

Air quality analysis and prediction in Tamilnadu

Phase 3 Project

This is the csv file given in the dataset in which we can find AQI for the desired area:

	A	B	C	D	E	F	G	H	I	J	K	
1	Stn Code	Sampling Dat	State	City/Town/Vi	Location of M	Agency	Type of Locat	SO2	NO2	RSPM/PM10	PM 2.5	
2	38	1/2/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	11	17	55	NA	
3	38	1/7/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	13	17	45	NA	
4	38	1/14/2021	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	12	18	50	NA	
5	38	1/14/2023	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	15	16	46	NA	
6	38	1/14/2028	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	13	14	42	NA	
7	38	1/14/1930	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	14	18	43	NA	
8	38	2/4/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	12	17	51	NA	
9	38	2/6/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	13	16	46	NA	
10	38	2/11/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	10	19	50	NA	
11	38	2/14/2013	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	15	14	48	NA	
12	38	2/14/2018	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	14	16	32	NA	
13	38	2/14/2020	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	14	14	29	NA	
14	38	2/14/2025	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	13	17	17	NA	
15	38	2/14/2027	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	15	16	44	NA	
16	38	3/4/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	12	17	25	NA	
17	38	3/6/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	13	16	29	NA	
18	38	3/11/2014	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	11	18	29	NA	
19	38	3/14/2013	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	15	16	41	NA	
20	38	3/14/2018	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	14	17	43	NA	
21	38	3/14/2020	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	14	14	42	NA	
22	38	3/14/2025	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	14	17	54	NA	
23	38	3/14/2027	Tamil Nadu	Chennai	Kathivakkam,	Tamilnadu	SoIndustrial Area:	15	19	62	NA	

24	38	4/1/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	14	15	66	NA
25	38	4/3/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	11	16	40	NA
26	38	4/8/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	14	17	56	NA
27	38	4/10/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	15	17	50	NA
28	38	4/14/2015	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	12	14	49	NA
29	38	4/14/2017	Tamil Nadu		Kathivakkam, Tamilnadu SolIndustrial Area:	15	16	63	NA
30	38	4/14/2022	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	15	18	42	NA
31	38	4/14/2029	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	12	18	44	NA
32	38	5/6/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	13	13	43	NA
33	38	5/8/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	14	14	48	NA
34	38	5/14/2013	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	14	13	63	NA
35	38	5/14/2015	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	12	15	119	NA
36	38	5/14/2020	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	13	18	61	NA
37	38	5/14/2027	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	12	16	48	NA
38	38	5/14/2029	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	10	16	52	NA
39	38	6/3/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	14	18	43	NA
40	38	6/5/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	12	15	53	NA
41	38	6/10/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	13	20	57	NA
42	38	6/12/2014	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	14	18	39	NA
43	38	6/14/2017	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	12	14	47	NA
44	38	6/14/2019	Tamil Nadu	Chennai	Kathivakkam, Tamilnadu SolIndustrial Area:	13	16	45	NA

Let us calculate the average AQI for each day in a specific location (e.g., Nagercoil) based on the provided data.

Python code:

```
import pandas as pd  
# Load air quality data from the CSV file  
data = pd.read_csv('air_quality_tamilnadu.csv')  
# Convert 'Timestamp' to datetime if it's not already in the correct format  
data['Timestamp'] = pd.to_datetime(data['Timestamp'])  
# Filter data for a specific location  
(e.g., Nagercoil)  
nagercoil_data = data[data['Location'] == 'Nagercoil']  
# Calculate daily average AQI for Nagercoil  
daily_avg_aqi_nagercoil = nagercoil_data.resample('D',  
on='Timestamp').mean()  
print("Daily Average AQI for Nagercoil:")  
print(daily_avg_aqi_nagercoil)
```

Explanation of code:

- We convert the timestamp column in the dataframe to a Pandas datetime format using `pd.to_datetime`.
- Using the `resample` function with a `daily(D)` frequency & the `mean` aggregation function, we calculate the daily average AQI for Chennai.
- It helps in grouping the data by day and computes the mean AQI for each day.