SIDDHI SUBHEDAR 1262240621 [POWER BI DASHBOARD]

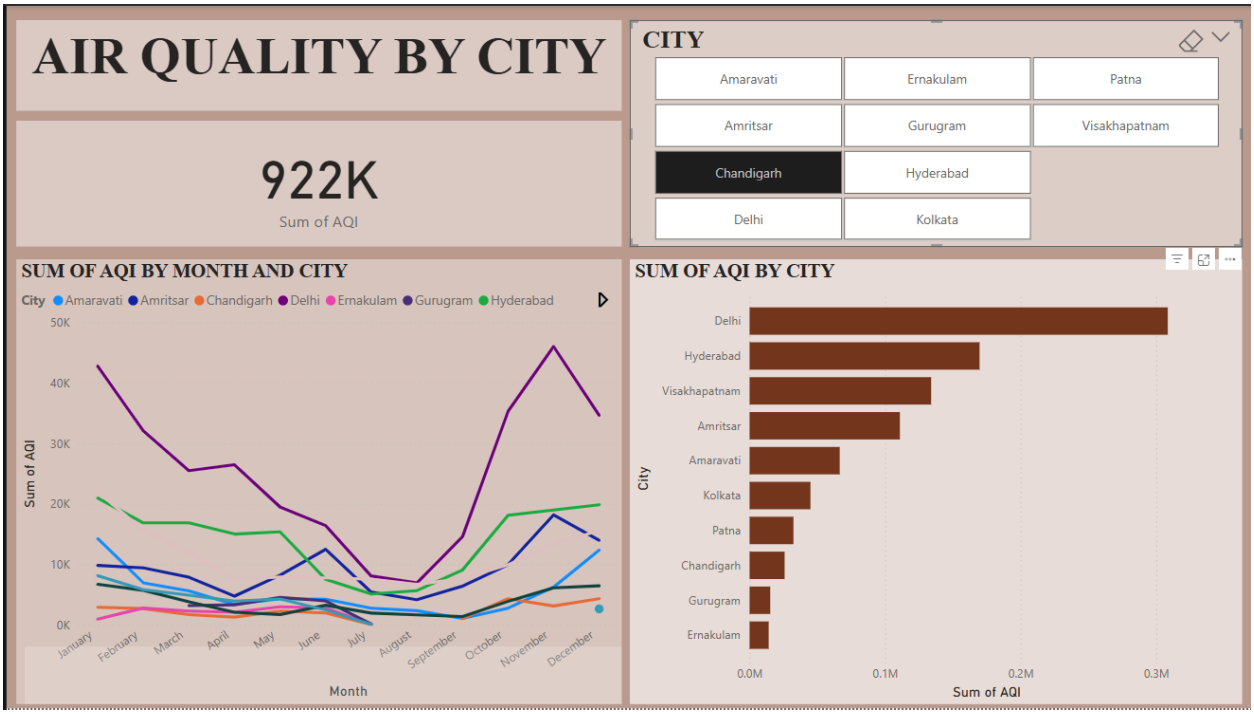
Set 11: Hourly Data Analysis, Data Cleaning, and Dashboard Creation

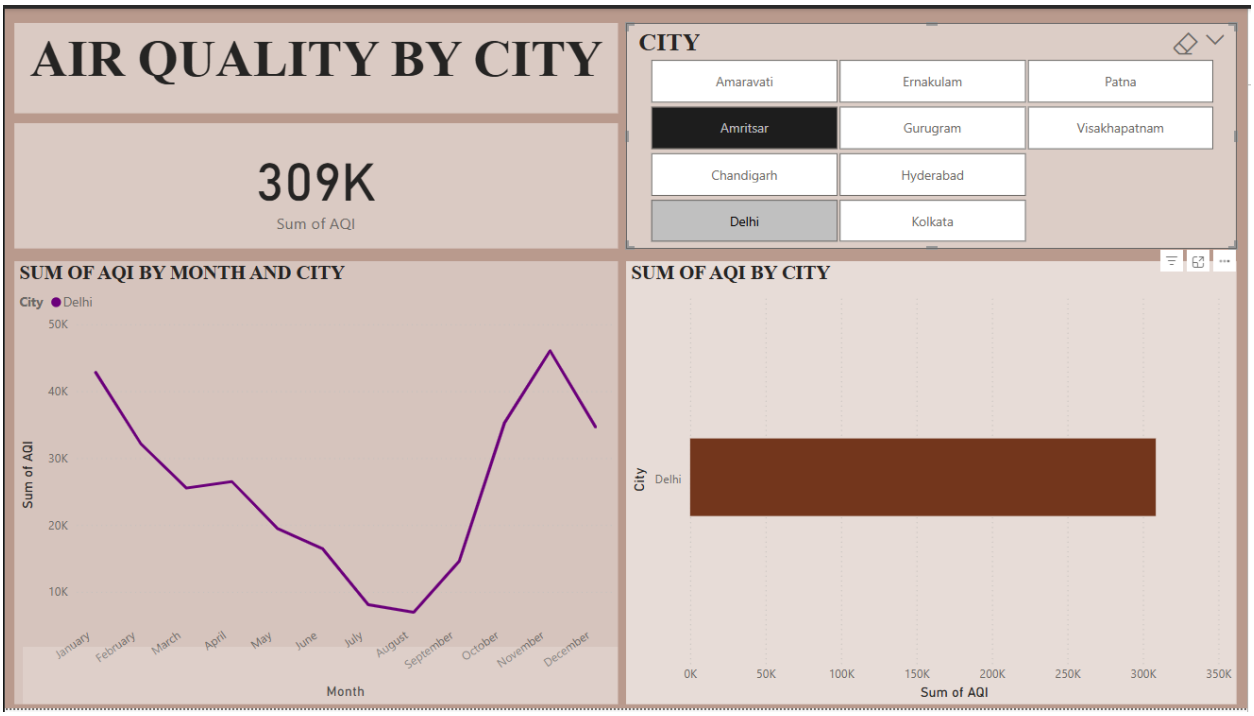
Question 6: You need to work with hourly air quality data to identify patterns and visualize the findings in a dashboard.

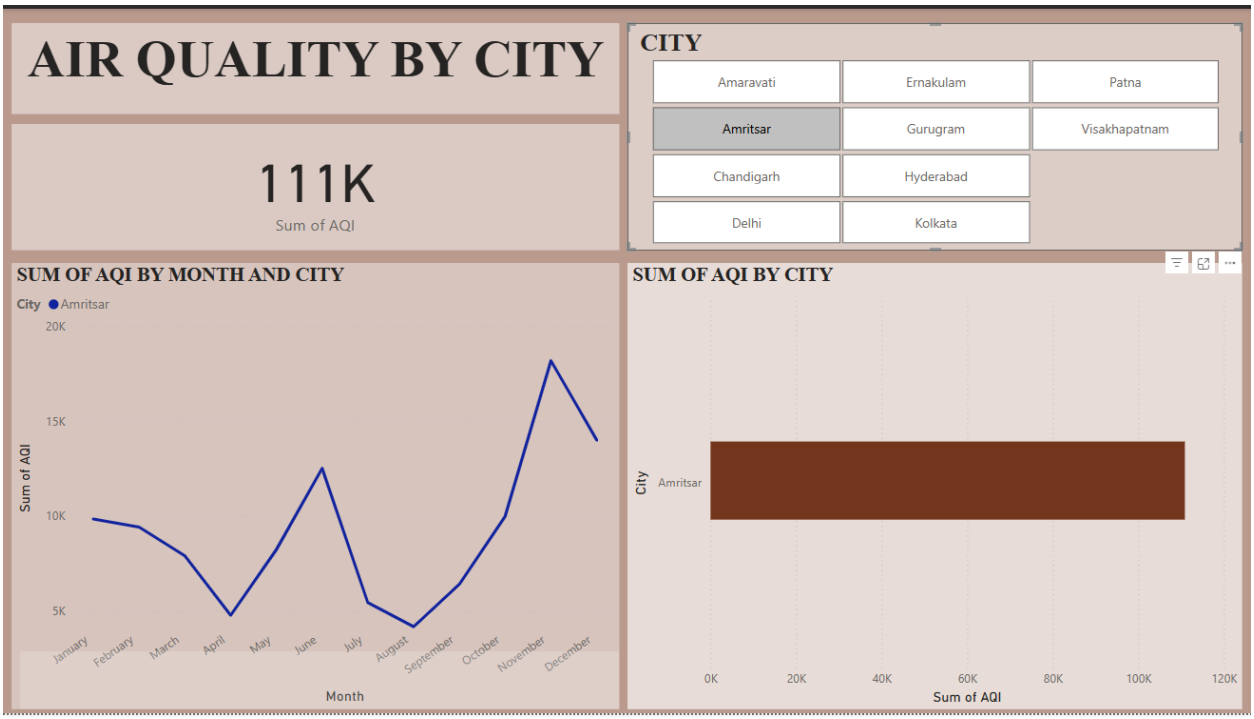
- **Part A**: Import the Air Quality Data into Power BI and clean the dataset by handling any missing or invalid values.
- **Part B**: Create a new calculated column that extracts the hour from the timestamp column for hourly analysis.
- **Part C**: Build a dashboard with the following:
    - A **line chart** showing AQI trends for the top 3 cities during the selected hours of the day.
    - A **card** displaying the peak AQI for each city for the selected time range.
    - A **slicer** to filter data by hour or city.
    - A **table** showing hourly AQI data for the selected city.

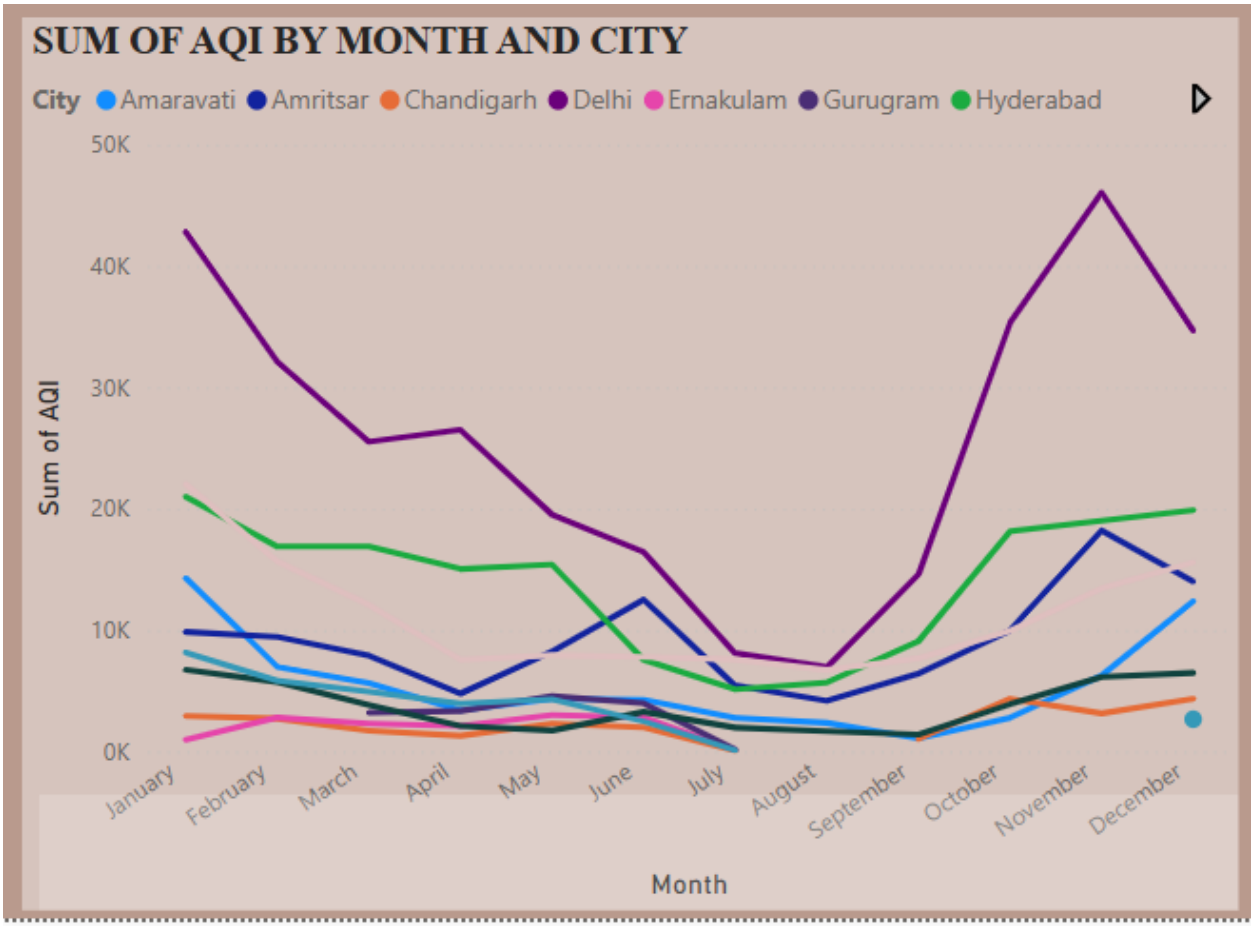
Points to cover:

- Data cleaning and handling hourly data.
- Creating calculated columns for time-based analysis.
- Dashboard creation with multiple components for hourly analysis.




AIR QUALITY BY CITY
309K
Sum of AQI
CITY
Amaravati
Ernakulam
Patna
Amritsar
Gurugram
Visakhapatnam
Chandigarh
Hyderabad
Delhi
Kolkata
SUM OF AQI BY MONTH AND CITY
City Delhi
50K
40K
30K
20K
10K
Sum of AQI
January
February
March
April
May
June
July
August
September
October
November
December
Month
SUM OF AQI BY CITY
City
Delhi
0K
50K
100K
150K
200K
250K
300K
350K
Sum of AQI


AIR QUALITY BY CITY
111K
Sum of AQI
CITY
Amaravati
Ernakulam
Patna
Amritsar
Gurugram
Visakhapatnam
Chandigarh
Hyderabad
Delhi
Kolkata
SUM OF AQI BY MONTH AND CITY
City Amritsar
20K
15K
10K
5K
Sum of AQI
January
February
March
April
May
June
July
August
September
October
November
December
Month
SUM OF AQI BY CITY
City
Amritsar
0K
20K
40K
60K
80K
100K
120K
Sum of AQI



This graph represents the **Sum of AQI (Air Quality Index) by Month and City** for different cities over a year. Here's a breakdown of what it shows:

Graph Interpretation:

1. **X-Axis (Month):** Displays months from January to December.
2. **Y-Axis (Sum of AQI):** Represents the total AQI values recorded for each city.
3. **Lines for Different Cities:** Each line represents a city's AQI trend over the months.
4. **Legend:** Cities such as Amaravati, Amritsar, Chandigarh, Delhi, Ernakulam, Gurugram, and Hyderabad are represented by different colors.

Key Observations:

- **Delhi (Purple Line) has the highest AQI** across the months, with a significant drop from January to July, followed by a sharp rise from August to December.
- **Gurugram (Green Line) follows a similar pattern** to Delhi, showing moderate AQI levels throughout the year with a peak towards the end.
- **Most other cities maintain relatively lower AQI levels**, fluctuating slightly across the months.

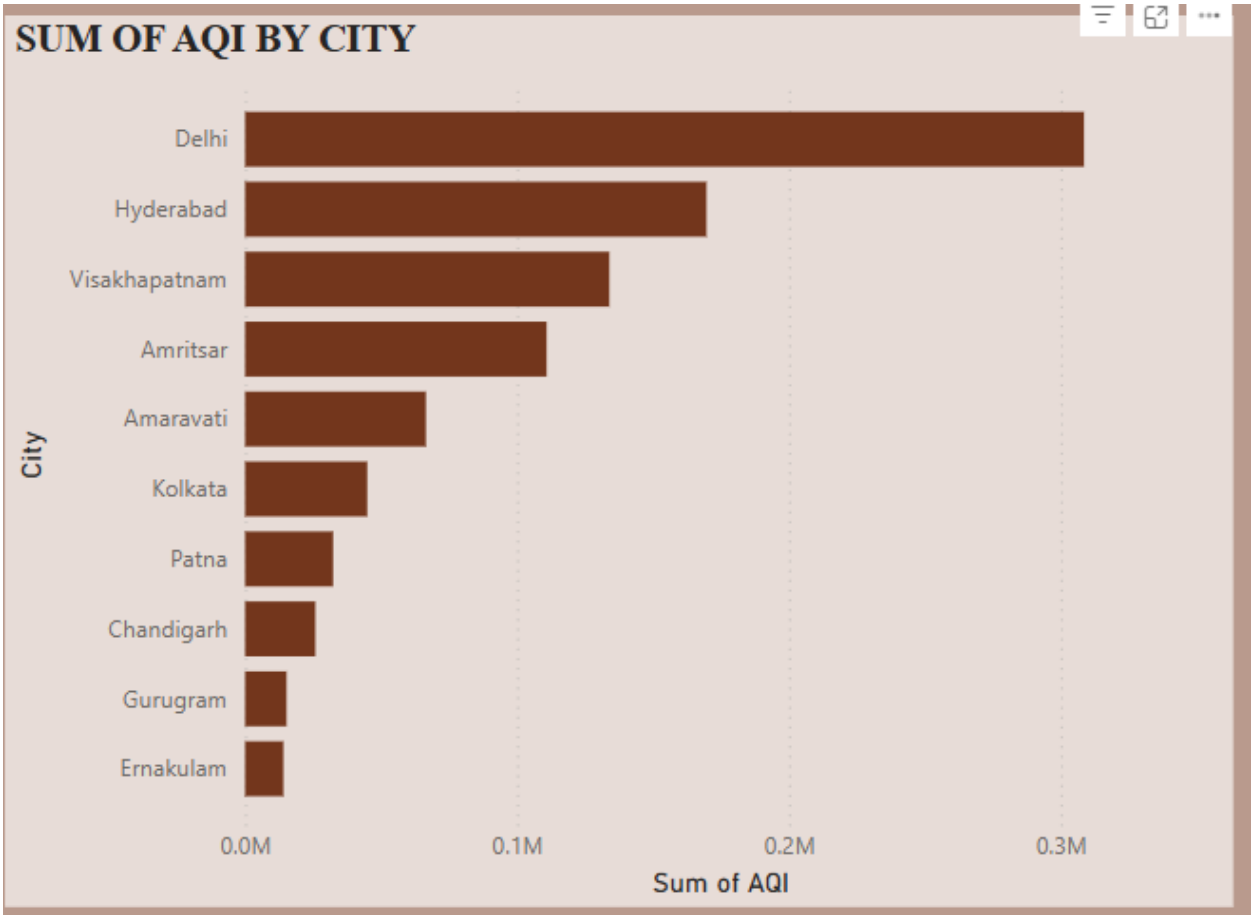
- **A noticeable peak in AQI occurs around October to December**, especially for Delhi and Gurugram, which aligns with seasonal pollution factors like winter smog, Diwali fireworks, and crop burning.
- **June, July, and August have the lowest AQI levels** for most cities, likely due to the monsoon season improving air quality.

Possible Causes of Trends:

- **Winter (October-December)** → Higher AQI due to air stagnation, pollution accumulation, and increased emissions.
- **Monsoon (June-August)** → Lower AQI as rain helps reduce airborne pollutants.
- **Summer (March-May)** → Moderate AQI as wind disperses pollutants but dust storms may contribute in some regions.

Conclusion:

This graph highlights how AQI fluctuates throughout the year for different cities, with Delhi and Gurugram showing extreme pollution levels, particularly towards year-end. It suggests the need for pollution control measures, especially in high-AQI months.



This bar chart represents the **Sum of AQI (Air Quality Index) by City**, summarizing the total AQI for each city over a given period.

Graph Interpretation:

1. **X-Axis (Sum of AQI):** Represents the cumulative AQI value for each city.
2. **Y-Axis (City):** Lists various cities ranked by their total AQI.
3. **Bars Represent AQI Levels:** Longer bars indicate higher total AQI values.

Key Observations:

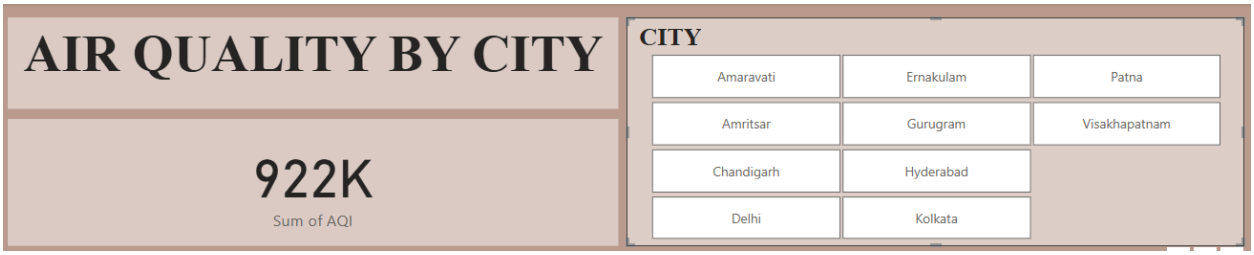
- **Delhi has the highest total AQI**, indicating it experiences the most severe air pollution among the cities listed.
- **Hyderabad and Visakhapatnam follow** with relatively high AQI, but significantly lower than Delhi.
- **Amritsar and Amaravati show moderate AQI levels**, with noticeable but smaller bars.
- **Cities like Kolkata, Patna, and Chandigarh have lower total AQI** but still show some pollution concerns.
- **Gurugram and Ernakulam have the lowest AQI values**, suggesting better air quality in comparison.

Possible Causes of AQI Variation:

- **Delhi's extreme pollution** could be due to industrial emissions, vehicular pollution, crop burning, and weather conditions trapping pollutants.
- **Hyderabad and Visakhapatnam's higher AQI** may be due to industrialization and vehicular pollution.
- **Cities with lower AQI (Gurugram, Ernakulam)** might have better environmental regulations, lesser industrial activity, or favorable weather conditions.

Conclusion:

This chart highlights that Delhi faces the most severe air pollution, while other cities show varying levels of air quality issues. It emphasizes the need for strict pollution control measures in highly polluted cities.



This dashboard panel provides a **summary of air quality (AQI) across different cities** in a simplified manner.

Components of the Dashboard:

1. **Title: "AIR QUALITY BY CITY"**
    - Indicates that the visualizations and metrics are focused on air quality data for various cities.
2. **Sum of AQI: "922K"**
    - This metric represents the total sum of AQI across all listed cities, meaning the combined air pollution levels from these locations.
3. **City List (Right Side Panel)**
    - Displays the names of cities being analyzed for AQI, including:
        - **Amaravati, Ernakulam, Patna, Amritsar, Gurugram, Visakhapatnam, Chandigarh, Hyderabad, Delhi, and Kolkata**.
    - Each city is presented in a structured box format, possibly as a filter or selection option for further analysis.

Key Takeaways:

- **The total AQI across all cities is 922,000**, which is a significant indicator of overall pollution.
- **Cities are listed in an organized manner**, likely allowing users to interact with the dashboard by selecting specific cities for deeper insights.
- This type of summary is useful in **quickly understanding the scale of air pollution** across multiple cities.

Conclusion:

This panel serves as a **high-level summary of air quality**, showing the cumulative AQI and listing the cities analyzed. It helps in quickly assessing air pollution trends before diving into detailed analysis.