



Task 2 Corona Virus Analysis with SQL

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Project Overview

- The COVID-19 pandemic has prompted a critical need for datadriven insights to comprehend the virus's spread.
- As a data analyst, the task at hand is to analyze a COVID-19 dataset to extract valuable insights.
- Through data exploration and statistical analysis, the aim is to uncover patterns, trends, and correlations within the dataset.
- By presenting these findings, the agenda is to contribute to the collective effort in combating the COVID-19 crisis.



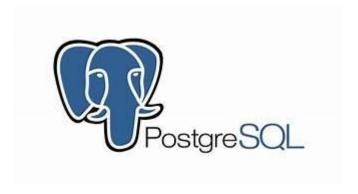
Dataset Overview

Description of each column in the dataset (Corona Virus Dataset)

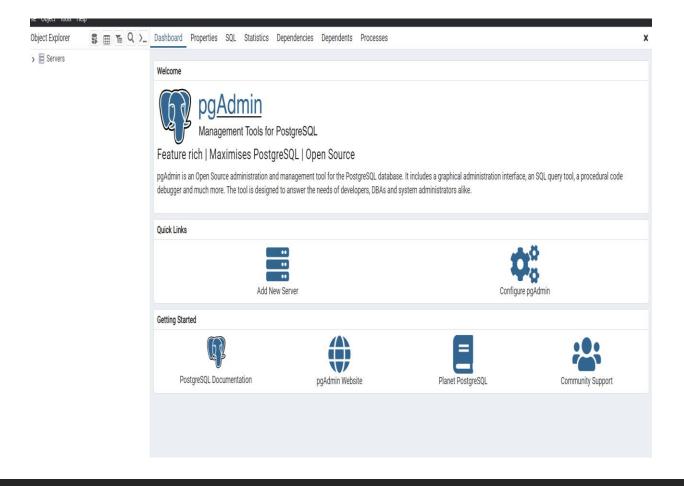
- Province: Geographic subdivision within a country/region.
- Country_Region: Geographic entity where data is recorded.
- Latitude: North-south position on Earth's surface.
- Longitude: East-west position on Earth's surface.
- Date: Recorded date of CORONA VIRUS data.
- Confirmed: Number of diagnosed CORONA VIRUS cases.
- Deaths: Number of CORONA VIRUS-related deaths.
- Recovered: Number of recovered CORONA VIRUS cases

Database Setup and Tool Used

Database Used:

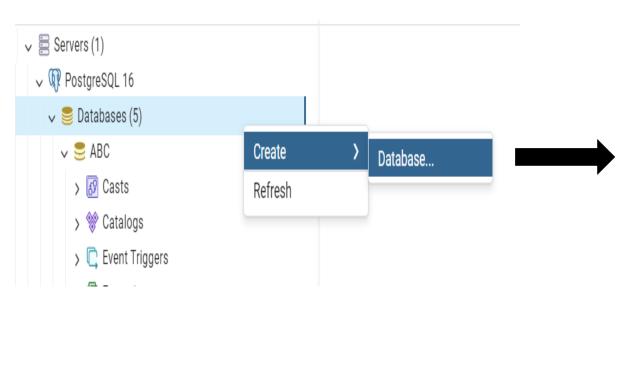


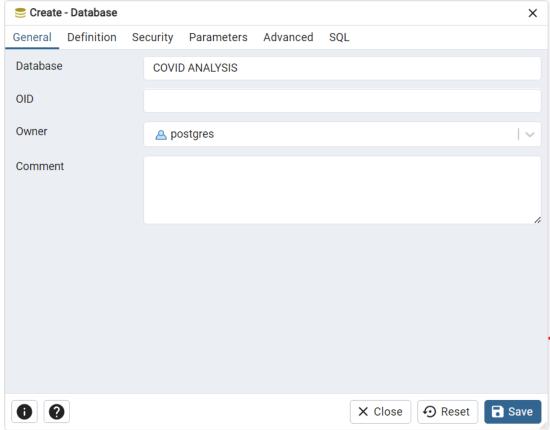
Management Tool: pgAdmin 4



Database Setup

To create "COVID ANALYSIS" database:



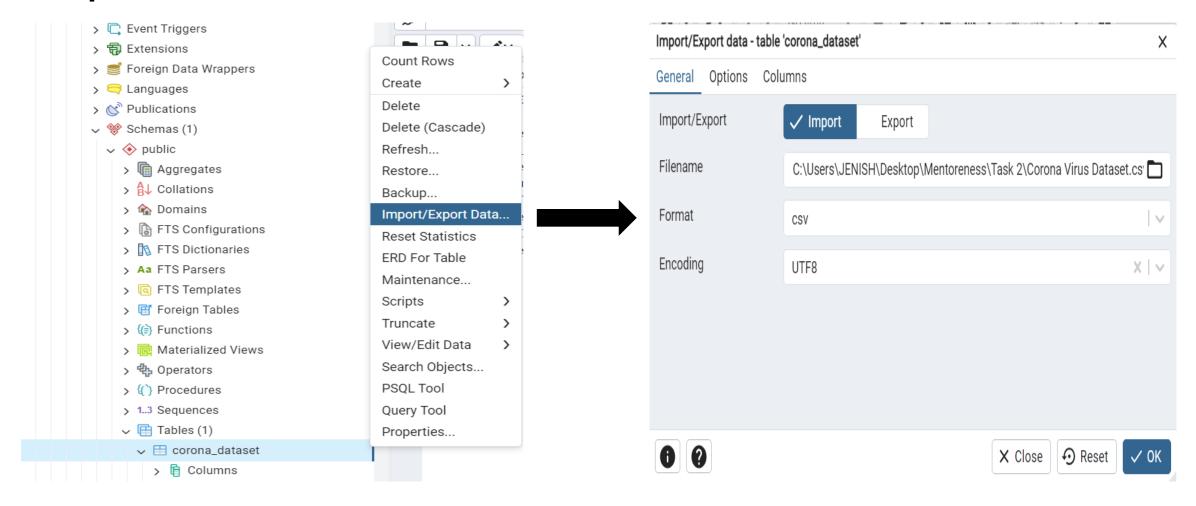


Database Setup and Table Creation

To create a table:

```
Query History
Query
  CREATE TABLE corona_dataset
2
3
        Province VARCHAR(50),
        Country_Region VARCHAR(50),
        Latitude FLOAT,
6
        Longtitude FLOAT,
7
        Date DATE,
        Confirmed INT,
8
        Deaths INT,
10
        Recovered INT
11
```

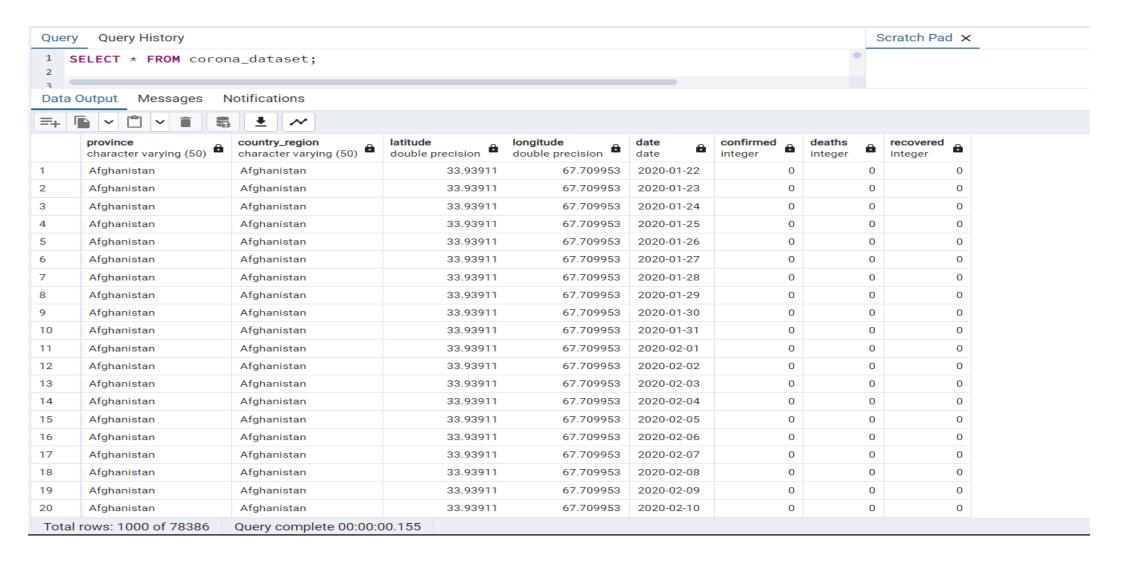
Import Data into the Table



Right Click the table we just created and choose "Import/Export Data – Table"

Navigate the File Path in the FileName section which leads to the desired file

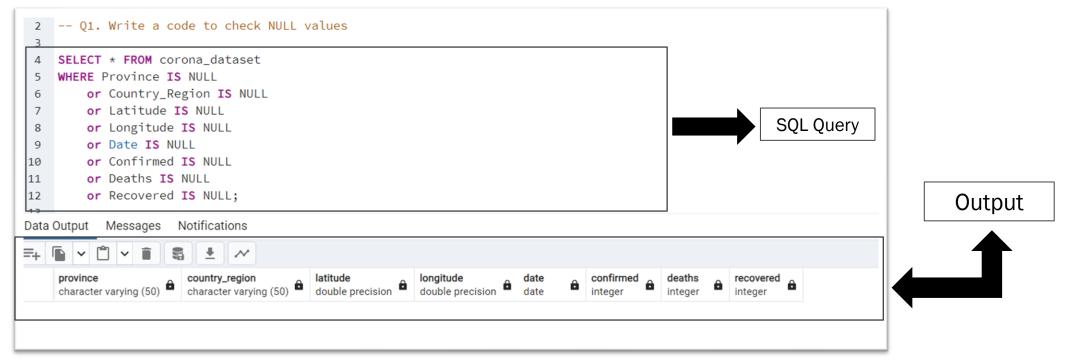
Display the Imported Data



Data Cleaning

To avoid any errors going forward, lets check if there are any missing value / null value.

Q1. Write a code to check NULL values.



Inference: Based on the output, it could be rest assured that there are **no null values** present in any columns within the dataset.

Q2. If NULL values are present, update them with zeros for all columns.

As we have seen already, there were no null values present in the dataset, but if the values were null, we could have addressed them using the below query.

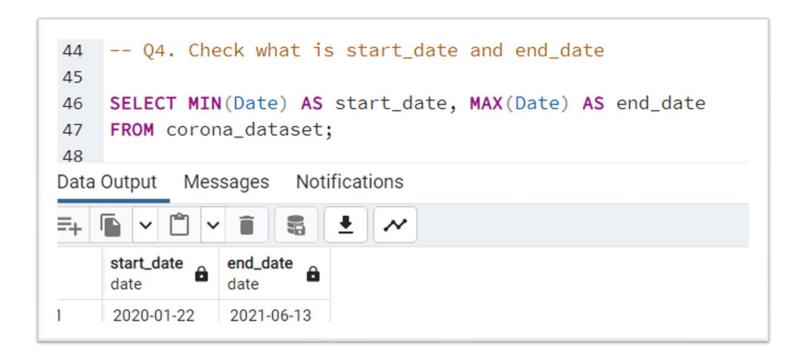
```
UPDATE corona_dataset
SET
    Province = COALESCE(Province, 'NOT AVAILABLE'),
    Country_Region = COALESCE(Country_Region, 'NOT AVAILABLE'),
    Latitude = COALESCE(Latitude, 0.0),
    Longitude = COALESCE(Longitude, 0.0),
    Date = COALESCE(Date, CURRENT_DATE),
    Confirmed = COALESCE(Confirmed, 0),
    Deaths = COALESCE(Deaths, 0),
    Recovered = COALESCE(Recovered, 0);
```

Q3. Check total number of rows.



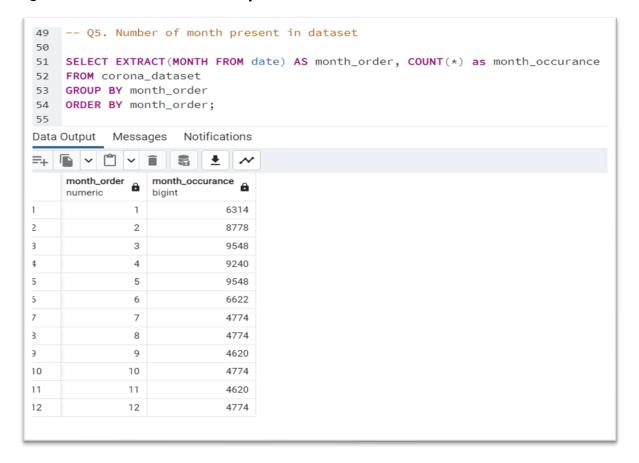
Inference: The total number of records stored inside our dataset is 78,386.

Q4. Check what is start_date and end_date



Inference: As per this data, it is evident that the records the dataset was able to collect start from January 22, 2020 (22-01-2020) and the end date noted was June 13, 2021 (13-06-2021).

Q5. Number of month present in dataset.



month_order = 1, it has month_occurance value as 6314 depicting there were 6314 occurrence of COVID-19 reported across various countries, during the month of

January during the year 2020-2021.

To cite an example, considering January as

Inference: The dataset includes 12 distinct months

 In the output, "month_order" represents distinct months from JAN to DEC in numeric form, whereas the column "month_occurance" is associated with number of cases or reports witnessed in that respective month. Q6. Find monthly average for confirmed, deaths, recovered.

```
-- Q6. Find monthly average for confirmed, deaths, recovered

SELECT

EXTRACT(MONTH FROM Date) as month_no,

EXTRACT(YEAR FROM Date) as Year,

ROUND(AVG(Confirmed),2) AS avg_confirmed,

ROUND(AVG(Deaths),2) AS avg_deaths,

ROUND(AVG(Recovered),2) AS avg_recovered

FROM

corona_dataset

GROUP BY

Year, month_no

ORDER BY

Year, month_no;
```

Inference: Based on the output provided, it is apparent that the highest average values for confirmed cases, deaths, and recovered cases are as follows:

Confirmed cases: 4699.36 in April 2021

Deaths: 84.18 in January 2021

Recovered cases: 4007.51 in May 2021

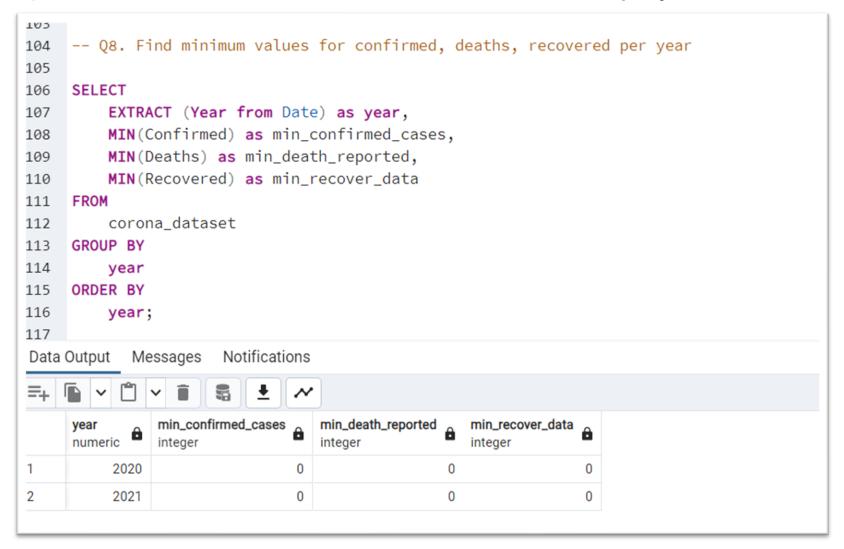
	month_no numeric	year numeric	avg_confirmed numeric	avg_deaths numeric	avg_recovered numeric
1	1	2020	4.15	0.12	0.09
2	2	2020	15.30	0.59	7.03
3	3	2020	161.13	8.66	27.87
4	4	2020	505.80	41.52	171.64
5	5	2020	574.85	30.28	318.30
6	6	2020	859.23	29.82	548.79
7	7	2020	1432.36	35.11	983.06
8	8	2020	1611.84	37.54	1299.29
9	9	2020	1784.59	34.78	1438.91
10	10	2020	2412.20	36.76	1420.64
11	11	2020	3592.19	56.76	1985.34
12	12	2020	4050.44	71.22	2497.89
13	1	2021	3911.23	84.18	1919.64
14	2	2021	2433.36	69.16	1558.39
15	3	2021	2916.80	59.20	1652.29
16	4	2021	4699.36	78.44	3074.79
17	5	2021	4005.25	76.78	4007.51
18	6	2021	2508.63	66.26	2769.45

Q7. Find most frequent value for confirmed, deaths, recovered each month.

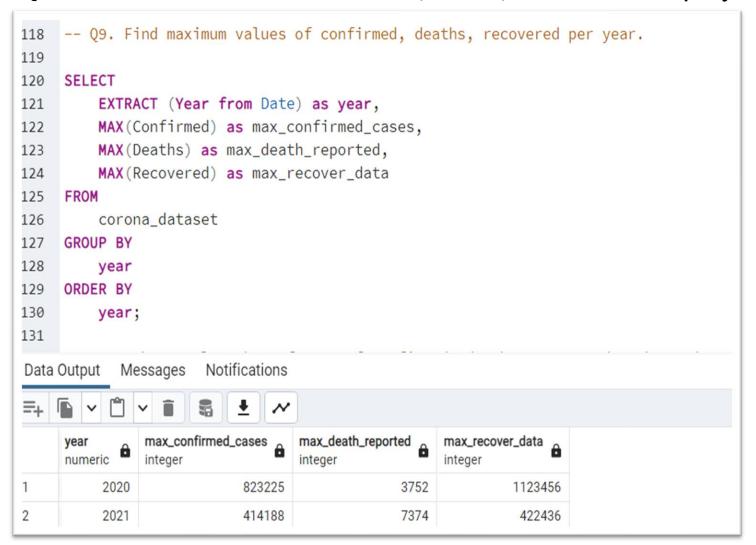
```
-- Q7. Find most frequent value for confirmed, deaths, recovered each month
WITH FrequentData AS (
   SELECT
       EXTRACT(MONTH FROM Date) as month_no,
       EXTRACT(YEAR FROM Date) as year,
       Confirmed,
       Deaths,
       Recovered,
       RANK() OVER (PARTITION BY EXTRACT(MONTH FROM Date), EXTRACT(YEAR FROM Date) ORDER BY COUNT(*) DESC) as rank
   FROM
       corona_dataset
   GROUP BY
       EXTRACT(MONTH FROM Date), EXTRACT(YEAR FROM Date), Confirmed, Deaths, Recovered
SELECT
   month_no,
   year,
   Confirmed,
   Deaths,
   Recovered
FROM
   FrequentData
WHERE
   rank = 1
ORDER BY
   year, month_no;
```

	month_no numeric	year numeric	confirmed integer	deaths integer	recovered integer
1	1	2020	0	0	0
2	2	2020	0	0	0
3	3	2020	0	0	0
4	4	2020	0	0	0
5	5	2020	0	0	0
6	6	2020	0	0	0
7	7	2020	0	0	0
8	8	2020	0	0	0
9	9	2020	0	0	0
10	10	2020	0	0	0
11	11	2020	0	0	0
12	12	2020	0	0	0
13	1	2021	0	0	0
14	2	2021	0	0	0
15	3	2021	0	0	0
16	4	2021	0	0	0
17	5	2021	0	0	0
18	6	2021	0	0	0

Q8. Find minimum values for confirmed, deaths, recovered per year.



Q9. Find maximum values of confirmed, deaths, recovered cases per year.



Inference:

- The year 2020 accounts for the most confirmed cases with the figures of 823,225.
- In contrary, it is surprising that despite confirmed cases being half in 2021, 2021 accounts for the most deaths which were 7374 reported during this span.
- However, the maximum recovered were witnessed in 2020, with the figures of 1,123,456 accounting for their recovery.

Q10. The total number of case of confirmed, deaths, recovered each month.

```
-- Q10. The total number of case of confirmed, deaths, recovered each month

SELECT

EXTRACT (MONTH from Date) as month_no,

EXTRACT (YEAR from Date) as year,

SUM(Confirmed) as total_confirmed_cases,

SUM(Deaths) as total_death_reported,

SUM(Recovered) as total_recover_data

FROM

corona_dataset

GROUP BY

year, month_no

ORDER BY

year, month_no;
```

Inference:

- With a cumulative count of 21,711,021 cases, the number of confirmed cases peaked in April 2021.
- In contrast, January 2021 saw the most number of deaths recorded as 401,893.
- Additionally, May 2021 reported the highest number of recovered cases, which came to 19,131,842.

	month_no numeric	year numeric	total_confirmed_cases bigint	total_death_reported bigint	total_recover_data bigint
1	1	2020	6384	190	143
2	2	2020	68312	2651	31405
3	3	2020	769236	41346	133070
4	4	2020	2336798	191833	792987
5	5	2020	2744333	144561	1519547
6	6	2020	3969634	137757	2535417
7	7	2020	6838092	167613	4693120
8	8	2020	7694938	179200	6202833
9	9	2020	8244794	160671	6647749
10	10	2020	11515841	175484	6782150
11	11	2020	16595938	262247	9172292
12	12	2020	19336799	339996	11924903
13	1	2021	18672205	401893	9164347
14	2	2021	10492664	298239	6719785
15	3	2021	13924790	282620	7888013
16	4	2021	21711021	362387	14205507
17	5	2021	19121083	366549	19131842
18	6	2021	5022282	132657	5544438

Q11. Check how corona virus spread out with respect to confirmed cases per month. (Eg.: total confirmed cases, their average, variance & STDEV)

```
-- Q11. Check how corona virus spread out with respect to confirmed case per month
        (Eg.: total confirmed cases, their average, variance & STDEV )
SELECT
    EXTRACT(MONTH from Date) as month_no,
    EXTRACT(YEAR from Date) as year,
    SUM(Confirmed) as total_confirmed_cases,
    ROUND(AVG(Confirmed),2) as avg_confirmed_cases,
    ROUND(VARIANCE(Confirmed),2) as var_confirmed_cases,
    ROUND(STDDEV(Confirmed),2) as std_confirmed_cases
FROM
    corona_dataset
GROUP BY
   year, month_no
Order by
    year, month_no;
```

	month_no numeric	year numeric 🔓	total_confirmed_cases bigint	avg_confirmed_cases numeric	var_confirmed_cases numeric	std_confirmed_cases numeric
1	1	2020	6384	4.15	4836.05	69.54
2	2	2020	68312	15.30	78507.03	280.19
3	3	2020	769236	161.13	1026629.22	1013.23
4	4	2020	2336798	505.80	7013581.36	2648.32
5	5	2020	2744333	574.85	6064850.73	2462.69
6	6	2020	3969634	859.23	13782194.73	3712.44
7	7	2020	6838092	1432.36	46923851.93	6850.10
8	8	2020	7694938	1611.84	54419982.40	7376.99
9	9	2020	8244794	1784.59	69329705.03	8326.45
10	10	2020	11515841	2412.20	69002612.88	8306.78
11	11	2020	16595938	3592.19	195858271.38	13994.94
12	12	2020	19336799	4050.44	459981798.11	21447.19
13	1	2021	18672205	3911.23	316370963.72	17786.82
14	2	2021	10492664	2433.36	79606383.04	8922.24
15	3	2021	13924790	2916.80	83742806.92	9151.11
16	4	2021	21711021	4699.36	501121674.28	22385.75
17	5	2021	19121083	4005.25	628779318.45	25075.47
18	6	2021	5022282	2508.63	110988215.34	10535.09

Q12. Check how corona virus spread out with respect to death cases per month. (Eg.: total death cases, their average, variance & STDEV)

```
183 -- Q12. Check how corona virus spread out with respect to death case per month
            (Eg.: total death cases, their average, variance & STDEV)
184 --
185
    SELECT
186
         EXTRACT (MONTH from Date) as month_no,
187
         EXTRACT(YEAR from Date) as year,
188
         SUM(Deaths) as total_death_reported,
189
         ROUND(AVG(Deaths),2) as avg_death_reported,
190
         ROUND(VARIANCE(Deaths),2) as var_death_reported,
191
192
         ROUND(STDDEV(Deaths),2) as std_death_reported
193 FROM
         corona_dataset
194
    GROUP BY
195
         year, month_no
196
197
    Order by
         year, month_no;
198
```

	month_no numeric	year numeric 🏻	total_death_reported bigint	avg_death_reported numeric	var_death_reported numeric	std_death_reported numeric
1	1	2020	190	0.12	4.25	2.06
2	2	2020	2651	0.59	68.34	8.27
3	3	2020	41346	8.66	3901.61	62.46
4	4	2020	191833	41.52	40513.04	201.28
5	5	2020	144561	30.28	20689.25	143.84
6	6	2020	137757	29.82	16933.11	130.13
7	7	2020	167613	35.11	21144.58	145.41
8	8	2020	179200	37.54	23277.87	152.57
9	9	2020	160671	34.78	20107.12	141.80
10	10	2020	175484	36.76	17583.75	132.60
11	11	2020	262247	56.76	27779.81	166.67
12	12	2020	339996	71.22	65359.06	255.65
13	1	2021	401893	84.18	102779.96	320.59
14	2	2021	298239	69.16	68494.76	261.72
15	3	2021	282620	59.20	54397.36	233.23
16	4	2021	362387	78.44	94631.95	307.62
17	5	2021	366549	76.78	131797.08	363.04
18	6	2021	132657	66.26	113020.13	336.18

Q13. Check how corona virus spread out with respect to recovered cases per month. (Eg.: total recovered cases, their average, variance & STDEV)

```
101 -- Q13. Check how corona virus spread out with respect to recovered case per month
            (Eg.: total recovered cases, their average, variance & STDEV )
203
204 SELECT
        EXTRACT(MONTH from Date) as month_no,
205
        EXTRACT(YEAR from Date) as year,
206
        SUM(Recovered) as total_recover_data,
207
        ROUND(AVG(Recovered),2) as avg_recover_data,
208
209
        ROUND(VARIANCE(Recovered),2) as var_recover_data,
210
        ROUND(STDDEV(Recovered),2) as std_recover_data
P11 FROM
212
        corona_dataset
213 GROUP BY
        year, month_no
214
215 Order by
        year, month_no;
216
```

	month_no numeric	year numeric 🏻 🖨	total_recover_data bigint	avg_recover_data numeric	var_recover_data numeric	std_recover_data numeric
1	1	2020	143	0.09	2.64	1.62
2	2	2020	31405	7.03	12449.45	111.58
3	3	2020	133070	27.87	40121.59	200.30
4	4	2020	792987	171.64	770059.71	877.53
5	5	2020	1519547	318.30	1978620.88	1406.63
6	6	2020	2535417	548.79	6531586.26	2555.70
7	7	2020	4693120	983.06	24849082.94	4984.89
8	8	2020	6202833	1299.29	40178838.38	6338.68
9	9	2020	6647749	1438.91	57035911.88	7552.21
10	10	2020	6782150	1420.64	73747150.17	8587.62
11	11	2020	9172292	1985.34	50738601.25	7123.10
12	12	2020	11924903	2497.89	326763170.52	18076.59
13	1	2021	9164347	1919.64	31500298.42	5612.51
14	2	2021	6719785	1558.39	24433077.90	4942.98
15	3	2021	7888013	1652.29	34904703.06	5908.02
16	4	2021	14205507	3074.79	224468171.33	14982.26
17	5	2021	19131842	4007.51	755333749.97	27483.34
18	6	2021	5544438	2769.45	233150866.36	15269.28

Q14. Find Country having highest number of the Confirmed case.



Inference: US had the highest number of confirmed cases recorded which was cumulated to 33,461,982.

Q15. Find Country having lowest number of the death cases.

```
247 -- Q15. Find Country having lowest number of the death cases.
248
    WITH rankingCountry as (
249
250
         SELECT
             country_region as Country,
251
252
             SUM(Deaths) as total_death_reported,
253
             RANK() Over(ORDER by SUM(Deaths) ASC) as rank_no
254
         FROM
             corona_dataset
255
         GROUP BY
256
257
             Country
258
    SELECT
259
260
         Country,
         total_death_reported
261
     FROM
262
         rankingCountry
263
264
     WHERE
         rank_no = 1;
265
266
```

	country character varying (50)	total_death_reported bigint
1	Samoa	0
2	Kiribati	0
3	Dominica	0
4	Marshall Islands	0

Inference: Samoa, Kiribati, Dominica, and Marshall Islands had reported the lowest number of death cases, which each country had 0 casualties as per the datasets.

Q16. Find top 5 countries having highest recovered cases.

```
267 -- Q16. Find top 5 countries having highest recovered cases.
268
269
    SELECT
         country_region AS Country,
270
         SUM(Recovered) AS total_recovered_data
271
272
    FROM
273
         corona_dataset
274
     GROUP BY
         Country
275
276
     ORDER BY total_recovered_data DESC
277
     limit 5;
278
```

	country character varying (50)	total_recovered_data bigint
1	India	28089649
2	Brazil	15400169
3	US	6303715
4	Turkey	5202251
5	Russia	4745756

Inference: India recorded the most recovery as per the dataset with its number summing up to 28,089,649, whereas Brazil and US are 2nd and 3rd best, followed by Turkey and Russia respectively

Insights

Several revelations have been discovered after the SQL analysis of the COVID dataset.

- 1. According to the dataset COVID-19 Pandemic duration was from January 22, 2020, to June 13, 2021.
- 2. Though 2020 had the most number of cases recorded, the amount of casualties recorded was more in 2021.
- 3. India had the highest number of recovered cases.
- 4. The confirmed cases skyrocketed in April 2021.
- 5. Samoa, Kiribati, Dominica, and Marshall Islands had reported the lowest number of death cases.
- 6. Though the US was the most recorded country with confirmed cases, it comes 3rd in the case of recovery data which was accumulated in the dataset.

These datasets provide valuable insights for understanding the impact COVID pandemic caused based on the dataset.

Thank You!!!