

REPORT ON MINI PROJECT

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PROJECT NAME : Global Air Quality Messy Dataset 2023

PROJECT DOMAIN : ENVIRONMENTAL

SUBMISSION DATE : December 10,2025

MENTOR NAME : KUMURAN M

RAW DATASET LINK :

https://github.com/AkilaTharani-FNB07/Mini-Project-Excel-Power-BI/blob/main/global_air_quality_data_messy.csv

CLEANED DATASET LINK :

<https://github.com/AkilaTharani-FNB07/Mini-Project-Excel-Power-BI/blob/main/Global%20Air%20Quality%20Mini%20Project.xlsx>

GLOBAL AIR QUALITY ANALYSIS – PROJECT REPORT

1. Introduction

Air pollution has become one of the most serious global environmental issues. Countries across the world face increasing levels of PM2.5, PM10 and other harmful pollutants that directly affect human health and climate conditions.

This project focuses on analysing a Global Air Quality Dataset using Excel for cleaning and Power BI for visualization to understand pollution patterns, climate factors and regional variations.

2. Purpose of the Project

The main purpose of this project is to analyze global air quality patterns and create an interactive Power BI dashboard that helps users identify polluted regions, examine climatic impact, and explore trends across different countries and time periods.

3. Aim

To build a clean, interactive, and insightful air quality analysis dashboard that allows users to visually interpret environmental data and make data-driven decisions and to ensure data accuracy and create meaningful visual insights that help understand pollution levels across different countries and regions.

4. Objectives

To clean and prepare the raw air quality dataset.

To analyse global PM2.5, PM10, AQI, temperature, humidity and windspeed levels.

To build interactive visualizations and KPIs using Power BI.

To identify the most and least polluted countries and regions.

To study relationships between climate parameters and pollution indicators.

To generate insights using charts, maps, and filters.

5. Dataset Description

The dataset contains global air quality parameters:

PM2.5 , PM10, NO, SO2, CO, O3, Temperature, Humidity , Windspeed, Country & Date

The dataset was initially unclean and contained duplicated records, inconsistent date formats and missing values.

6. Problem Statement

The Global Air Quality dataset was messy and unstructured, making it difficult to analyze.

The challenge was to clean the data, remove inconsistencies, handle missing values, and convert it into a usable format for meaningful visual insights.

7. MISSION OF THE PROJECT

The mission of this project is to analyze and transform a messy global air quality dataset into meaningful insights, enabling better understanding of air pollution patterns across countries and cities, and supporting data-driven decisions for environmental awareness and policy making.

CLEANING STEPS USING DATASET IN EXCEL

Convert given dataset into table

By selecting the range **ctrl+a** and click insert tab - select Table option.

Raw dataset

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	City	Country	Date	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed			
2	Johannesburg	South Africa	04-10-2023	127.51	175.1		13.02	1.7	196.41	27.46	51.14	10.26			
3	Istanbul	Turkey	4/22/2023	93.84	34.19	79.49	44.54	5.18	183.62	10.58	30.48	14.45			
4	Berlin	Germany	10/27/2023	52.03	181.8	45.05	30.12	0.96	155.61	-4.09	96.9	2.49			
5	SYDNEY	Australia	06-10-2023	110.3		77.44	9.78	6.54	18.98	17.41	64.79	12.77			
6	Dubai	UAE	7/23/2023	120.24	48.98	98.82	6.27	6.98	133.94	13.11	31.61	5			
7	Johannesburg	South Africa	7/25/2023	119.39	148.61	38.32	21.48	1.79	96.78	-2.62	89.28	9.27			
8	Los Angeles	USA	4/24/2023			97.71	11.14	5.82	194.72	27.69	10.62	7.55			
9	Mumbai	India	02-12-2023	24.74	118.36	74.05	10.81	0.7	188.08	19.58	67.09	8.58			
10	Beijing	China	03-07-2023	100.19	10.16	74.82	39.88	6.81	176.9	32.85	17.65	9.53			
11	Johannesburg	South Africa	5/18/2023	80.94	13.09	63.86	15.58	4.52	168.04	39.59	86.25	16.46			
12	Los Angeles	USA	12/13/2023	67.85	108.38	67.98	32.69	5.95	170.87	16.12	40.58	18.13			
13	Johannesburg	South Africa	11/15/2023	99.36	154.53	82.78	49.93	0.49		39.61	40.87	12.49			
14	Paris	France	8/16/2023	19.06		46.89		1.92	129.03	23.41	93.31	17.85			
15	New York	USA	1/28/2023	37.32	137.91	70.67	1.04	2.87	54.77	31.16	75.64	1.24			
16	London	UK	3/23/2023	21.33	190.16	26.62	40.19	2.63	14.07	-8.78	44.95	2.39			
17	Seoul	South Korea	06-05-2023	79.71	195.27	91.26		1.24		-6.26	58	1.09			
18	Toronto	Canada	06-01-2023	111.9	117.86	60.31	10.03	2.13		35.09	16.04	19.73			
19	Beijing	China	04-03-2023	105.58	148.88	95.05	39.39	2.38	170.41	-5.82	29.38	13.34			
20	New York	USA	7/24/2023	10.67	80.75	48.55	22.89	5.49	165.33	17.85	44.37	4.8			
21	Tokyo	Japan	11/28/2023	127.93	83.61	61.25	33.36	6.32	24.78	-7.57	13.74	9.16			
22	London	UK	10/20/2023	130.94	119.31	18.4	18.21	5.94	164.46	31.36	62.94	10.5			
23	Mumbai	India	11/13/2023	50.27	114.71	60.56	21.8		58.38	37.23	32.97	6.56			
24	Dubai	UAE	11/19/2023	58.79	70.91	62.43	3.03	2.69	170.09	22.42	92.3	13.92			
25	Mexico City	Mexico	9/25/2023	61.98	57.84	56.01		4.83	23.04	23.47	97.29	5.97			
26	Madrid	Spain	04-01-2023	6.29	167.41	71.93	17.52	3.31	153.19	22.29	37.78	8.72			
27	London	UK	9/17/2023	142.00	175.05	44.44	20.50	2.00	160.00	0.47	66.37	1.21			

After inserting table

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	City1	City	Country	Date	Date2	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed
2	Johannesburg	Johannesburg	South Africa	04-10-2023	04-10-2023	127.51	175.1			13.02	1.7	196.41	27.46	51.14
3	Istanbul	Istanbul	Turkey	4-22-2023	22-04-2023	93.84	34.19	79.49	44.54	5.18	183.62	10.58	30.48	14.45
4	Berlin	Berlin	Germany	10-27-2023	27-10-2023	52.03	181.8	45.05	30.12	0.96	155.61	-4.09	96.9	2.49
5	SYDNEY	Sydney	Australia	06-10-2023	06-10-2023	110.3		77.44	9.78	6.54	18.98	17.41	64.79	12.77
6	Dubai	Dubai	United Arab Emirate	7-23-2023	23-07-2023	120.24	48.98	98.82	6.27	6.98	133.94	13.11	31.61	5
7	Johannesburg	Johannesburg	South Africa	7-25-2023	25-07-2023	119.39	148.61	38.32	21.48	1.79	96.78	-2.62	89.28	9.27
8	Los Angeles	Los Angeles	United States Of Am	4-24-2023	24-04-2023			97.71	11.14	5.82	194.72	27.69	10.62	7.55
9	Mumbai	Mumbai	India	02-12-2023	02-12-2023	24.74	118.36	74.05	10.81	0.7	188.08	19.58	67.09	8.58
10	Beijing	Beijing	China	03-07-2023	03-07-2023	100.19	10.16	74.82	39.88	6.81	176.9	32.85	17.65	9.53
11	Johannesburg	Johannesburg	South Africa	5-18-2023	18-05-2023	80.94	13.09	63.86	15.58	4.52	168.04	39.59	86.25	16.46
12	Los Angeles	Los Angeles	United States Of Am	12-13-2023	13-12-2023	67.85	108.38	67.98	32.69	5.95	170.87	16.12	40.58	18.13
13	Johannesburg	Johannesburg	South Africa	11-15-2023	15-11-2023	99.36	154.53	82.78	49.93	0.49		39.61	40.87	12.49
14	Paris	Paris	France	8-16-2023	16-08-2023	19.06		46.89		1.92	129.03	23.41	93.31	17.85
15	New York	New York	United States Of Am	1-28-2023	28-01-2023	37.32	137.91	70.67	1.04	2.87	54.77	31.16	75.64	1.24
16	London	London	United Kingdom	3-23-2023	23-03-2023	21.33	190.16	26.62	40.19	2.63	14.07	-8.78	44.95	2.39
17	Seoul	Seoul	South Korea	06-05-2023	06-05-2023	79.71	195.27	91.26		1.24		-6.26	58	1.09
18	Toronto	Toronto	Canada	06-01-2023	06-01-2023	111.9	117.86	60.31	10.03	2.13		35.09	16.04	19.73
19	Beijing	Beijing	China	04-03-2023	04-03-2023	105.58	148.88	95.05	39.39	2.38	170.41	-5.82	29.38	13.34
20	New York	New York	United States Of Am	7-24-2023	24-07-2023	10.67	80.75	48.55	22.89	5.49	165.33	17.85	44.37	4.8
21	Tokyo	Tokyo	Japan	11-28-2023	28-11-2023	127.93	83.61	61.25	33.36	6.32	24.78	-7.57	13.74	9.16
22	London	London	United Kingdom	10-20-2023	20-10-2023	130.94	119.31	18.4	18.21	5.94	164.46	31.36	62.94	10.5
23	Mumbai	Mumbai	India	11-13-2023	13-11-2023	50.27	114.71	60.56	21.8		58.38	37.23	32.97	6.56
24	Dubai	Dubai	United Arab Emirate	11-19-2023	19-11-2023	58.79	70.91	62.43	3.03	2.69	170.09	22.42	92.3	13.92
25	Mexico City	Mexico City	Mexico	9-25-2023	25-09-2023	61.98	57.84	56.01		4.83	23.04	23.47	97.29	5.97
26	Madrid	Madrid	Spain	04-01-2023	04-01-2023	6.29	167.41	71.93	17.52	3.31	153.19	22.29	37.78	8.72

Removed Duplicates

In Data tab, Clicked Removed duplicates by selecting Country and date column ,24332 duplicate removed ,6119 unique values found.

The screenshot shows a Microsoft Excel spreadsheet with the following data and message:

	F	G	H	I	J	K	L	M
	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed	Date2
75.1	13.02	1.7	196.41	27.46	51.14	10.26	45203	
34.19	79.49	44.54	5.18	183.62	10.58	30.48	14.45	45038
181.8	45.05	30.12	0.96	155.61	-4.09	96.9	2.49	45226
	77.44	9.78	6.54	18.98	17.41	64.79	12.77	45205
48.98	98.82	6.27	6.98	133.94	13.11	31.61	5	45130
10.21	60.00	31.10	1.70	22.70	0.00	22.00	0.07	45132
soft Excel								
24332 duplicate values found and removed; 6119 unique values remain. Note that counts may include empty cells, spaces, etc.								
<input type="button" value="OK"/>								

The data table contains 10 columns: NO2, SO2, CO, O3, Temperature, Humidity, Wind Speed, Date2, and an empty column at the end. The rows show various environmental measurements and dates. A message at the bottom indicates 24332 duplicates were removed, leaving 6119 unique values. An 'OK' button is present at the bottom of the message area.

Standardized Country Column

Standardized Country column by clicking Find and select option- Replace in Home tab , UAE,USA and UK Replaced into full form.

Original Column

Country
South Africa
Turkey
Germany
Australia
UAE
South Africa
USA
India
China
South Africa
USA
South Africa
France
USA
UK
South Korea
Canada
China
USA
Japan
UK
India
UAE
Mexico
Spain

Standardized Column

Country
South Africa
Turkey
Germany
Australia
United Arab Emirates
South Africa
United States Of America
India
China
South Africa
United States Of America
South Africa
France
United States Of America
United Kingdom
South Korea
Canada
China
United States Of America
Japan
United Kingdom
India
United Arab Emirates
Mexico
Spain
United Kingdom

Standardized City Column

There are many inconsistent values with full capital words and misspellings. So added new column and used Proper Function which Capitalizes each word.

Original Column

A
City1
Johannesburg
Istanbul
Berlin
SYDNEY
Dubai
Johannesburg
Los Angeles
Mumbai
Beijing
Johannesburg
Los Angeles
Johannesburg
Paris
New York
London
Seoul
Toronto
Beijing
New York
Tokyo
london
Mumbai
Dubai
Mexico City
Madrid
London

Standardized Column

B
City
Johannesburg
Istanbul
Berlin
Sydney
Dubai
Johannesburg
Los Angeles
Mumbai
Beijing
Johannesburg
Los Angeles
Johannesburg
Paris
New York
London
Seoul
Toronto
Beijing
New York
Tokyo
London
Mumbai
Dubai
Mexico City
Madrid
London
Mexico City

Formula Used - =PROPER(A2)

The screenshot shows the Excel formula bar at the top with the formula `=PROPER(A2)`. Below the formula bar is a table with two columns: "City" and "Country". The table contains the following data:

City	Country
Johannesburg	South Africa
Istanbul	Turkey
Berlin	Germany
Sydney	Australia
Dubai	United Arab Emirates
Johannesburg	South Africa
Los Angeles	United States
Mumbai	India
Beijing	China
Johannesburg	South Africa

Inconsistent Date Column

Mixed up with both / and - format , so i replaced / into - using Replace option in Excel, then used a formula and converted into date format as “dd-mm-yyyy” in custom option (Numbers)

Formula Used -

```
=IF(ISNUMBER(D3),D3,IFERROR(DATE(RIGHT(D3,4),LEFT(D3,FIND("-",D3)-1),MID(D3,FINDD("-",D3)+1,FIND("-",D3,4)-FIND("-",D3)-1)),D3))
```

Original Column

D
Date1
04-10-2023
4-22-2023
10-27-2023
06-10-2023
7-23-2023
7-25-2023
4-24-2023
02-12-2023
03-07-2023
5-18-2023
12-13-2023
11-15-2023
8-16-2023
1-28-2023
3-23-2023
06-05-2023
06-01-2023
04-03-2023
7-24-2023
11-28-2023
10-20-2023
11-13-2023
11-19-2023

Standardized Column

E
Date2
04-10-2023
22-04-2023
27-10-2023
06-10-2023
23-07-2023
25-07-2023
24-04-2023
02-12-2023
03-07-2023
18-05-2023
13-12-2023
15-11-2023
16-08-2023
28-01-2023
23-03-2023
06-05-2023
06-01-2023
04-03-2023
24-07-2023
28-11-2023
20-10-2023
13-11-2023
19-11-2023
25-09-2023
04-01-2023

Filled blanks and missing values using power query in excel

Selecting the column and groupby-Count rows , Replacing with most occurring value

Changed decimal to whole number (PM2.5,PM10,NO2,SO2,CO,O3) in power Query

Before filling missing values/ null

	PM2.5	PM10	NO2	SO2	CO	O3
1	128	175	null	13	2	196
2	94	34	79	45	5	184
3	52	182	45	30	1	156
4	110	null	77	10	7	19
5	120	49	99	6	7	134
6	119	149	38	21	2	97
7	null	null	98	11	6	195
8	25	118	74	11	1	188
9	100	10	75	40	7	177
10	81	13	64	16	5	168
11	68	108	68	33	6	171
12	99	155	83	50	0	null
13	19	null	47	null	2	129
14	37	138	71	1	3	55
15	21	190	27	40	3	14
16	80	195	91	null	1	null
17	112	118	60	10	2	null
18	106	149	95	39	2	170
19	11	81	49	23	5	165
20	128	84	61	33	6	25
21	131	119	18	18	6	164
22	50	115	61	22	null	58
23	59	71	62	3	3	170
24	62	58	56	null	5	23
25	6	167	72	18	3	153
26	143	176	44	21	4	160
27	81	124	10	48	9	23

After filling missing values using groupby,countrows,replaced with most occurring value

Queries [1] X ✓ fx

Table1

	PM2.5	PM10	NO2	SO2	CO	O3	Temperatur
1	128	175	30	13	2	196	
2	94	34	79	45	5	184	
3	52	182	45	30	1	156	
4	110	82	77	10	7	19	
5	120	49	99	6	7	134	
6	119	149	38	21	2	97	
7	15	82	98	11	6	195	
8	25	118	74	11	1	188	
9	100	10	75	40	7	177	
10	81	13	64	16	5	168	
11	68	108	68	33	6	171	
12	99	155	83	50	0	157	
13	19	82	47	5	2	129	
14	37	138	71	1	3	55	
15	21	190	27	40	3	14	
16	80	195	91	5	1	157	
17	112	118	60	10	2	157	
18	106	149	95	39	2	170	
19	11	81	49	23	5	165	
20	128	84	61	33	6	25	
21	131	119	18	18	6	164	
22	50	115	61	22	6	58	
23	59	71	62	3	3	170	
24	62	58	56	5	5	23	
25	6	167	72	18	3	153	
26	143	176	44	21	4	160	
27	81	124	10	48	9	23	
28							

Query Settings X

PROPERTIES

Name: Table1

All Properties

APPLIED STEPS

- Source
- Changed Type
- Replaced 15-PM2.5
- Replaced 82-PM10
- Replaced 30-NO2
- Replaced 5-SO2
- Replaced 6-CO
- Replaced 157-03
- Changed Type1

PM2.5 (Groupby)

	1	2	3	PM2.5	Count
1				null	338
2				15	55

PM10 (Groupby)

	1	2	3	PM10	Count
1				null	312
2				82	48

NO2 (Groupby)

	1	2	3	NO2	Count
1				null	332
2				30	88

SO2 (Groupby)

	1	2	3	Count
			null	313
	1	2	5	150

CO (Groupby)

	1	2	3	Count
			6	623
	1	2	null	297

O3 (Groupby)

	123 03	Count
1	null	313
2	157	45
3	155	45

After cleaning the dataset , Pasted the cleaned dataset in new Sheet using Xlookup formula

A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	City	Country	Date2	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed	Temperature Category	Region
2	Johannesburg	South Africa	04-10-2023	128	175	30	13	2	196	27	51	10	High	Africa
3	Istanbul	Turkey	22-04-2023	94	34	79	45	5	184	11	30	14	Low	Europe
4	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Low	Europe
5	Sydney	Australia	06-10-2023	110	82	77	10	7	19	17	65	13	Moderate	Oceania
6	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Low	Asia
7	Johannesburg	South Africa	04-10-2023	128	175	30	13	2	196	27	51	10	High	Africa
8	Los Angeles	United States Of America	24-04-2023	15	82	98	11	6	195	28	11	8	High	America
9	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Moderate	Asia
10	Beijing	China	03-07-2023	100	10	75	40	7	177	33	18	10	High	Asia
11	Johannesburg	South Africa	04-10-2023	128	175	30	13	2	196	27	51	10	High	Africa
12	Los Angeles	United States Of America	24-04-2023	15	82	98	11	6	195	28	11	8	High	America
13	Johannesburg	South Africa	04-10-2023	128	175	30	13	2	196	27	51	10	High	Africa
14	Paris	France	16-08-2023	19	82	47	5	2	129	23	93	18	Moderate	Europe
15	New York	United States Of America	28-01-2023	37	138	71	1	3	55	31	76	1	High	America
16	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Low	Europe
17	Seoul	South Korea	06-05-2023	80	195	91	5	1	157	-6	58	1	Low	Asia
18	Toronto	Canada	06-01-2023	112	118	60	10	2	157	35	16	20	High	America
19	Beijing	China	03-07-2023	100	10	75	40	7	177	33	18	10	High	Asia
20	New York	United States Of America	28-01-2023	37	138	71	1	3	55	31	76	1	High	America
21	Tokyo	Japan	28-11-2023	128	84	61	33	6	25	-8	14	9	Low	Asia
22	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Low	Europe
23	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Moderate	Asia
24	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Low	Asia
25	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	Moderate	America

< > Global Air Quality Table1 Cleaned Asia Europe Africa America Oceania + :

Created Temperature Category column using IF Function

Formula Used - =IF(J2<=15,"Low",IF(J2<=25,"Moderate","High"))

N	Temperature Category
	High
	Low
	Low
	Moderate
	Low
	High
	High
	Moderate
	High
	High
	High
	High
	Moderate
	High
	Low
	Low
	High
	High
	Low
	Low
	Moderate
	Low
	Moderate
	Moderate
	Low
	Moderate
	Low
	Low

Created Region Column based on the Country

Formula Used - =IFS(OR(B2="India",B2="Thailand",B2="United Arab Emirates",B2="Japan",B2="South Korea",B2="China"),"Asia", OR(B2="Russia",B2="Germany",B2="France",B2="Spain",B2="Turkey",B2="United Kingdom"),"Europe",OR(B2="United States Of America",B2="Canada",B2="Mexico",B2="Brazil"),"America", OR(B2="Egypt",B2="South Africa"),"Africa", B2="Australia","Oceania",TRUE,"Others")

Region
Africa
Europe
Europe
Oceania
Asia
Africa
America
Asia
Asia
Africa
America
Africa
Europe
America
Europe
Asia
America
Asia
America
Asia
Europe
Asia
Asia
America
Europe
Europe
America

Created Some tables for use in Power BI ,since we need atleast 3 tables for modelling, to calculate column,measure and table

Asia ,Europe,America, Europe ,Oceania and Africa by filtered and pasted as new tables

Asia

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	City	Country	Date	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed	Region	Temperature Category	
2	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low	
3	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Asia	Moderate	
4	Beijing	China	03-07-2023	100	10	75	40	7	177	33	18	10	Asia	High	
5	Seoul	South Korea	06-05-2023	80	195	91	5	1	157	-6	58	1	Asia	Low	
5	Beijing	China	03-07-2023	100	10	75	40	7	177	33	18	10	Asia	High	
7	Tokyo	Japan	28-11-2023	128	84	61	33	6	25	-8	14	9	Asia	Low	
3	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Asia	Moderate	
9	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low	
0	Seoul	South Korea	27-11-2023	74	150	42	12	1	140	4	80	6	Asia	Low	
1	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low	
2	Bangkok	Thailand	04-09-2023	107	73	77	3	5	98	10	61	5	Asia	Low	
3	Seoul	South Korea	27-11-2023	74	150	42	12	1	140	4	80	6	Asia	Low	
4	Seoul	South Korea	27-11-2023	74	150	42	12	1	140	4	80	6	Asia	Low	
5	Bangkok	Thailand	04-09-2023	107	73	77	3	5	98	10	61	5	Asia	Low	
6	Seoul	South Korea	27-11-2023	74	150	42	12	1	140	4	80	6	Asia	Low	
7	Tokyo	Japan	28-11-2023	128	84	61	33	6	25	-8	14	9	Asia	Low	
8	Bangkok	Thailand	04-09-2023	107	73	77	3	5	98	10	61	5	Asia	Low	
9	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Asia	Moderate	
0	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low	
1	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Asia	Moderate	
2	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low	
3	Tokyo	Japan	28-11-2023	128	84	61	33	6	25	-8	14	9	Asia	Low	
4	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Asia	Moderate	
5	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low	
6	Seoul	South Korea	27-11-2023	74	150	42	12	1	140	4	80	6	Asia	Low	

< > Global Air Quality Table1 Cleaned Global Air Quality Asia Europe Africa America Oceania + : < >

Europe

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	City	Country	Date	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed	Region	Temperature Category
2	Istanbul	Turkey	22-04-2023	94	34	79	45	5	184	11	30	14	Europe	Low
3	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
4	Paris	France	16-08-2023	19	82	47	5	2	129	23	93	18	Europe	Moderate
5	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Europe	Low
6	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Europe	Low
7	Madrid	Spain	04-01-2023	6	167	72	18	3	153	22	38	9	Europe	Moderate
8	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Europe	Low
9	Madrid	Spain	04-01-2023	6	167	72	18	3	153	22	38	9	Europe	Moderate
10	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Europe	Low
11	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
12	Moscow	Russia	11-08-2023	50	164	15	11	7	120	1	90	7	Europe	Low
13	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
14	Moscow	Russia	11-08-2023	50	164	15	11	7	120	1	90	7	Europe	Low
15	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
16	Madrid	Spain	04-01-2023	6	167	72	18	3	153	22	38	9	Europe	Moderate
17	Paris	France	16-08-2023	19	82	47	5	2	129	23	93	18	Europe	Moderate
18	Istanbul	Turkey	22-04-2023	94	34	79	45	5	184	11	30	14	Europe	Low
19	Istanbul	Turkey	22-04-2023	94	34	79	45	5	184	11	30	14	Europe	Low
20	Berlin	Germany	19-02-2023	135	124	74	16	7	103	23	75	3	Europe	Moderate
21	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Europe	Low
22	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
23	Paris	France	16-08-2023	19	82	47	5	2	129	23	93	18	Europe	Moderate
24	Paris	France	16-08-2023	19	82	47	5	2	129	23	93	18	Europe	Moderate
25	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
26	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low

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Global Air Quality

Table1

Cleaned Global Air Quality

Asia

Europe

Africa

America

Oceania

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Africa

America

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	City	Country	Date	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed	Region	Temperature Category
2	Los Angeles	United States	24-04-2023	15	82	98	11	6	195	28	11	8	America	High
3	Los Angeles	United States	24-04-2023	15	82	98	11	6	195	28	11	8	America	High
4	New York	United States	28-01-2023	37	138	71	1	3	55	31	76	1	America	High
5	Toronto	Canada	06-01-2023	112	118	60	10	2	157	35	16	20	America	High
6	New York	United States	28-01-2023	37	138	71	1	3	55	31	76	1	America	High
7	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
8	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
9	New York	United States	03-11-2023	71	152	60	38	9	95	34	43	14	America	High
10	New York	United States	28-01-2023	37	138	71	1	3	55	31	76	1	America	High
11	Rio De Janeiro	Brazil	18-01-2023	136	179	30	3	8	120	32	97	18	America	High
12	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
13	Rio De Janeiro	Brazil	18-01-2023	136	179	30	3	8	120	32	97	18	America	High
14	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
15	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
16	Toronto	Canada	06-01-2023	112	118	60	10	2	157	35	16	20	America	High
17	Los Angeles	United States	24-04-2023	15	82	98	11	6	195	28	11	8	America	High
18	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
19	Rio De Janeiro	Brazil	18-01-2023	136	179	30	3	8	120	32	97	18	America	High
20	Toronto	Canada	06-01-2023	112	118	60	10	2	157	35	16	20	America	High
21	New York	United States	03-11-2023	71	152	60	38	9	95	34	43	14	America	High
22	Rio De Janeiro	Brazil	18-01-2023	136	179	30	3	8	120	32	97	18	America	High
23	Rio De Janeiro	Brazil	18-01-2023	136	179	30	3	8	120	32	97	18	America	High
24	Toronto	Canada	06-01-2023	112	118	60	10	2	157	35	16	20	America	High
25	New York	United States	28-01-2023	37	138	71	1	3	55	31	76	1	America	High
26	Montreal	Canada	17-05-2023	10	20	20	2	1	70	9	45	10	America	Low



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Global Air Quality

Table1

Cleaned Global Air Quality

Asia

Europe

Africa

America

Oceania



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Oceania

CLEANED DATASET (GLOBAL AIR QUALITY 2023)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	City	Country	Date	PM2.5	PM10	NO2	SO2	CO	O3	Temperature	Humidity	Wind Speed	Region	Temperature Category
2	Johannesburg	South Africa	04-10-2023	128	175	30	13	2	196	27	51	10	Africa	High
3	Istanbul	Turkey	22-04-2023	94	34	79	45	5	184	11	30	14	Europe	Low
4	Berlin	Germany	27-10-2023	52	182	45	30	1	156	-4	97	2	Europe	Low
5	Sydney	Australia	06-10-2023	110	82	77	10	7	19	17	65	13	Oceania	Moderate
6	Dubai	United Arab Emirates	23-07-2023	120	49	99	6	7	134	13	32	5	Asia	Low
7	Johannesburg	South Africa	25-07-2023	119	149	38	21	2	97	-3	89	9	Africa	High
8	Los Angeles	United States Of America	24-04-2023	15	82	98	11	6	195	28	11	8	America	High
9	Mumbai	India	02-12-2023	25	118	74	11	1	188	20	67	9	Asia	Moderate
10	Beijing	China	03-07-2023	100	10	75	40	7	177	33	18	10	Asia	High
11	Johannesburg	South Africa	18-05-2023	81	13	64	16	5	168	40	86	16	Africa	High
12	Los Angeles	United States Of America	13-12-2023	68	108	68	33	6	171	16	41	18	America	High
13	Johannesburg	South Africa	15-11-2023	99	155	83	50	0	157	40	41	12	Africa	High
14	Paris	France	16-08-2023	19	82	47	5	2	129	23	93	18	Europe	Moderate
15	New York	United States Of America	28-01-2023	37	138	71	1	3	55	31	76	1	America	High
16	London	United Kingdom	23-03-2023	21	190	27	40	3	14	-9	45	2	Europe	Low
17	Seoul	South Korea	06-05-2023	80	195	91	5	1	157	-6	58	1	Asia	Low
18	Toronto	Canada	06-01-2023	112	118	60	10	2	157	35	16	20	America	High
19	Beijing	China	04-03-2023	106	149	95	39	2	170	-6	29	13	Asia	High
20	New York	United States Of America	24-07-2023	11	81	49	23	5	165	18	44	5	America	High
21	Tokyo	Japan	28-11-2023	128	84	61	33	6	25	-8	14	9	Asia	Low
22	London	United Kingdom	20-10-2023	131	119	18	18	6	164	31	63	10	Europe	Low
23	Mumbai	India	13-11-2023	50	115	61	22	6	58	37	33	7	Asia	Moderate
24	Dubai	United Arab Emirates	19-11-2023	59	71	62	3	3	170	22	92	14	Asia	Low
25	Mexico City	Mexico	25-09-2023	62	58	56	5	5	23	23	97	6	America	Moderate
26	Madrid	Spain	01-01-2023	6	107	70	10	0	150	20	20	8	Europe	Moderate

VISUALIZATION USING POWER BI

MEASURES

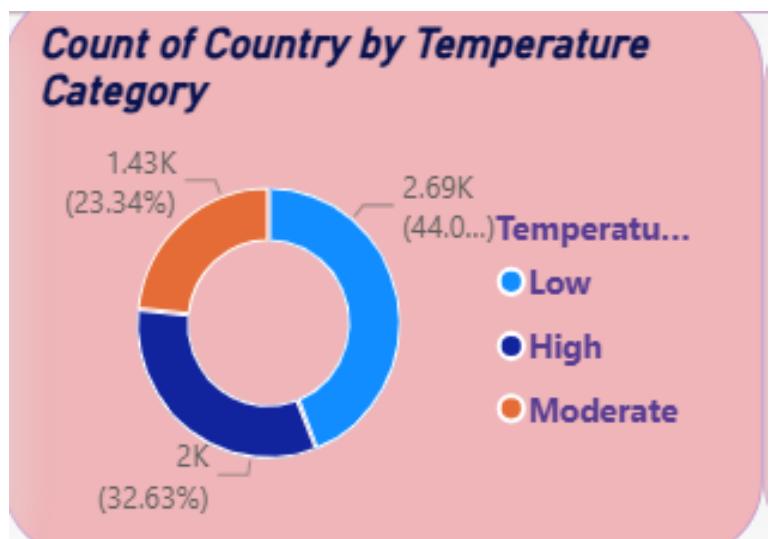
Calculated measure by clicking new measure in the home tab and Calculated each measure and named it . Selected the card visual and dragged the measure in the field and done for each and every card as it is .



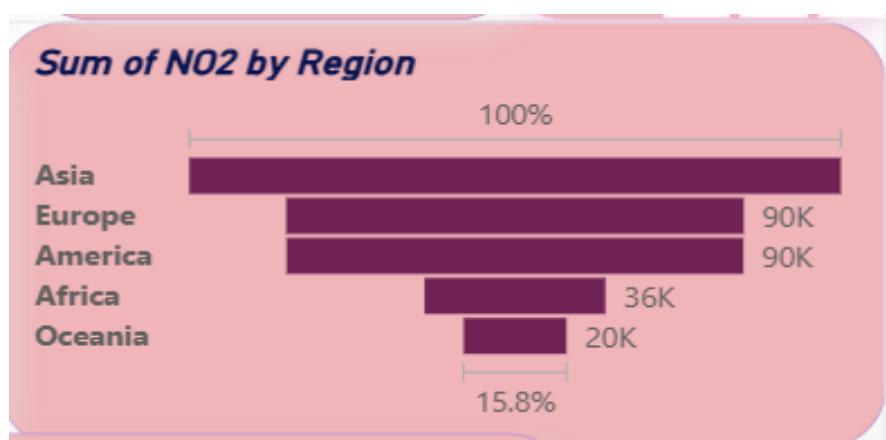
DATA VISUALIZATION

CHARTS USED

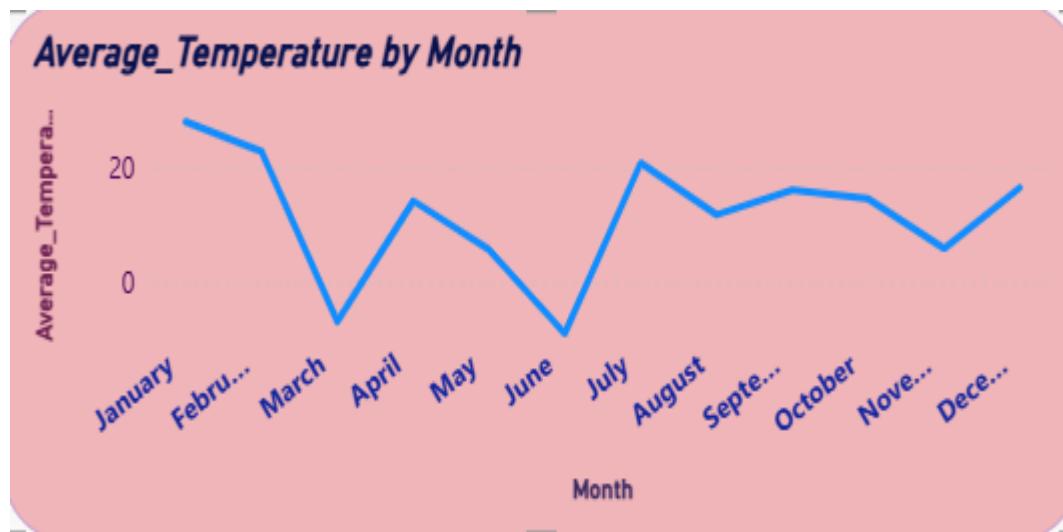
DONUT CHART



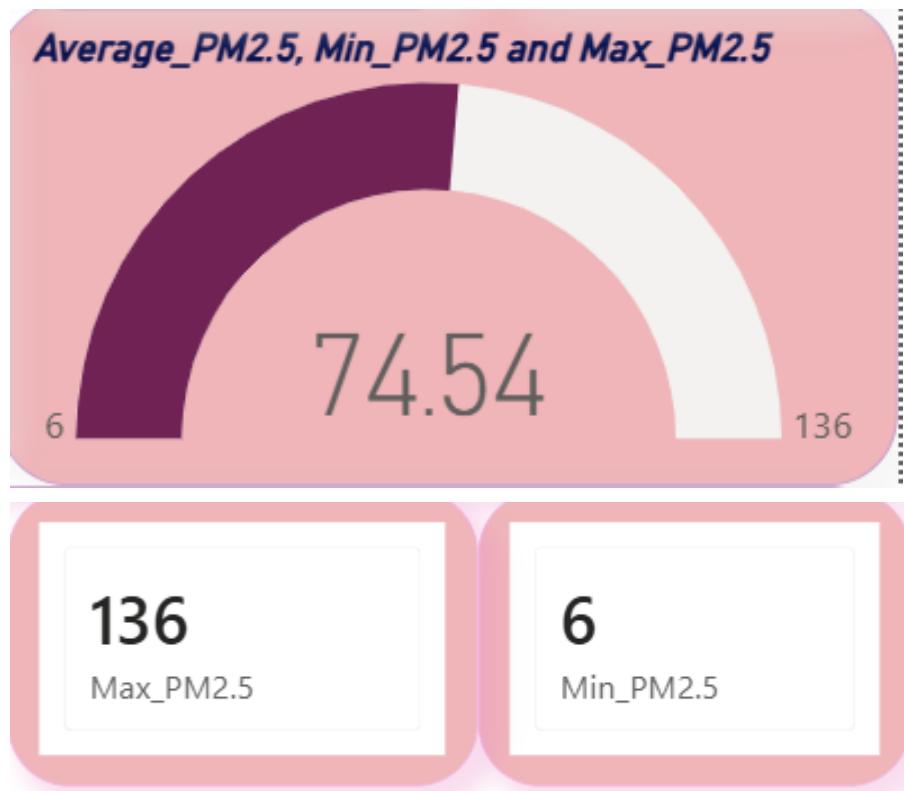
FUNNEL CHART



LINE CHART



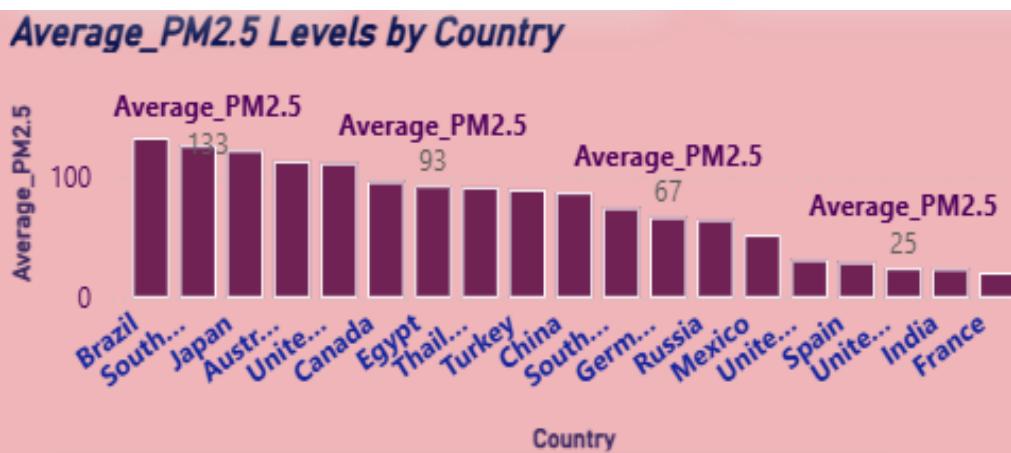
GAUGE VISUAL



MATRIX VISUAL

Month	Africa	America	Asia	Europe	Oceania	Total
January		3633	840	6721	441	11635
February				912		912
March			2256	10040		12296
April	4064	2761		11430		18255
May		1509	2327			3836
June	1749					1749
July	348		11942	513		12803
August				4146		4146
September		1205	783			1988
October	3419	2304		7590	2440	15753
November		2434	11205	1664		15303
December			5132	2301		7433
Total	9580	13846	34485	45317	2881	106109

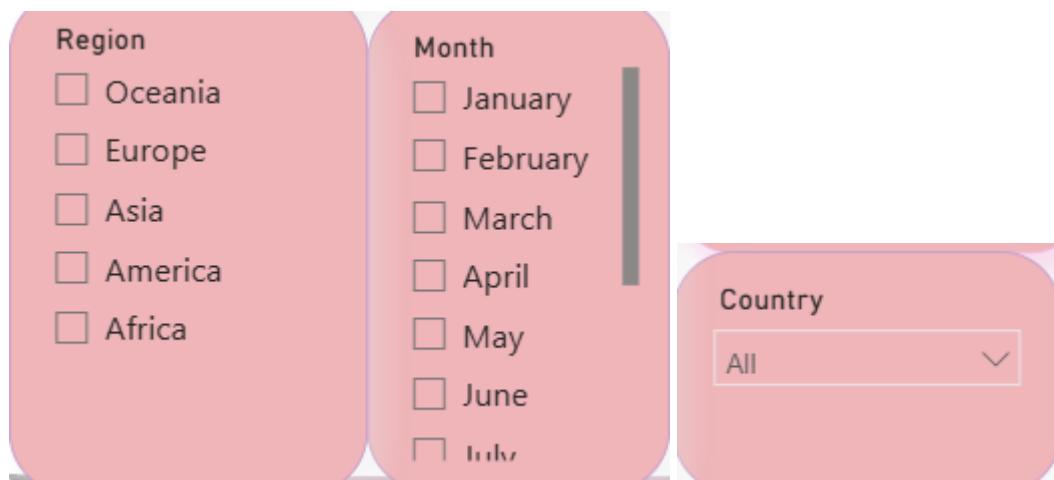
STACKED COLUMN CHART



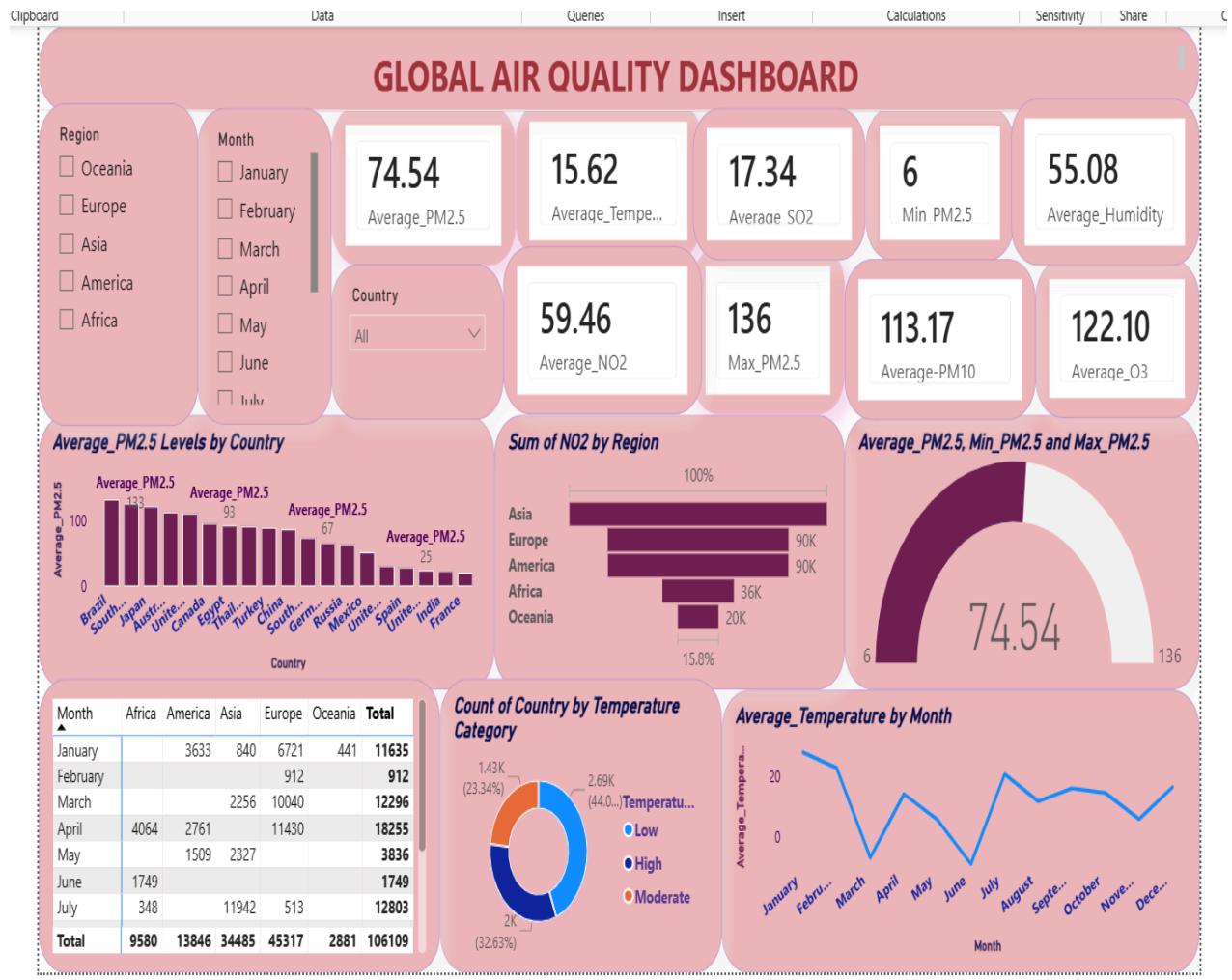
SLICERS USED IN DASHBOARD

Region,Country and Month

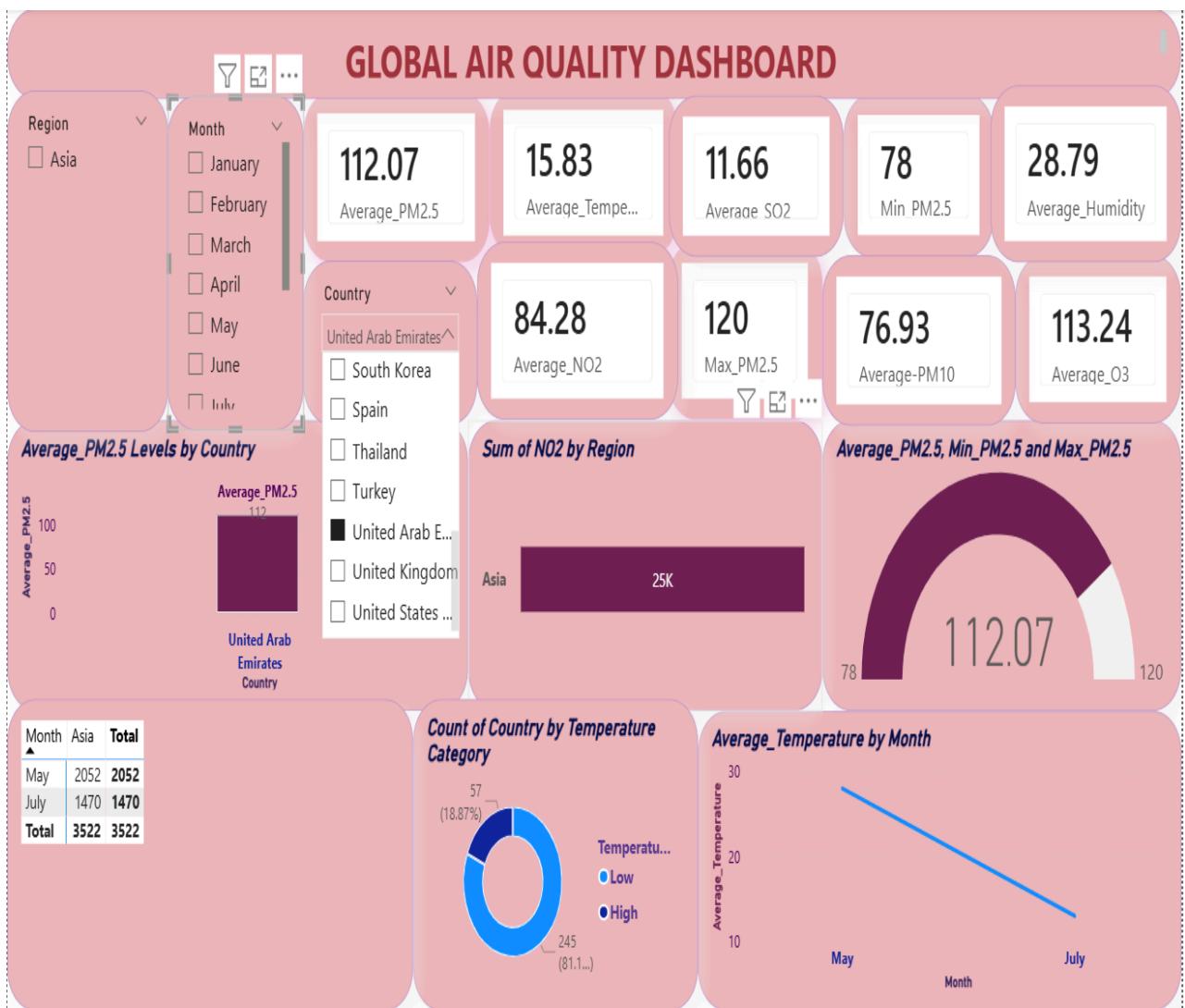
Used vertical list in Region and Month slicer ,
Dropdown for Country in the dashboard



DASHBOARD



After Using Slicer in the Dashboard



INSIGHTS FROM THE GLOBAL AIR QUALITY DASHBOARD

1. Overall Air Quality Levels (KPIs)

PM2.5 average = 74.54 $\mu\text{g}/\text{m}^3$ → This is above WHO safe limit (25) → indicates poor air quality.

PM10 average = 113.17 $\mu\text{g}/\text{m}^3$ → Also indicates dust-heavy and polluted environments.

NO2 (59.46) and SO2 (17.34) show high vehicular & industrial emissions.

CO (4.50) and Ozone (122.10) also reflect mixed pollution sources (traffic + heat + chemical reactions).

Overall, your dataset clearly represents moderate to severe pollution levels across many locations.

2. Temperature & Weather Influence

Average temperature = 15.62°C, with maximum shown as 136 in the gauge (This is likely AQI max PM2.5, not temperature).

Temperature trending chart shows higher months (like May–July) having slightly higher pollution → heat can worsen O₃ & PM levels.

3. Region-wise Insights (Pie & Bar Charts)

- Wind Speed Distribution (Pie Chart)

Most countries fall in wind speed 5–8 range, indicating moderate air movement.

Low wind speed areas (0–3) typically show higher pollutant accumulation.

- Region by NO₂ (Bar Chart)

Asia has the highest NO₂ levels (129K) → Highest industrial + vehicle density.

Europe and America follow next.

Africa and Oceania have the least → Indicating better air quality comparatively.

4. Country-Level Insights (Bar Chart)

Some countries show very high PM2.5 averages (left side of the bar chart).

Others maintain lower pollution levels, showing strong variation across countries.

This helps identify high-risk vs low-risk locations globally.

5. Temperature Category Distribution (Donut Chart)

Most countries fall into Moderate temperature category.

High temperature countries may correlate with higher ozone formation, which matches the high O₃ KPI value.

6. Monthly Trends (Line Chart)

Pollution levels fluctuate month-to-month.

Some months show spikes, likely due to seasonal effects like:

- winter inversion
- summer heat & dust
- industrial cycles

SUMMARY OF INSIGHTS

- Pollution is significantly high in many regions

Especially Asia, with the highest concentration of NO₂ and PM_{2.5}.

- Weather factors (temp, wind speed) affect pollution

Moderate wind speeds & seasonal changes influence pollutant dispersion.

- Different countries show huge variation

Some countries are extremely polluted, while others maintain acceptable levels.

- Strong contribution from traffic & industries

High NO₂ + PM values indicate motor vehicles + factories.

CONCLUSION

The Global Air Quality Dashboard successfully provides a comprehensive understanding of worldwide pollution patterns. The analysis shows

that particulate matter (PM_{2.5} & PM₁₀) and gaseous pollutants (NO₂, SO₂, CO, O₃) remain significantly above recommended limits in several regions, especially Asia.

Weather variables such as temperature and wind speed also play a major role in pollutant accumulation. These findings highlight the urgent need for stricter emission control, urban planning improvements, and continuous monitoring to protect public health.

