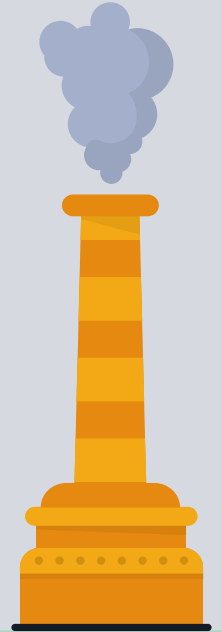
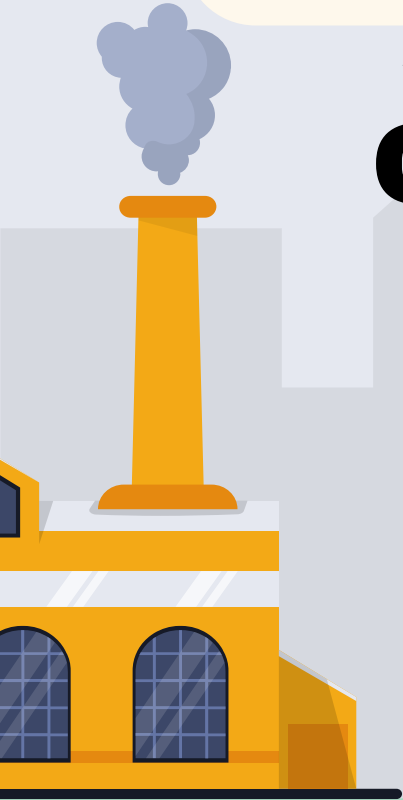


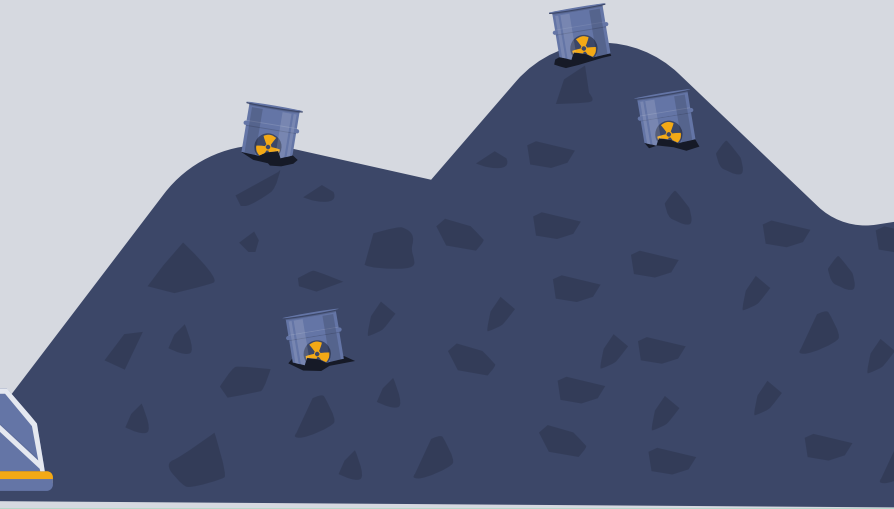
# **An Analysis of Air Quality in 10 Major US Cities**

Grant Lange, Erick Adame,  
Joshua Cross, Xiao Li



# Questions

- If I am prone to respiratory illness what major city should I live in?
- Is there a seasonal pattern to the air quality in the two biggest major cities in 2022?
- Can we identify a geographical pattern to air quality across the country?



# Our Data

- We gathered our data using the air pollution API from OpenWeatherMap.org.
- OpenWeatherMap offers historical Air Quality Index Values starting with November 2020.
  - Study restricted to 2021, 2022
- Air quality is measured in 1 hour timesteps.



# Major Cities Based on Population



1. New York City, NY
2. Los Angeles, CA
3. Chicago, IL
4. Houston, TX
5. Phoenix, AZ
6. Philadelphia, PA
7. San Antonio, TX
8. San Diego, CA
9. Dallas, TX
10. San Jose, CA

The background features a light blue sky with three yellow clouds. A grey mountain peak is visible behind the central text. At the bottom, there is a green ground line. On the left, a yellow cooling tower with a white circle and a grey smokestack with a grey grid pattern are shown. On the right, another yellow cooling tower with a white circle is shown. Both towers emit grey smoke.

10 Major Cities, Data Every Hour, 2 Years of Data

**175,000**

Points of AQI Data Collected

# Challenges



**Time  
Conversion**



**Data was  
hourly**



**Graphing  
columns of data  
points**



# What is Air Quality Index (AQI)

Qualitative name	Index or sub-index	Pollutant (hourly) concentration in $\mu\text{g}/\text{m}^3$			
		$\text{NO}_2$	$\text{PM}_{10}$	$\text{O}_3$	$\text{PM}_{2.5}(\text{optional})$
Very low	0–25	0–50	0–25	0–60	0–15
Low	25–50	50–100	25–50	60–120	15–30
Medium	50–75	100–200	50–90	120–180	30–55
High	75–100	200–400	90–180	180–240	55–110
Very high	>100	>400	>180	>240	>110

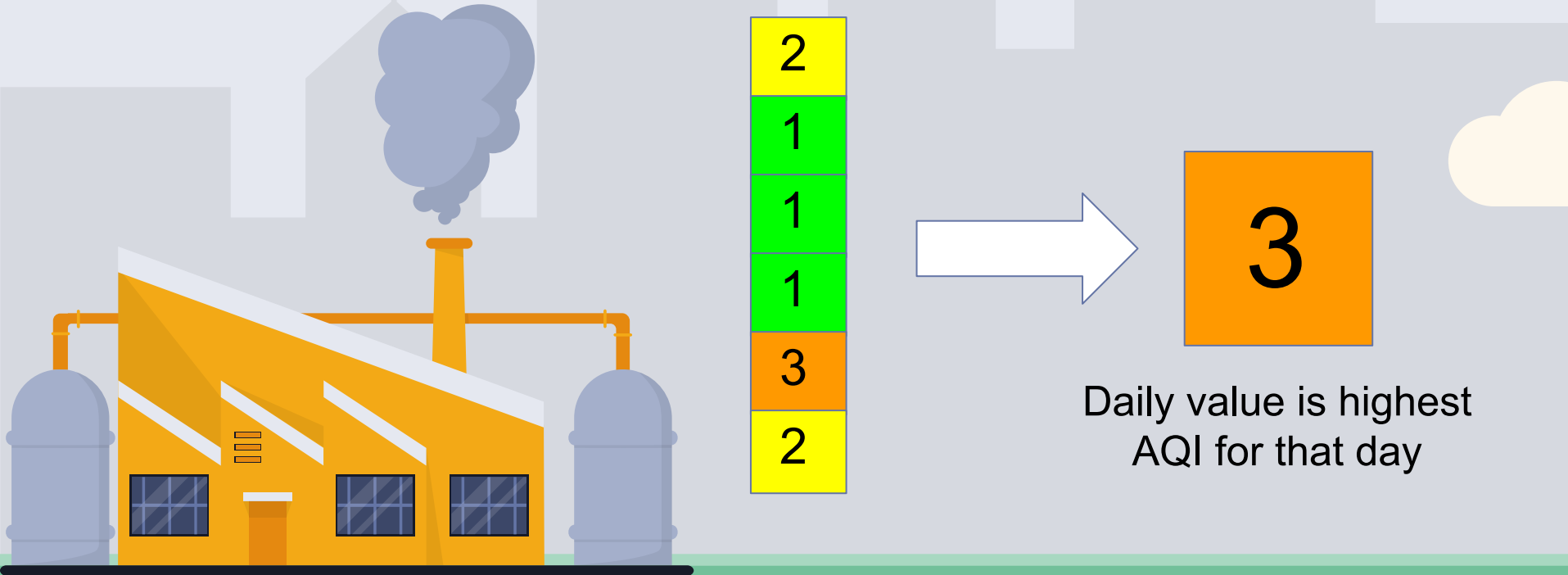
# What is Air Quality Index (AQI)

## United States (AQI)





How did we get to the AQI rating for each day?

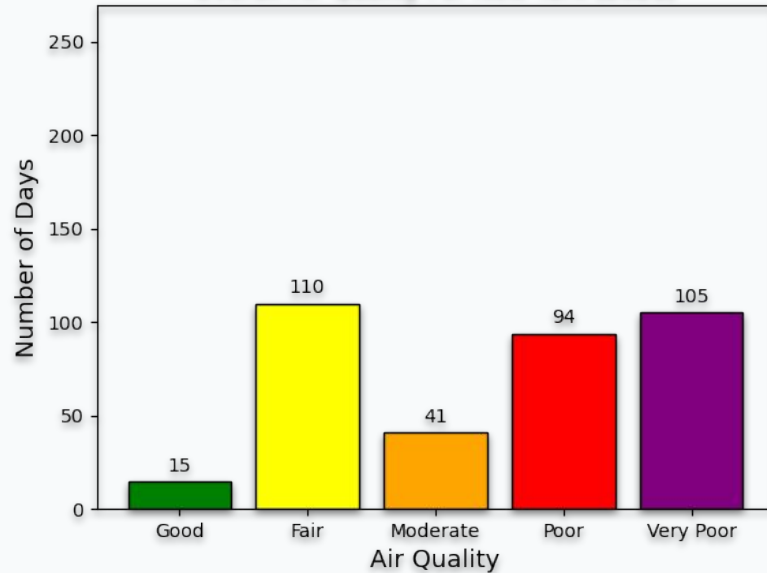




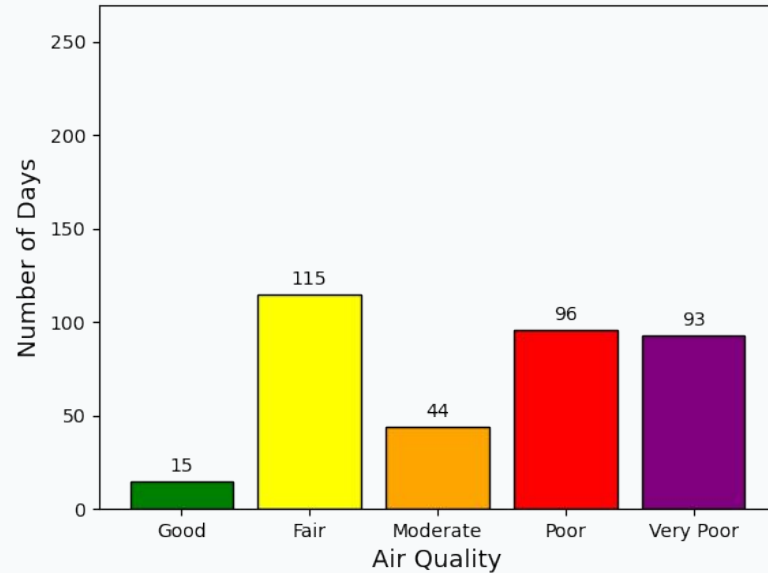
**Let's look at our data...**

# New York

Overall Air Quality For New York (2021)

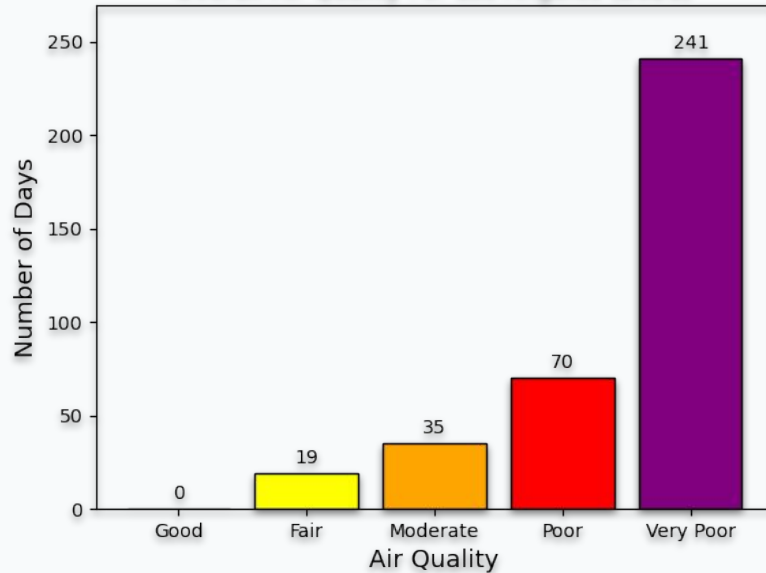


Overall Air Quality For New York (2022)

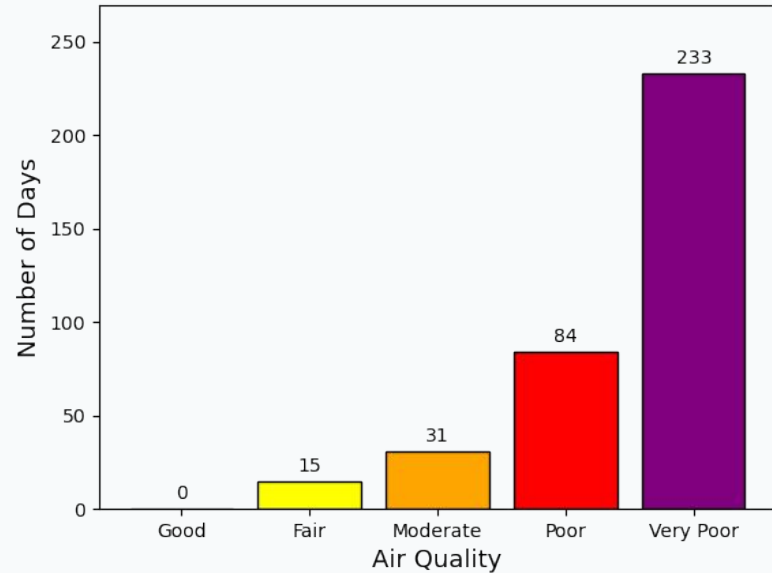


# Los Angeles

Overall Air Quality For Los Angeles (2021)

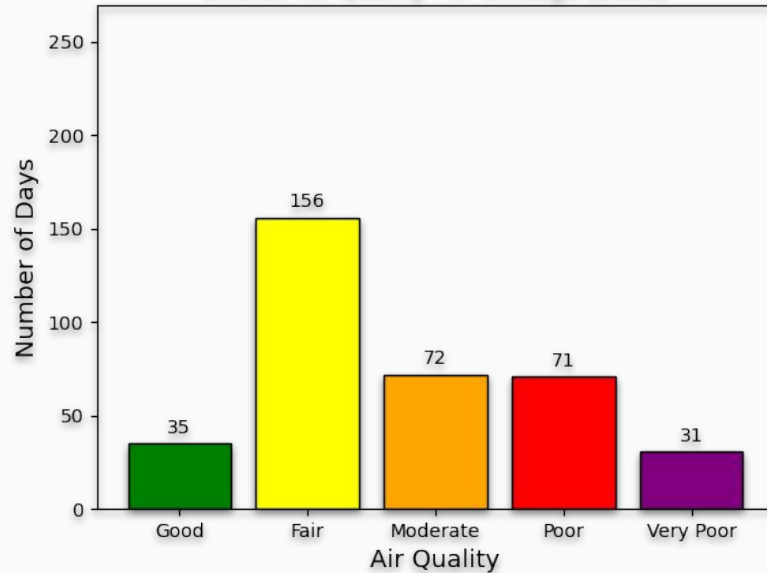


Overall Air Quality For Los Angeles (2022)

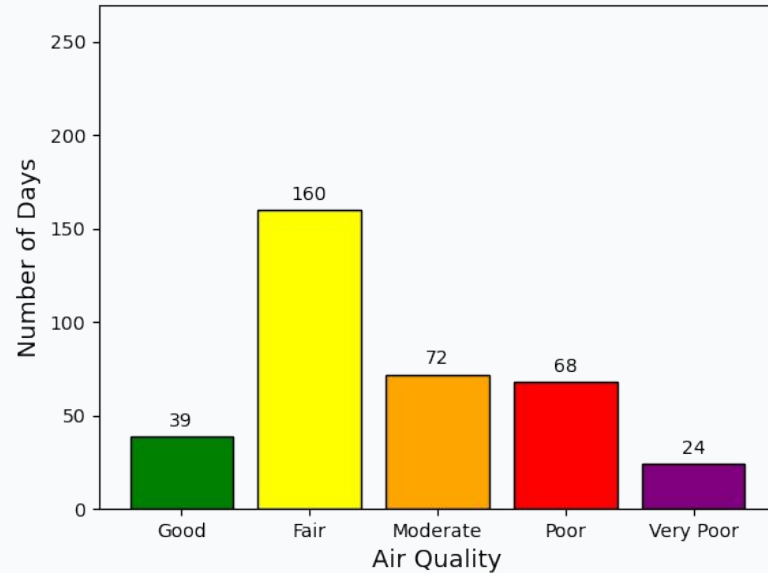


# Chicago

Overall Air Quality For Chicago (2021)

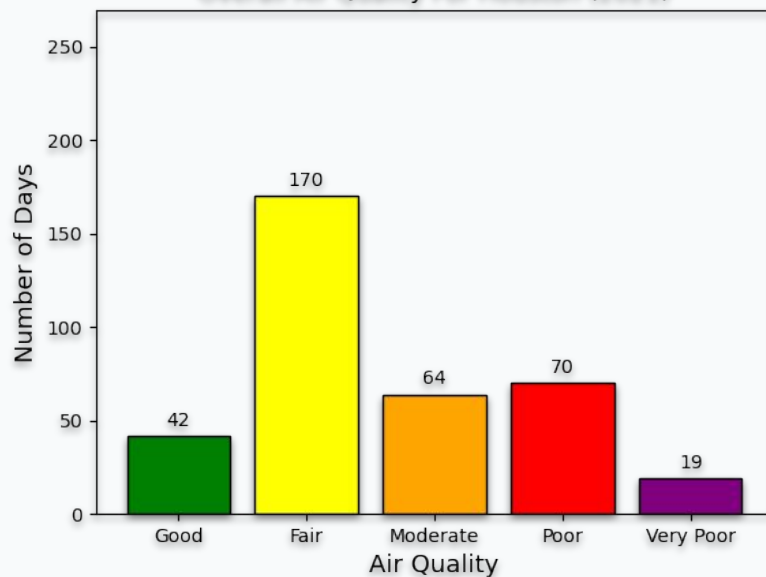


Overall Air Quality For Chicago (2022)

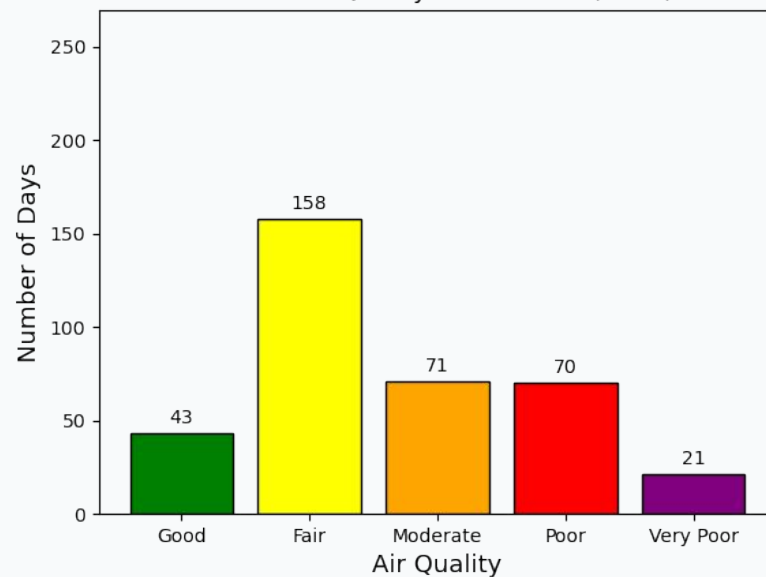


# Houston

Overall Air Quality For Houston (2021)

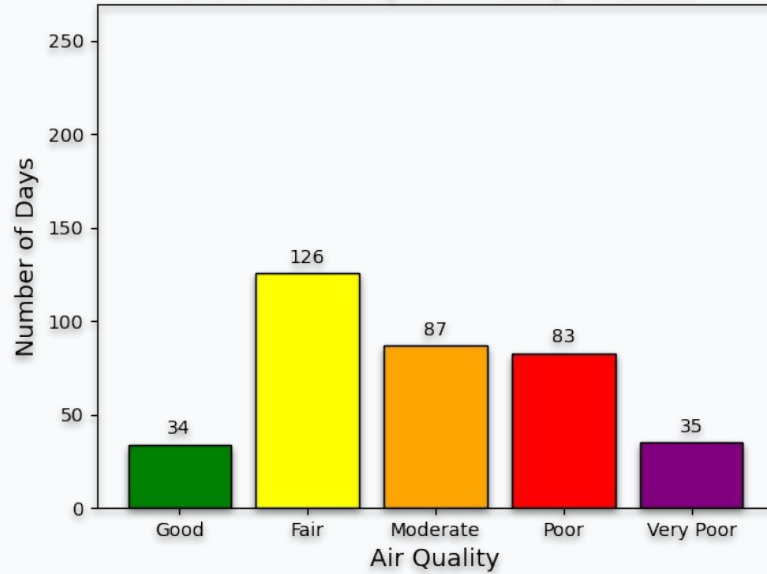


Overall Air Quality For Houston (2022)

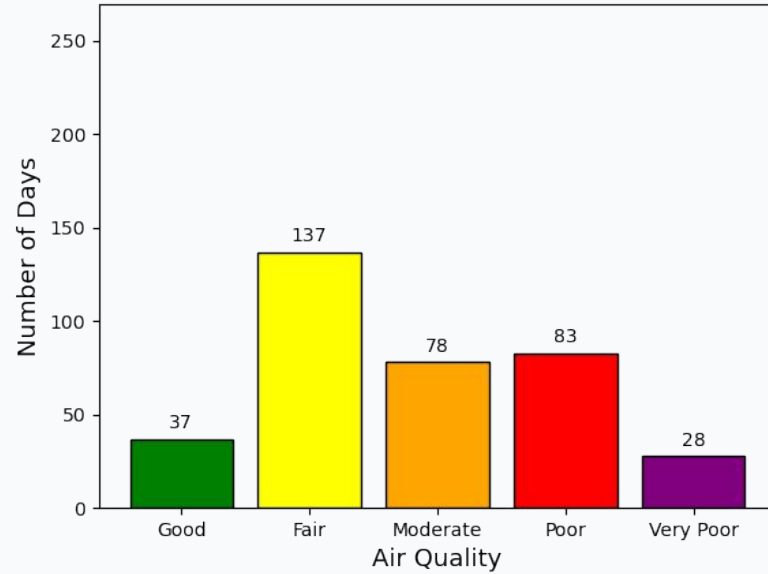


# Philadelphia

Overall Air Quality For Philadelphia (2021)



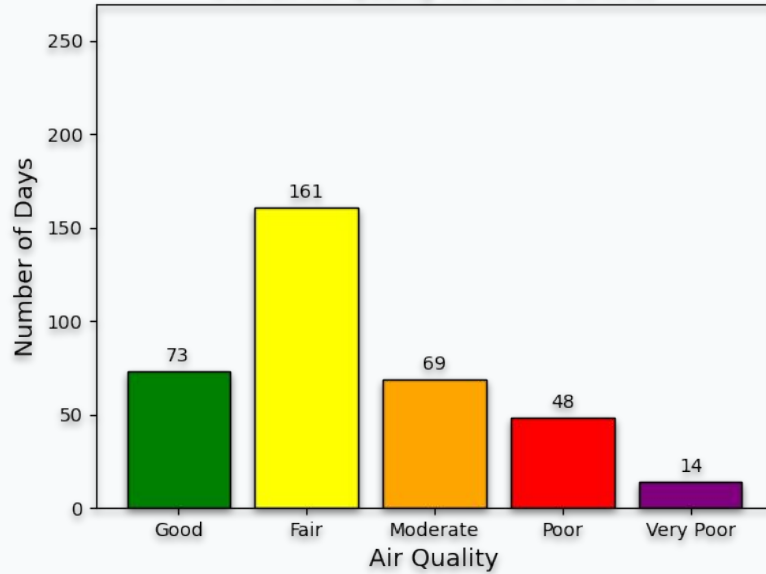
Overall Air Quality For Philadelphia (2022)



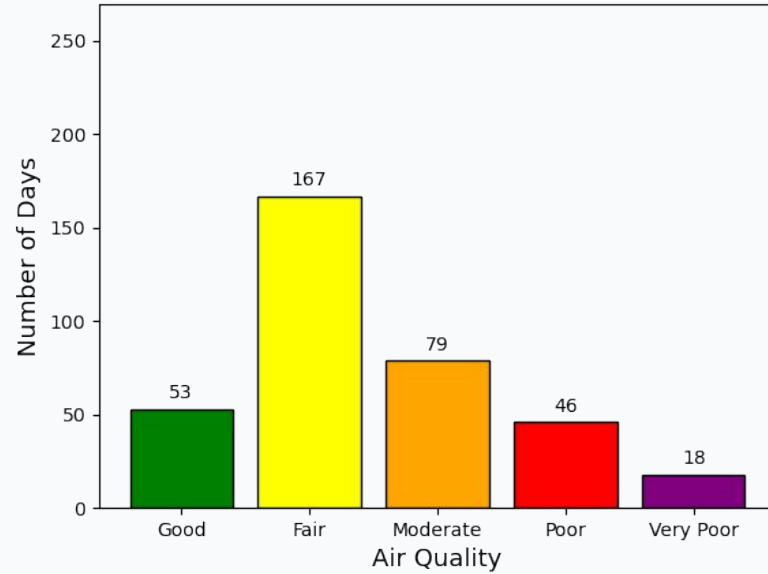
# Dallas



Overall Air Quality For Dallas (2021)



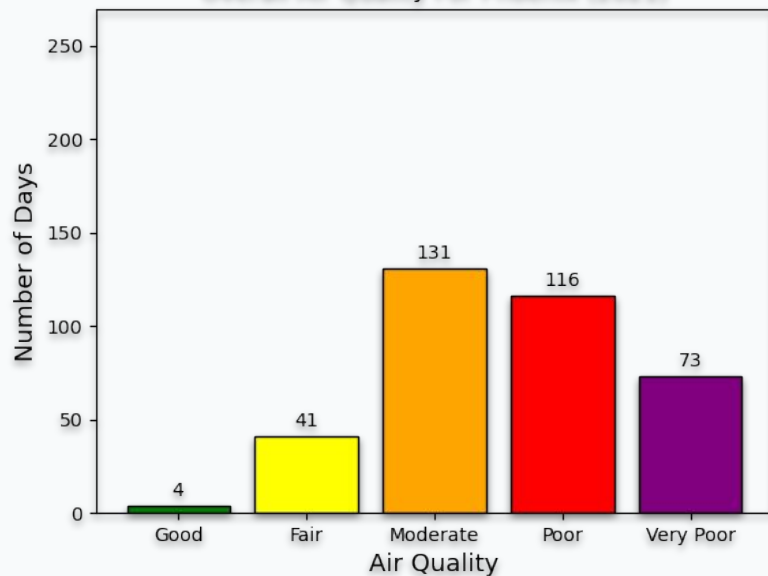
Overall Air Quality For Dallas (2022)



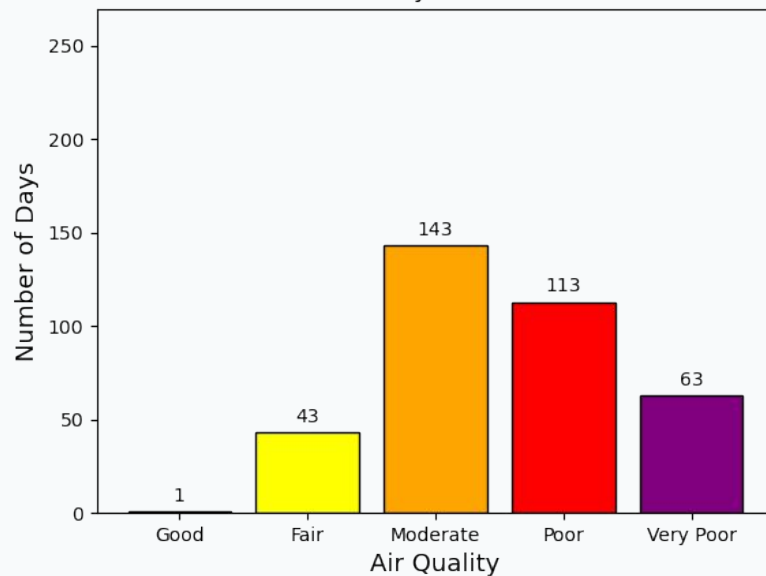


# Phoenix

Overall Air Quality For Phoenix (2021)

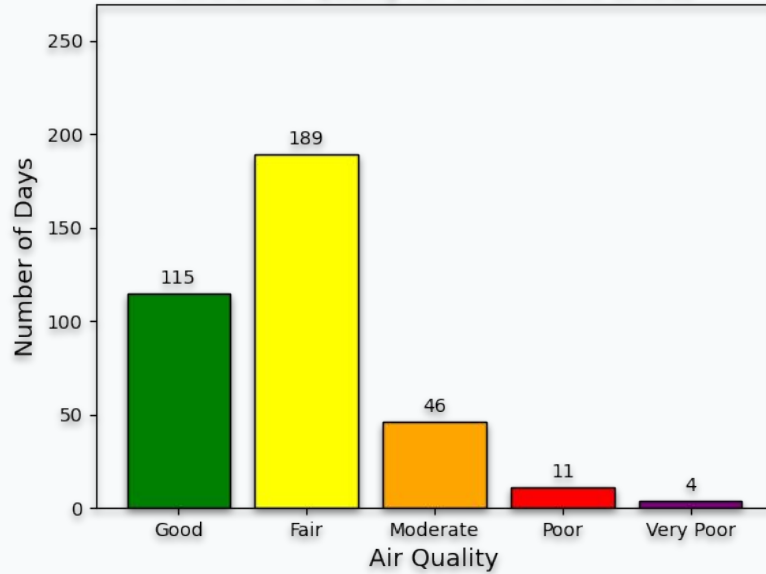


Overall Air Quality For Phoenix (2022)

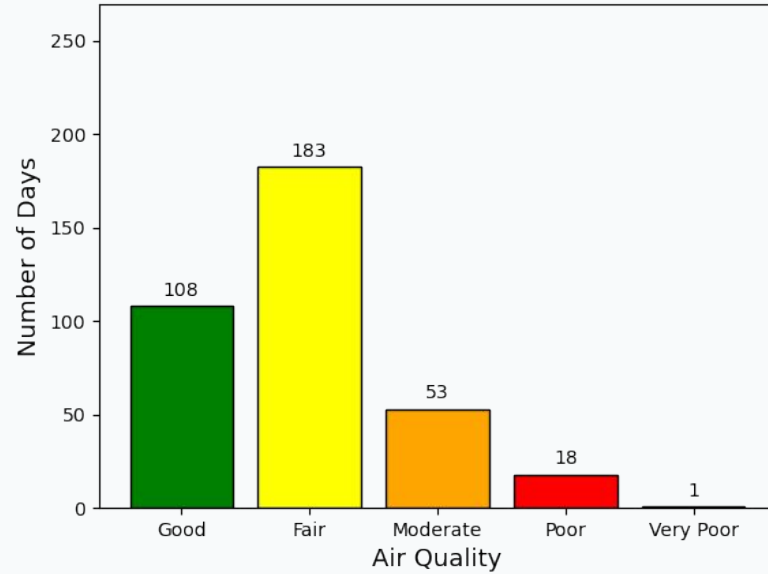


# San Antonio

Overall Air Quality For San Antonio (2021)

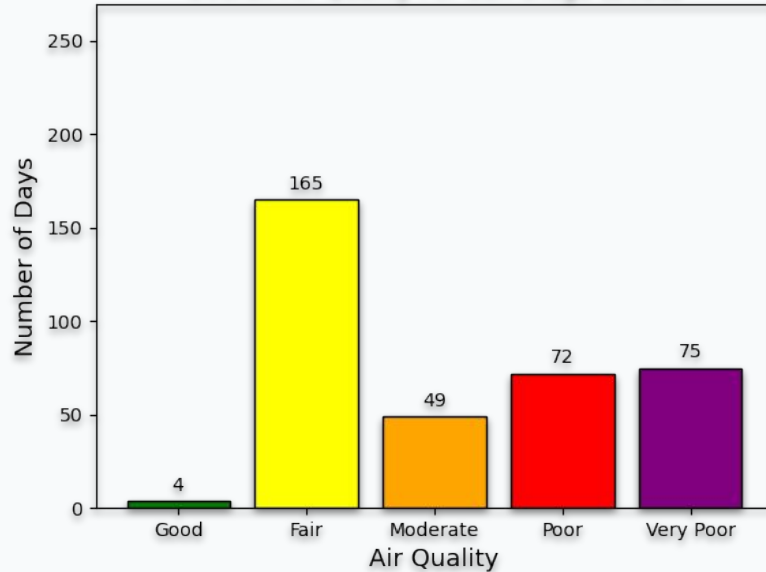


Overall Air Quality For San Antonio (2022)

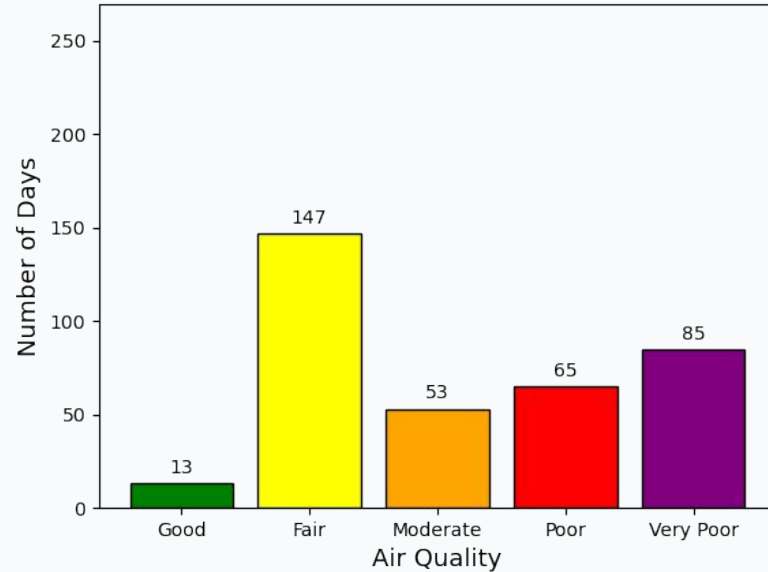


# San Diego

Overall Air Quality For San Diego (2021)

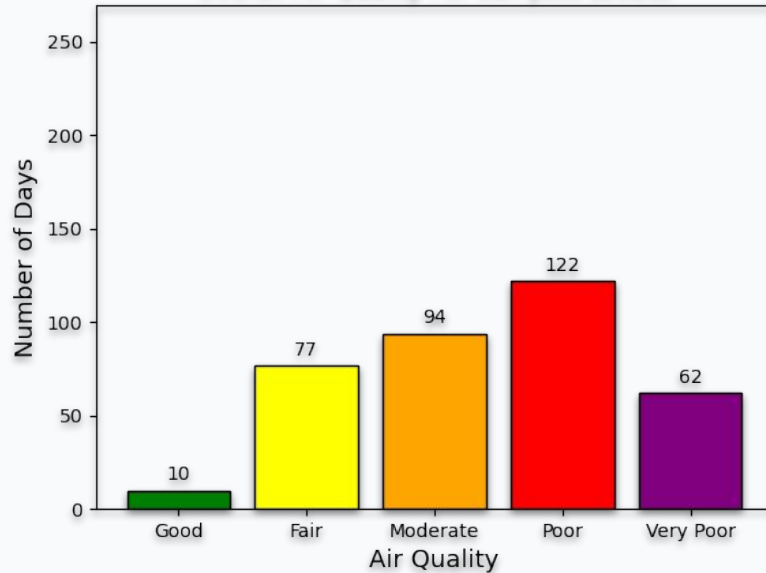


Overall Air Quality For San Diego (2022)

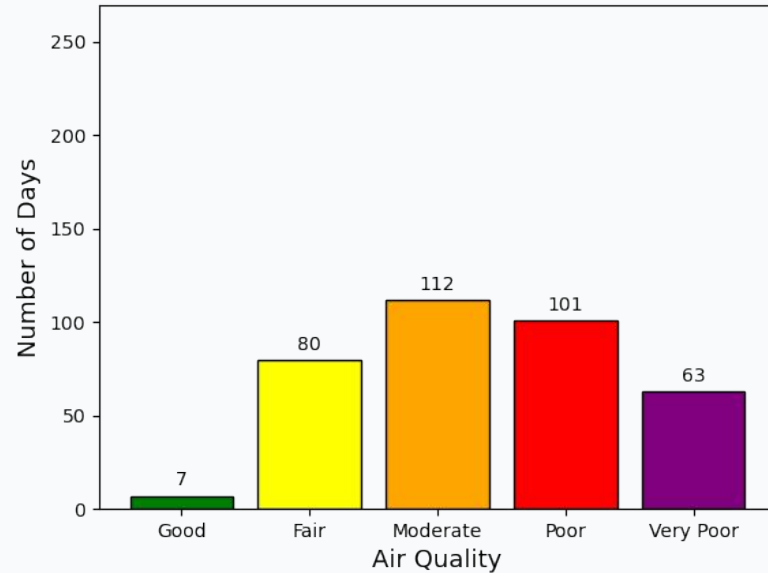


# San Jose

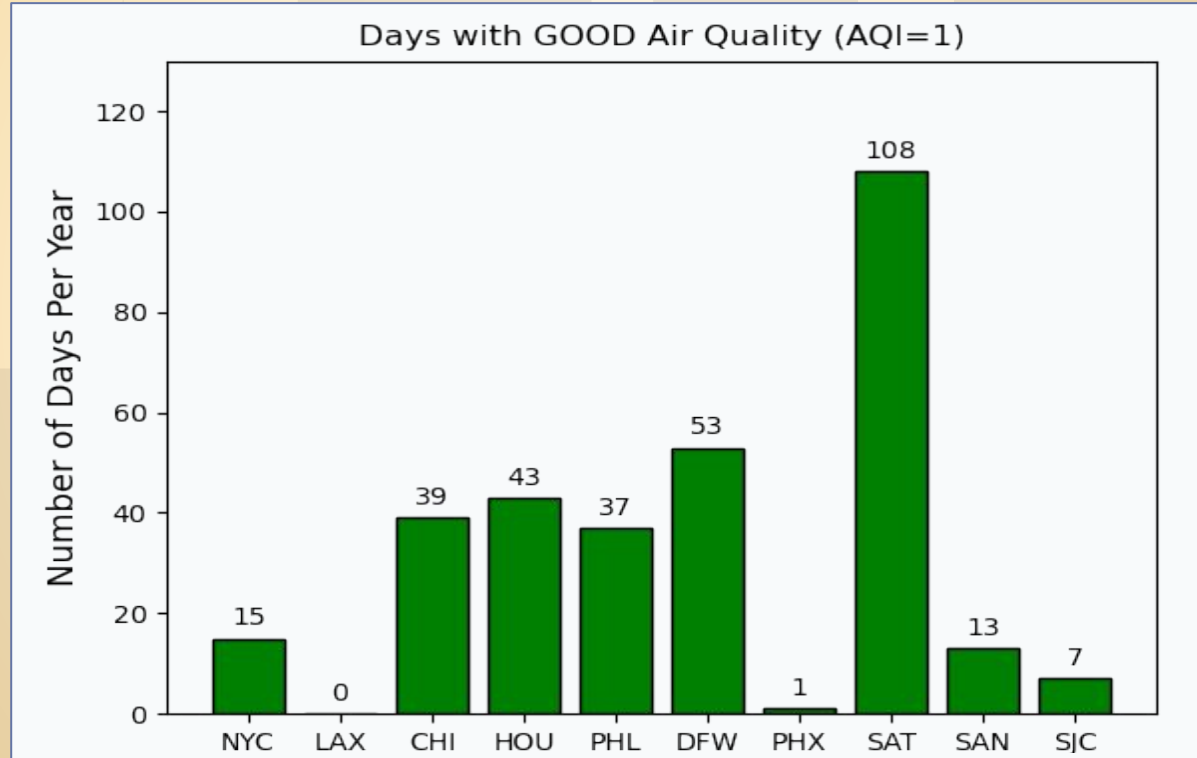
Overall Air Quality For San Jose (2021)



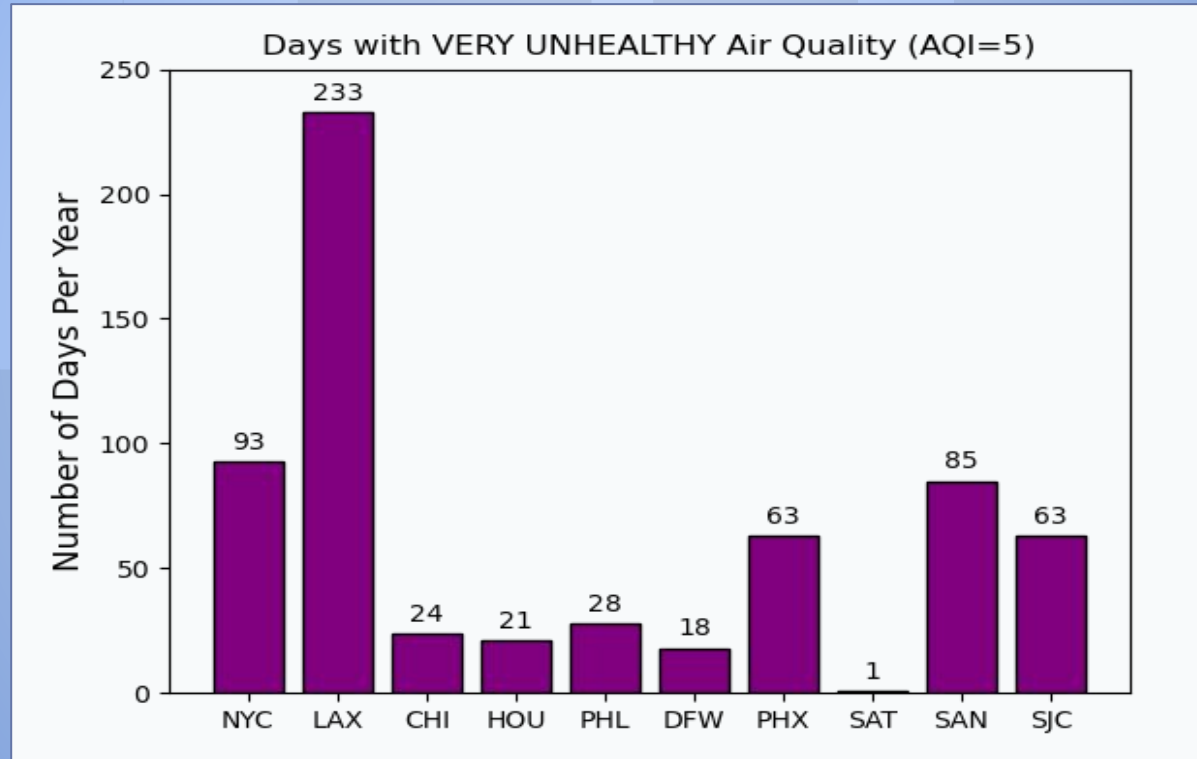
Overall Air Quality For San Jose (2022)



# Best Air Quality (2022)



# Worst Air Quality (2022)



# Cities Ranked By Number of Good Air Quality Days

1. San Antonio - 108

2. Dallas - 53

3. Houston - 43

4. Chicago - 39

5. Philadelphia - 37

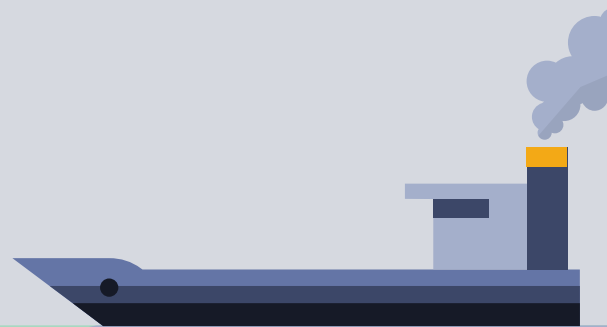
6. New York City - 15

7. San Diego - 13

8. San Jose - 7

9. Phoenix - 1

10. Los Angeles - 0



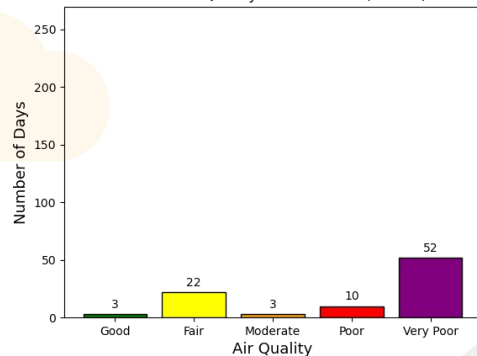
A stylized background illustration featuring a city skyline with several grey buildings of varying heights. Five yellow, fluffy clouds are scattered across the light blue sky. A solid green horizontal bar at the bottom represents the ground.

# Seasonal Patterns?

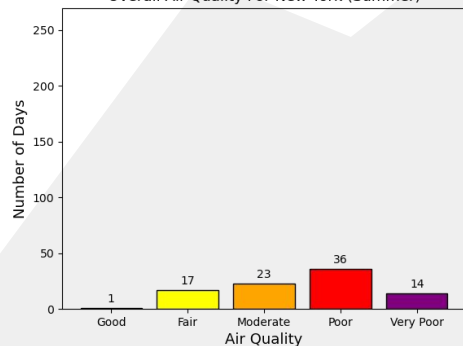


# New York Seasonal 2022

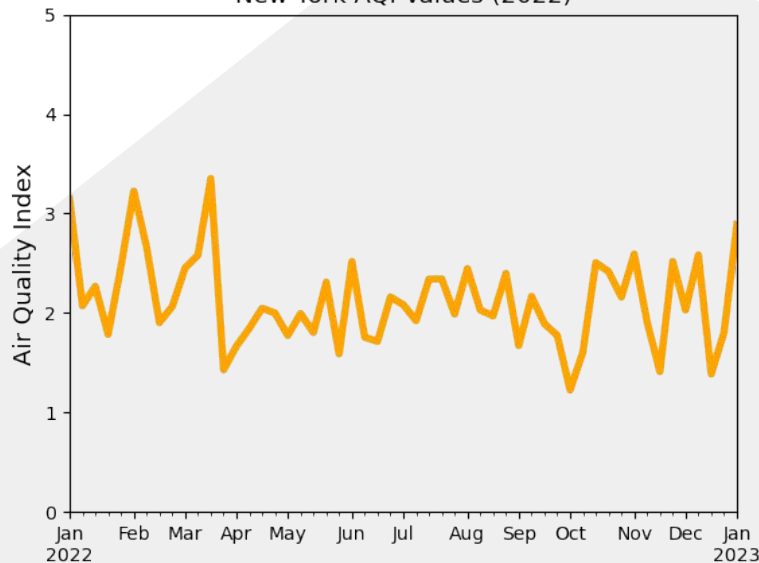
Overall Air Quality For New York (Winter)



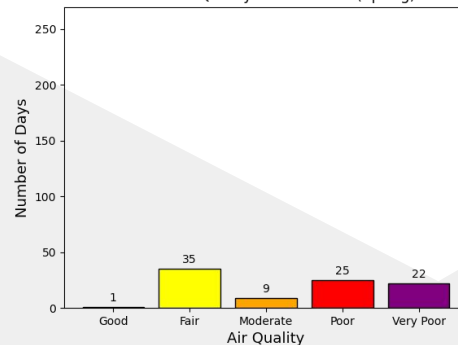
Overall Air Quality For New York (Summer)



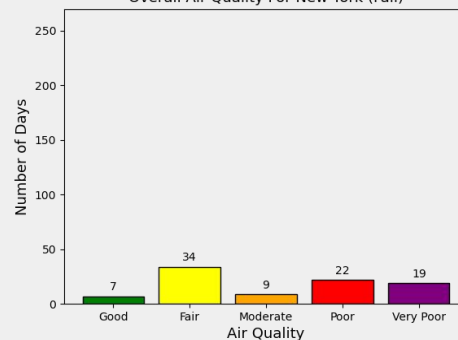
New York AQI Values (2022)



Overall Air Quality For New York (Spring)

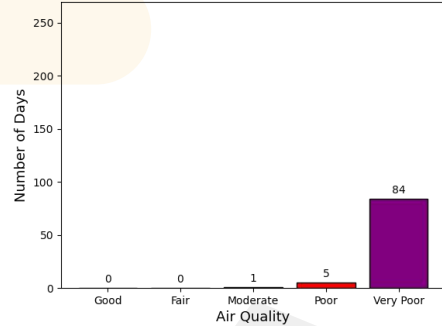


Overall Air Quality For New York (Fall)

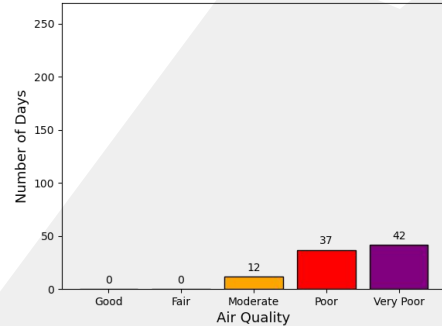


# Los Angeles Seasonal 2022

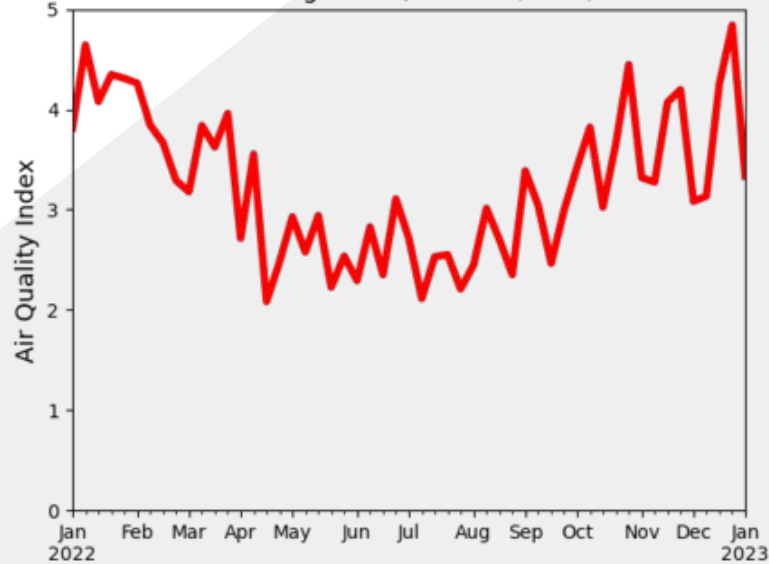
Overall Air Quality For Los Angeles (Winter)



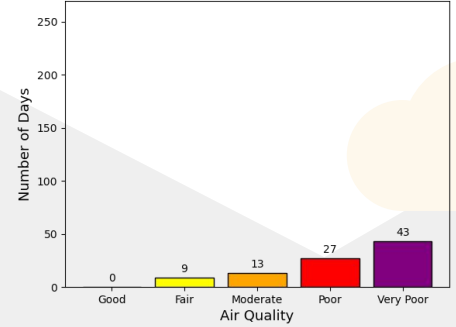
Overall Air Quality For Los Angeles (Summer)



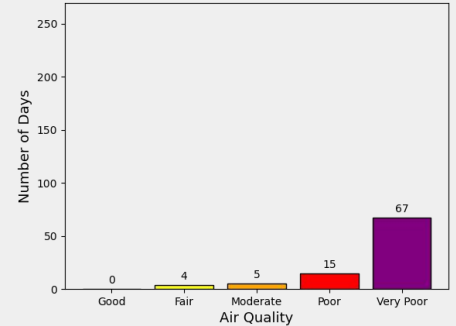
Los Angeles AQI Values (2022)



Overall Air Quality For Los Angeles (Spring)



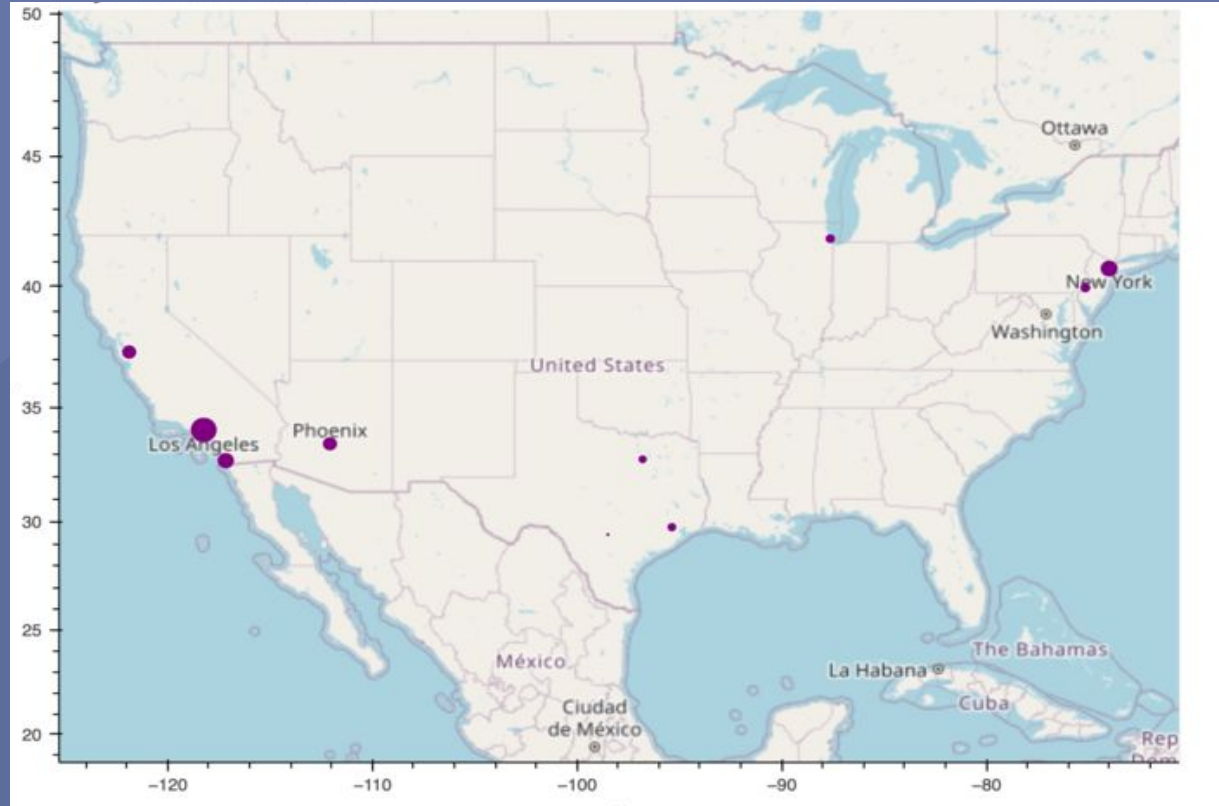
Overall Air Quality For Los Angeles (Fall)



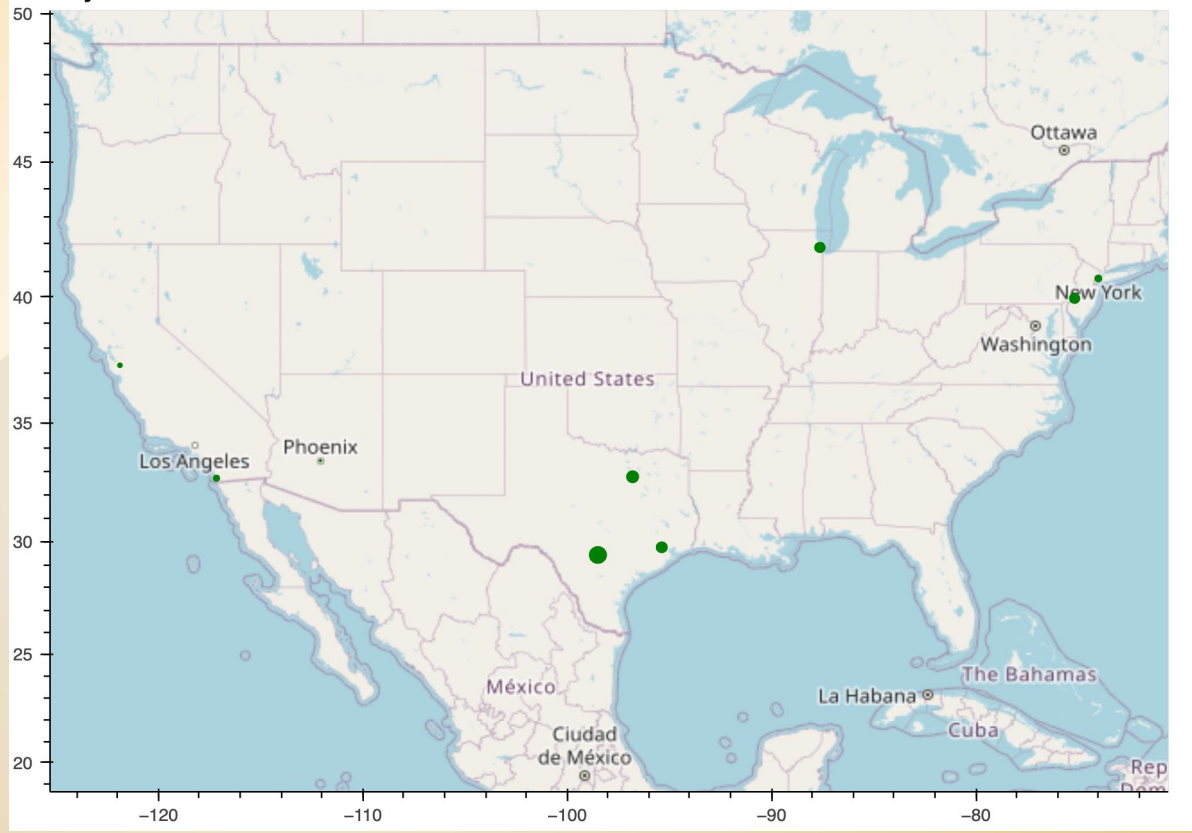
# Geographical Patterns



# Days with VERY UNHEALTHY Air Quality



# Days with GOOD Air Quality!



# Summary

- San Antonio has the best air quality for major cities.
- New York City does not have a noticeable seasonal pattern, but Los Angeles' air is “cleanest” from mid-spring to early fall.
- The east and west coast of the USA have the worst air quality and the cleanest air is in the central area

The background features a stylized industrial scene. On the left, a yellow factory building with two windows and a tall smokestack emitting a large grey cloud of smoke. A blue cylindrical tank is connected to the factory by a yellow pipe. On the right, a yellow cooling tower with a blue and white radiation symbol on its side, emitting a grey smoke cloud. Next to it is a smaller blue building with a smokestack. The background is composed of several grey rectangular shapes of varying heights, resembling a city skyline. Three yellow clouds are scattered across the top. The entire scene is set against a light blue background with a green ground line at the bottom.

# The End

QUESTIONS???

**CREDITS:** This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by **Freepik**