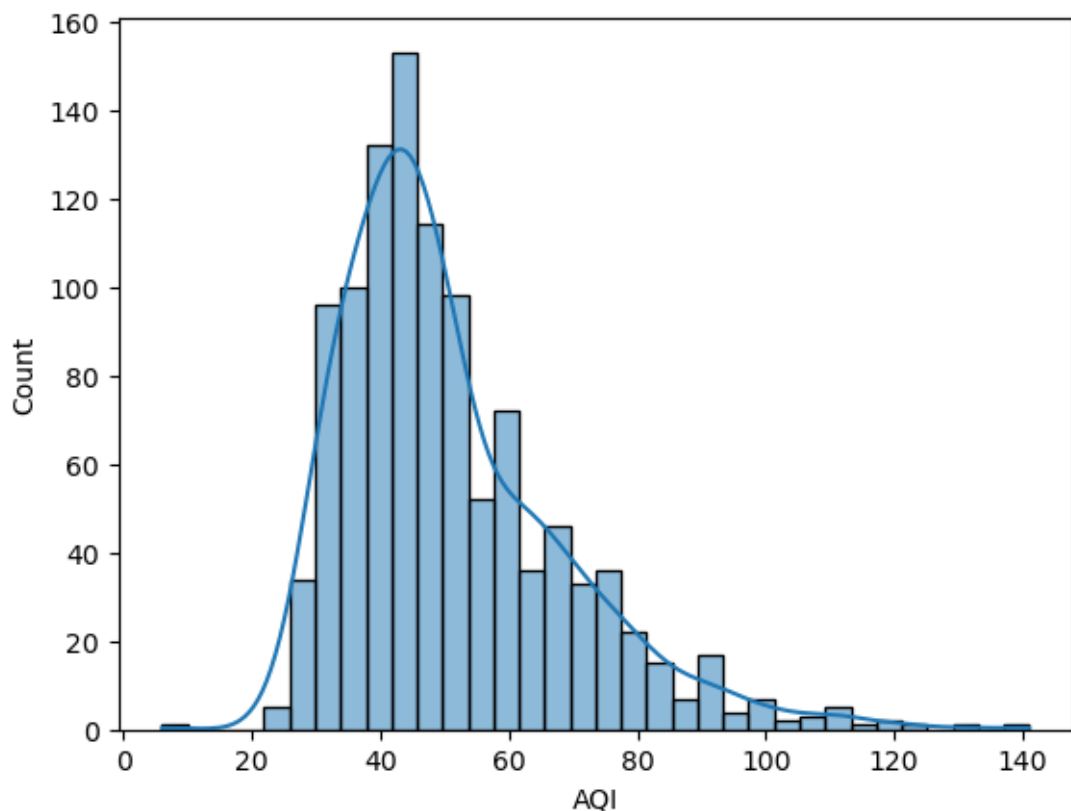
AQI 0

Year 0

dtype: int64



There is a pattern each year showing that there is some seasonlity or trends in AQI.



## 2 Reason for Aggregation (if applicable):

Explain why you chose to aggregate the data (or not), and describe how you performed this aggregation if it applies.

## 3 Transformations:

Discuss whether you applied any transformations (e.g., log, square root) to the data and why, or explain why no transformation was needed.

## 4 Seasonal Patterns:

Identify any seasonal patterns in the AQI data. If no seasonality is present, provide visualizations to support this conclusion.

## 5 Autocorrelation:

Analyze significant autocorrelations in the data and explain any patterns observed in the lag values.

Correlation Coefficients:

Calculate correlation coefficients for selected lag values and provide scatter plots to visualize these relationships.

Data Splitting:

Split the data, using the last 12 values for model testing.

Model Selection:

Try different models and describe the criteria used to select your final model.

Model Parameters and Diagnostics:

Explain the statistical significance of the model parameters and any diagnostic tests performed to validate the model.

Final Model Equation:

Present the equation of your final model.

Forecasting:

Forecast the AQI for the last 12 values, including confidence intervals.

Model Performance:

Compute the error of the model's performance on the test data.

Conclusion:

Summarize your findings and reflect on the forecasting accuracy and the AQI trends observed.