INDIA

AIR QUALITY INDEX ANALYSIS

Full form- AQI

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Objective

The Air Quality Monitoring System serves as an all-encompassing solution crafted to gather, store, and scrutinize air quality data derived from diverse monitoring stations situated across various states and cities. The primary objective of this initiative is to furnish valuable insights into the air quality across different regions. Such information proves instrumental for environmentalists, policymakers, and the public at large, empowering them to make well-informed decisions about health and environmental matters.

Table used

Air Quality

	serialnumber [PK] integer	state character varying (50)	city character varying (50)	stationname character varying (100)	currentaqivalue double precision
1	1	Andhra Pradesh	Amaravati	Secretariat, Amaravati -...	135
2	2	Andhra Pradesh	Anantapur	Gulzarpet, Anantapur - ...	62
3	3	Andhra Pradesh	Chittoor	Gangineni Cheruvu, Chi...	30
4	4	Andhra Pradesh	Eluru	Eluru - APPCB	95
5	5	Andhra Pradesh	Guntur	Collectorate, Guntur - A...	84
6	6	Andhra Pradesh	Kadapa	RTC Bus Stand, Kadapa...	102
7	7	Andhra Pradesh	Kakinada	LMD Colony, Kakinada -...	54
8	8	Andhra Pradesh	Kurnool	Gandhi Nagar, Kurnool ...	44
9	9	Andhra Pradesh	Nellore	ZP Office, Nellore - AP...	72
10	10	Andhra Pradesh	Ongole	Ongole - APPCB	88
11	11	Andhra Pradesh	Rajamahendravaram	RTC Complex, Rajamah...	73
12	12	Andhra Pradesh	Srikakulam	New RTC Bus Stand, Sri...	45
13	13	Andhra Pradesh	Tirupati	Tirupati - APPCB	107
14	14	Andhra Pradesh	Vijayawada	Income Tax Office, Vija...	97
15	15	Andhra Pradesh	Visakhapatnam	GVM Corporation Offic...	106
16	16	Andhra Pradesh	Vizianagaram	Vizianagaram - APPCB	23
17	17	Andhra Pradesh	Yemmiganur	Yemmiganur - APPCB	83

01 Retrieve all records for a specific city (e.g., Mumbai).

```
select * from airquality
where city = 'Mumbai'
```

	serialnumber [PK] integer	state character varying (50)	city character varying (50)	stationname character varying (100)	currentaqivalue double precision
1	108	Maharashtra	Mumbai	BKC, Mumbai - MPCB	151
2	291	Maharashtra	Mumbai	Bandra, Mumbai - MPCB	212
3	413	Maharashtra	Mumbai	Worli, Mumbai - MPCB	196

02 Find The average AQI value for each state.

```
SELECT
  state,
  AVG(currentaqivalue) AS avg_aqi
FROM
  airquality
GROUP BY
  state;
```

state character varying (50)	avg_aqi double precision
Dadra and Nagar Haveli and Daman and Diu	69
Uttarakhand	77.41666666666667
Rajasthan	118.03703703703704
Jharkhand	97.6
Maharashtra	121.7872340425532
Lakshadweep	29.9
Bihar	124
Gujarat	122
Punjab	123.875
Puducherry	41.666666666666664

03 Identify cities where AQI is above a certain threshold (e.g., AQI>200).

```
select city, currentaqivalue
from airquality
where currentaqivalue>200;
```

	city character varying (50)	currentaqivalue double precision
1	Delhi	318
2	Faridabad	204
3	Ghaziabad	315
4	Noida	239
5	Delhi	262
6	Ahmedabad	292
7	Surat	241
8	Faridabad	272
9	Gurugram	277
10	Kalyan	215
11	Mumbai	212

04

Count the number of records with insufficient data?

```
select count(*) as Insufficent_datacount
from airquality
where currentaqivalue is null;
```

	insufficent_datacount bigint
1	0

05

Find the highest AQI value along with the corresponding city and state.

```
select state,city,currentaqivalue
from airquality
order by currentaqivalue desc
limit 1;
```

	state character varying (50)	city character varying (50)	currentaqivalue double precision
1	Delhi	Delhi	318

06 Calculate the overall average AQI for the entire dataset.

```sql
select avg(currentaqivalue) as overall_avg_aqi
from airquality;
```

	overall_avg_aqi double precision
1	96.05208333333333

07 Retrieve records for states with more than five city.

```
select State, count(distinct City)
from  airquality
group by State
Having count(distinct City) >5;
```

	state character varying (50)	count bigint
1	Andhra Pradesh	17
2	Gujarat	12
3	Haryana	19
4	Himachal Pradesh	12
5	Karnataka	19
6	Kerala	9
7	Lakshadweep	10
8	Madhya Pradesh	8

08 Find the cities in a specific state with AQI less than 50?

```
select State, City, currentaqivalue
from airquality
where currentaqivalue<50
order by currentaqivalue ;
```

state character varying (50)	city character varying (50)	currentaqivalue double precision
Kerala	Alappuzha	20
Mizoram	Aizawl	21
Andhra Pradesh	Vizianagaram	23
Lakshadweep	Chetlat	27
Lakshadweep	Chetlat	27
Andaman and Nicobar Islands	Port Blair	27
Lakshadweep	Andrott	27
Lakshadweep	Chetlat	27
Lakshadweep	Andrott	27
Meghalaya	Shillong	27

09

Categorize AQI values into dofferent pollution levels?

```
select city, currentaqivalue,
case
 when currentaqivalue <= 50 then 'Good'
 when currentaqivalue <= 100 then 'Moderate'
 when currentaqivalue <= 150 then 'Unhealthy for sensitive group'
 when currentaqivalue <= 200 then 'Unhealthy'
 when currentaqivalue <= 300 then 'Very unhealthy'
 else 'Hazardous'

end as pollution_level
from airquality
```

city character varying (50)	currentaqivalue double precision	pollution_level text
Amaravati	135	Unhealthy for sensitive group
Anantapur	62	Moderate
Chittoor	30	Good
Eluru	95	Moderate
Guntur	84	Moderate
Kadapa	102	Unhealthy for sensitive group
Kakinada	54	Moderate
Kurnool	44	Good
Nellore	72	Moderate
Ongole	88	Moderate
Rajamahendravaram	73	Moderate

10 Find cities with the lowest AQI values in each state and rank them.

```
select state, city,currentaqivalue,
rank() over (partition by state order by currentaqivalue) as lowest_aqi_rnk
from airquality
```

	state character varying (50)	city character varying (50)	currentaqivalue double precision	lowest_aqi_rnk bigint
1	Andaman and Nicobar Islands	Port Blair	27	1
2	Andaman and Nicobar Islands	Port Blair	32	2
3	Andhra Pradesh	Vizianagaram	23	1
4	Andhra Pradesh	Chittoor	30	2
5	Andhra Pradesh	Kurnool	44	3
6	Andhra Pradesh	Srikakulam	45	4
7	Andhra Pradesh	Kakinada	54	5
8	Andhra Pradesh	Anantapur	62	6
9	Andhra Pradesh	Nellore	72	7
10	Andhra Pradesh	Rajamahendravaram	73	8
11	Andhra Pradesh	Yemmiganur	83	9
12	Andhra Pradesh	Guntur	84	10

11 Retrieve the states where the highest pollution level is recorded and the corresponding pollution level.

```
select state, max(currentaqivalue) as highest_polution
from airquality
group by state;
```

	state character varying (50)	highest_polution double precision
1	Dadra and Nagar Haveli and Daman and Diu	100
2	Uttarakhand	97
3	Rajasthan	181
4	Jharkhand	125
5	Maharashtra	218
6	Lakshadweep	33
7	Bihar	146
8	Gujarat	292
9	Punjab	172
10	Puducherry	47

12 Identify the stations where the pollution level is higher than the average pollution level across all stations.

```sql
SELECT state, currentaqivalue
FROM airquality
WHERE currentaqivalue > (SELECT AVG(currentaqivalue) FROM airquality);
```

state character varying (50)	currentaqivalue double precision
Andhra Pradesh	135
Andhra Pradesh	102
Andhra Pradesh	107
Andhra Pradesh	97
Andhra Pradesh	106
Assam	112
Assam	99
Bihar	113
Bihar	108
Bihar	117

12 Retrieve the names and pollution levels of stations in the National Capital Region (NCR).

```
SELECT state ,currentaqivalue
FROM airquality
WHERE City IN ('Delhi', 'Ghaziabad', 'Noida', 'Gurugram', 'Faridabad');
```

city character varying (50)	currentaqivalue double precision
Delhi	318
Faridabad	204
Gurugram	190
Ghaziabad	315
Noida	239
Delhi	262
Faridabad	272
Gurugram	277
Ghaziabad	289
Noida	264

13

Find the monitoring stations in South India (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana) with pollution levels greater than 100.

```
select state, currentaqivalue
from airquality
where state in ('Andhra Pradesh','Karnataka','Kerala','Tamil Nadu','Telangana')
and currentaqivalue > 100;
```

state character varying (50)	currentaqivalue double precision
Andhra Pradesh	135
Andhra Pradesh	102
Andhra Pradesh	107
Andhra Pradesh	106
Tamil Nadu	109
Telangana	128
Telangana	119
Telangana	114
Telangana	103

14 Find the states with the highest and lowest average pollution levels.

```sql
SELECT State, AVG(currentaqivalue) as avg_pollution
FROM airquality
GROUP BY State,currentaqivalue
ORDER BY avg_pollution desc,state
LIMIT 1;
```

	state character varying (50)	highest_pollution double precision
1	Delhi	318

15 Find the states with the lowest average pollution levels.

```
ELECT State, AVG(currentaqivalue) as lowest_pollution
ROM airquality
ROUP BY State,currentaqivalue
RDER BY lowest_pollution,state
IMIT 1;
```

	state character varying (50)	lowest_pollution double precision
1	Kerala	20

SQL PROJECT

THANK YOU

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