## 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:

	Α	8	c	D	E	E	G	H	1	1	K
1	Stn Code	Sampling Dat	State	City/Town	Vilocation of M	Agency	Type of Locati	502	NOZ	RSPM/PMID	PM 2.5
2	38	1/2/2014	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilled wistrial Area	11	17	55	NA
3	38	1/7/2014	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	13	17	45	NA
4	38	1/14/2021	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	12	18	50	NA
5	38	1/14/2023	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	15	16	46	NA
6	38	1/14/2028	Tamil Nadu	Chennai	Kathivakkam.	Tamilnadu	Standustrial Area	13	14	42	NA
7	38	1/14/1930	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	14	18	43	NA
8	3.8	2/4/2014	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	12	17	51	NA
9	38	2/6/2014	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	13	16	46	NA
10	38	2/11/2014	Tamil Nadu	Chennai	Kathivakkam.	Tamilnadu	Stilndustrial Are:	10	19	50	NA
11	38	2/14/2013	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	15	14	48	NA
12	38	2/14/2018	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	14	16	3.2	NA
13	3.8	2/14/2020	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	14	14	29	NA
14	38	2/14/2025	Tamil Nadu	Chennai	Kathivakkam.	Tamilnadu	Stilled u strial Are:	13	17	17	NA
15	38	2/14/2027	Tamil Nadu	Chennai	Kathivakkam.	Tamilnadu	Stilndustrial Are:	15	16	44	NA
16	38	3/4/2014	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	12	17	25	NA
17	3.8	3/6/2014	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	13	16	29	NA
18	58	3/11/2014	Tamil Nadu	Chennai	Kathivakkam.	Tamilnadu	Stilled u strial Are:	11	18	29	NA
19	18	3/14/2013	Tamil Nadu	Chennai	Kathivakkam.	Tamilnadu	Stilndustrial Are:	15	16	41	NA
20	38	3/14/2018	Tamil Nadu	Chennai	Kathivakkam	Taminadu	Stilndustrial Are:	14	17	43	NA
21	3.8	3/14/2020	Tamil Nadu	Chennai	Kathivakkam	Taminadu	Standustrial Area	14	14	42	NA
22	3.8	3/14/2025	Tamil Nadu	Chennai	Kathivakkam	Tamilnadu	Standustrial Area	14	17	54	NA
23	38	3/14/2027	Tamil Nadu	Chennai	Kathivakkam.	Taminadu	Stilndustrial Are:	15	19	62	NA

4.8	4/1/2014 Tamil Nadu	Chennai	Kathivakkam, Tamiinadu Stilndustrial Arec	14	15	66	NA
			Kathivakham, Tamilnadu Stilndustrial Are:	11	16	40	NA
		ARTHUR DESIGNATION OF THE PERSON	Kathivakham, Tamilnadu Stilndustrial Are:	14	17	56	NA
			Kathivakham, Tamilnadu Stilndustrial Arec	15	17	50	NA
- 333			Kathivakham, Tamilnadu Stilndustrial Ares	12	14	49	NA
- 49.8	and the second second property of the second		Kathivakkam, Tamilnadu Stilndustrial Are:	15	16	63	NA
	and the state of the property of the property of the state of the stat	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	15	18	42	NA
- 0.00			Kathivakham, Tamilnadu Stilndustrial Are:	12	18	44	NA
	5/6/2014 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Ares	13	13	43	NA
-0.07	5/8/2014 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Arei	14	14	48	NA
38	5/14/2013 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	14	13	63	NA
38	5/14/2015 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	12	15	119	NA
38	5/14/2020 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Ares	13	18	61	NA
38	5/14/2027 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Arei	12	16	48	NA
38	5/14/2029 Tamil Nadu	Chennai	Kathivakkam, Tamiinadu Stilndustrial Are:	10	16	52	NA
38	6/3/2014 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	14	18	43	NA
38	6/5/2014 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	12	15	53	NA
38	6/10/2014 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Ares	13	20	57	NA
38	6/12/2014 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Arei	14	18	39	NA
38	6/14/2017 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	12	14	47	NA
38	6/14/2019 Tamil Nadu	Chennai	Kathivakkam, Tamilnadu Stilndustrial Are:	13	16	45	NA
	5 8 5 8 5 8 5 8 5 8 5 8 5 8 5 8 5 8 5 8	38	38	38 4/3/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 4/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 4/10/2015 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 4/14/2017 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 4/14/2017 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 4/14/2027 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/6/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/6/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/14/2013 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/14/2015 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/14/2027 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/14/2027 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 5/14/2027 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/3/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/3/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are: 38 6/10/2014 Tamil Nadu Chennai Kathivakkam, Tamilnadu Stilndustrial Are:	38 4/3/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 11 38 4/8/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 4/10/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 15 38 4/14/2015 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 4/14/2017 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 15 38 4/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 15 38 4/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 5/6/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 5/8/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 5/14/2015 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 5/14/2020 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 5/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 5/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 5/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 5/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 12 38 5/14/2027 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 6/3/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 6/12/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 6/12/2014 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14 38 6/12/2017 Tamil Nadu Chennai Kashivakkam, Tamilnadu Stilndustrial Are: 14	38 4/3/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 11 16 38 4/8/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 14 17 38 4/10/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 15 17 38 4/14/2015 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 12 14 38 4/14/2017 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 15 18 38 4/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 15 18 38 4/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 12 18 38 5/6/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 13 13 38 5/14/2013 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 14 14 38 5/14/2015 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 14 13 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 14 13 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 14 13 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 12 15 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 14 18 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 16 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 16 38 5/14/2027 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 18 38 6/3/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 18 38 6/3/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 18 38 6/10/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 18 38 6/10/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 18 38 6/10/2014 Tamil Nadu Chennai Kathivakkam Tamilnadu Stilndu strial Are: 17 18	38

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 filedata =
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.