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ISYS1055 (Practical) Database Concepts

Assessment 4: - Database Design Project

Part D: - Data Retrieval and Visualisation

Task D.1

Query:-

```
SELECT
country_name AS "Country Name (CN)",
'29th December 2020' AS "Date 1 (OD1)",
COALESCE(SUM(CASE WHEN date = '29/12/2020' THEN total_vaccinations END), 0) AS "Vaccine on OD1 (VOD1)",
'9th January 2021' AS "Date 2 (OD2)",
COALESCE(SUM(CASE WHEN date = '09/01/2021' THEN total_vaccinations END), 0) AS "Vaccine on OD2 (VOD2)",
'7th February 2021' AS "Date 3 (OD3)",
COALESCE(SUM(CASE WHEN date = '07/02/2021' THEN total_vaccinations END), 0) AS "Vaccine on OD3 (VOD3)",
COALESCE(
((COALESCE(SUM(CASE WHEN date = '09/01/2021' THEN total_vaccinations END), 0)
- COALESCE(SUM(CASE WHEN date = '29/12/2020' THEN total_vaccinations END), 0))
/ NULLIF(COALESCE(SUM(CASE WHEN date = '29/12/2020' THEN total_vaccinations END), 0), 0) * 100), 0)
+ COALESCE(
((COALESCE(SUM(CASE WHEN date = '07/02/2021' THEN total_vaccinations END), 0)
- COALESCE(SUM(CASE WHEN date = '09/01/2021' THEN total_vaccinations END), 0))
/ NULLIF(COALESCE(SUM(CASE WHEN date = '09/01/2021' THEN total_vaccinations END), 0), 0) * 100), 0)
AS "Percentage change of totals"
FROM Vaccination_by_manu
WHERE date IN ('29/12/2020', '09/01/2021', '07/02/2021')
GROUP BY country_name
ORDER BY "Percentage change of totals" DESC;
```

Snapshot:-

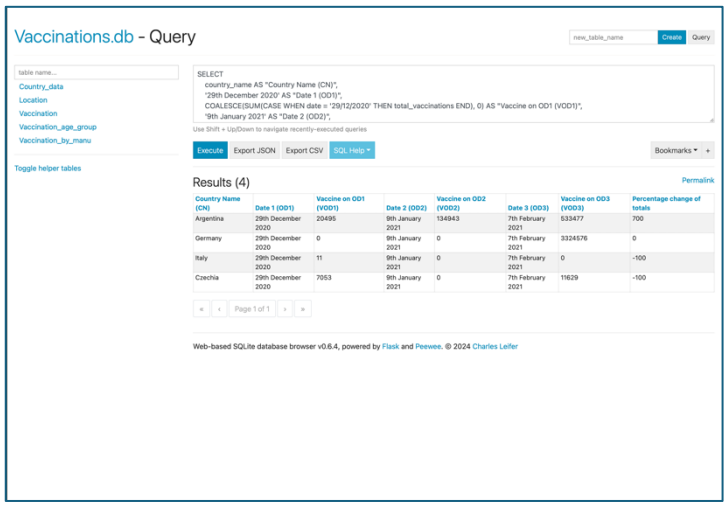


Fig 1:- Screenshot for showing queries are injected to the SQLite web

Visualization:

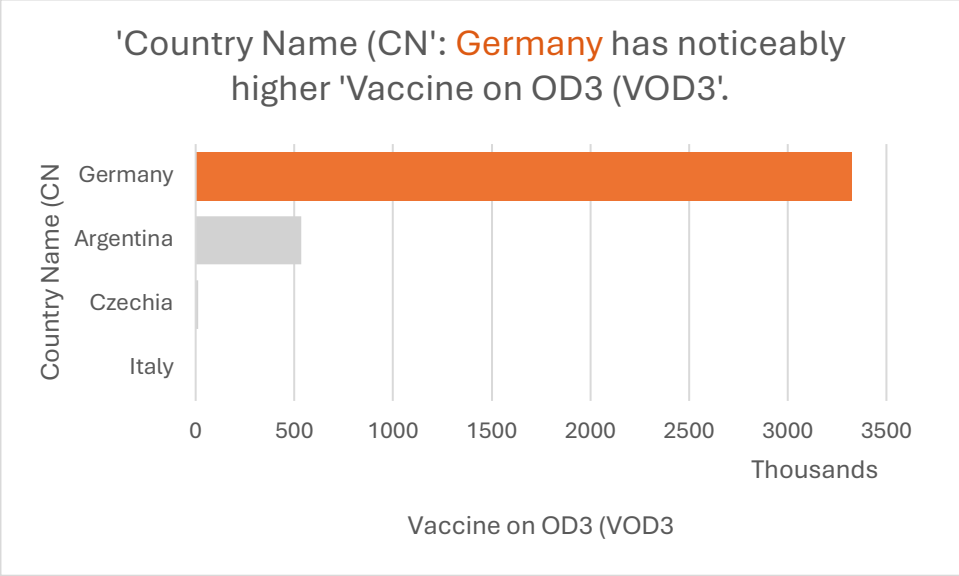


Fig 2: - Number of vaccination doses on 7th February 2021

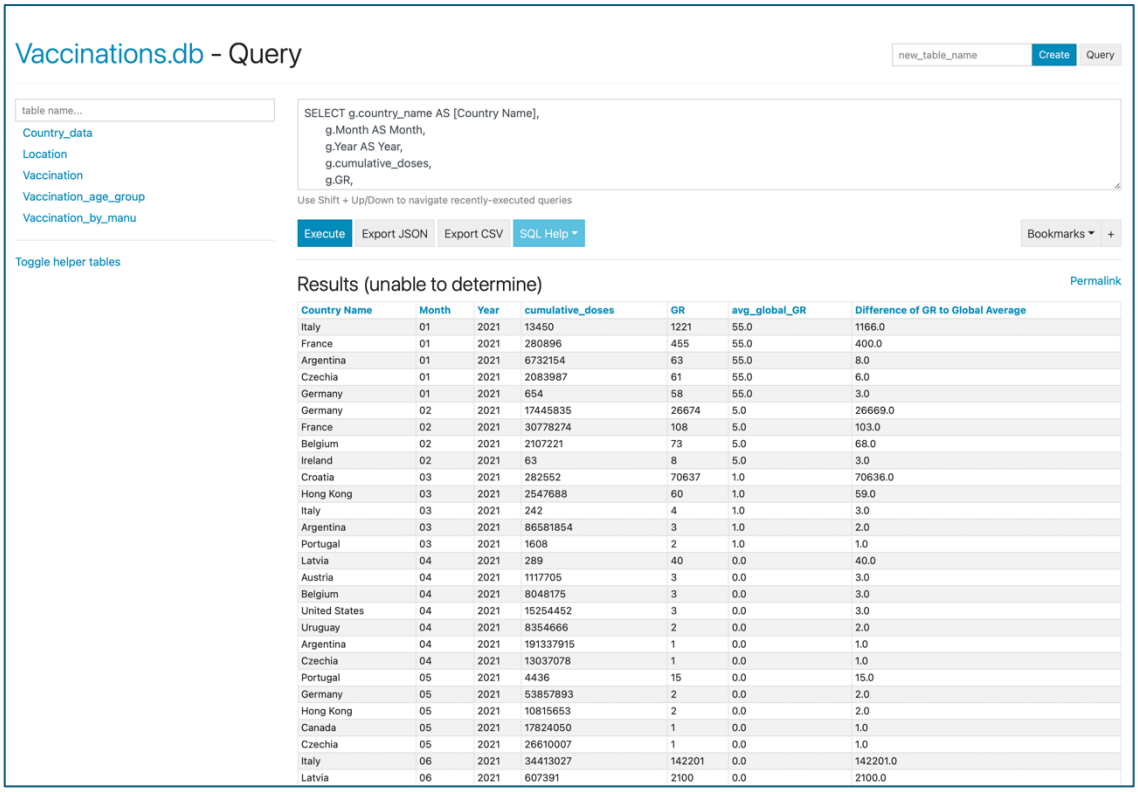
Task D.2:-

Query:-

```
SELECT g.country_name AS [Country Name],
g.Month AS Month,
g.Year AS Year,
g.cumulative_doses,
g.GR,
ga.avg_global_GR,
(g.GR - ga.avg_global_GR) AS [Difference of GR to Global Average]
FROM (
SELECT country_name,
substr(date, 7, 4) AS Year,
substr(date, 4, 2) AS Month,
SUM(total_vaccinations) AS cumulative_doses,
(SUM(total_vaccinations) - LAG(SUM(total_vaccinations) ) OVER (PARTITION BY country_name
ORDER BY substr(date, 7, 4),
substr(date, 4, 2) ) ) / NULLIF(LAG(SUM(total_vaccinations) ) OVER (PARTITION BY
country_name ORDER BY substr(date, 7, 4),
substr(date, 4, 2) ), 0) AS GR
FROM Vaccination_by_manu
GROUP BY country_name,
Year,
Month
)
AS g
JOIN
(
SELECT substr(date, 7, 4) AS Year,
substr(date, 4, 2) AS Month,
AVG(GR) AS avg_global_GR
```

```
FROM (
SELECT date,
substr(date, 7, 4) AS Year,
substr(date, 4, 2) AS Month,
(SUM(total_vaccinations) - LAG(SUM(total_vaccinations) ) OVER (ORDER BY substr(date, 7, 4),
substr(date, 4, 2) ) ) / NULLIF(LAG(SUM(total_vaccinations) ) OVER (ORDER BY substr(date, 7, 4),
substr(date, 4, 2) ), 0) AS GR
FROM Vaccination_by_manu
GROUP BY Year,
Month
)
AS GlobalGR
GROUP BY Year,
Month
)
AS ga ON g.Year = ga.Year AND
g.Month = ga.Month
WHERE g.GR > ga.avg_global_GR
ORDER BY g.Year,
g.Month,
g.GR DESC;
```

Snapshot:-



Country Name	Month	Year	cumulative_doses	GR	avg_global_GR	Difference of GR to Global Average
Italy	01	2021	13450	1221	55.0	1166.0
France	01	2021	280896	455	55.0	400.0
Argentina	01	2021	6732154	63	55.0	8.0
Czechia	01	2021	2083987	61	55.0	6.0
Germany	01	2021	654	58	55.0	3.0
Germany	02	2021	17445835	26674	5.0	26669.0
France	02	2021	30778274	108	5.0	103.0
Belgium	02	2021	2107221	73	5.0	68.0
Ireland	02	2021	63	8	5.0	3.0
Croatia	03	2021	282552	70637	1.0	70636.0
Hong Kong	03	2021	2547688	60	1.0	59.0
Italy	03	2021	242	4	1.0	3.0
Argentina	03	2021	86581854	3	1.0	2.0
Portugal	03	2021	1608	2	1.0	1.0
Latvia	04	2021	289	40	0.0	40.0
Austria	04	2021	1117705	3	0.0	3.0
Belgium	04	2021	8048175	3	0.0	3.0
United States	04	2021	15254452	3	0.0	3.0
Uruguay	04	2021	8354666	2	0.0	2.0
Argentina	04	2021	191337915	1	0.0	1.0
Czechia	04	2021	13037078	1	0.0	1.0
Portugal	05	2021	4436	15	0.0	15.0
Germany	05	2021	53857893	2	0.0	2.0
Hong Kong	05	2021	10815653	2	0.0	2.0
Canada	05	2021	17824050	1	0.0	1.0
Czechia	05	2021	26610007	1	0.0	1.0
Italy	06	2021	34413027	142201	0.0	142201.0
Latvia	06	2021	607391	2100	0.0	2100.0

Fig 3:- Screenshot of the task 2 executing in SQLite web

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Visualizations:-

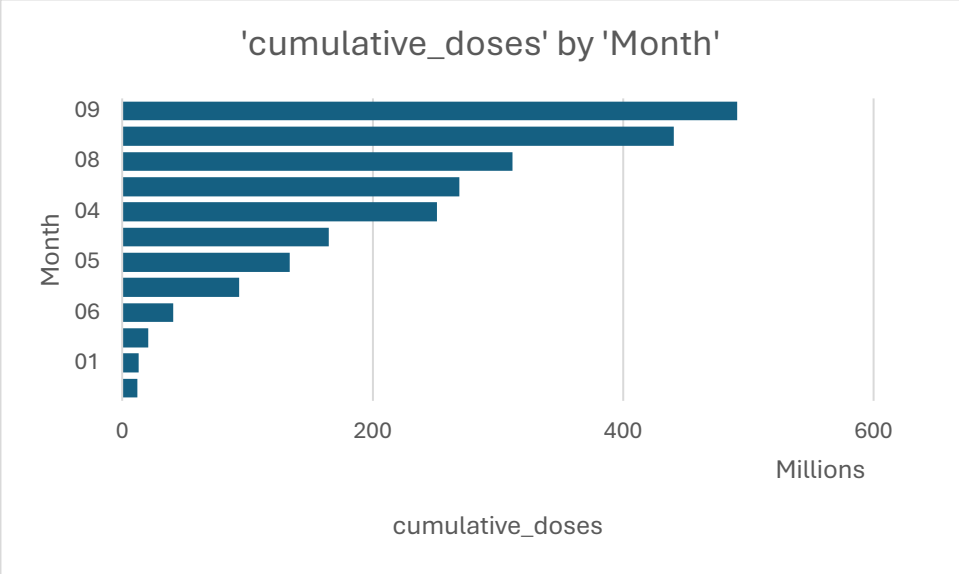


Fig 4:- Cumulative doses monthly

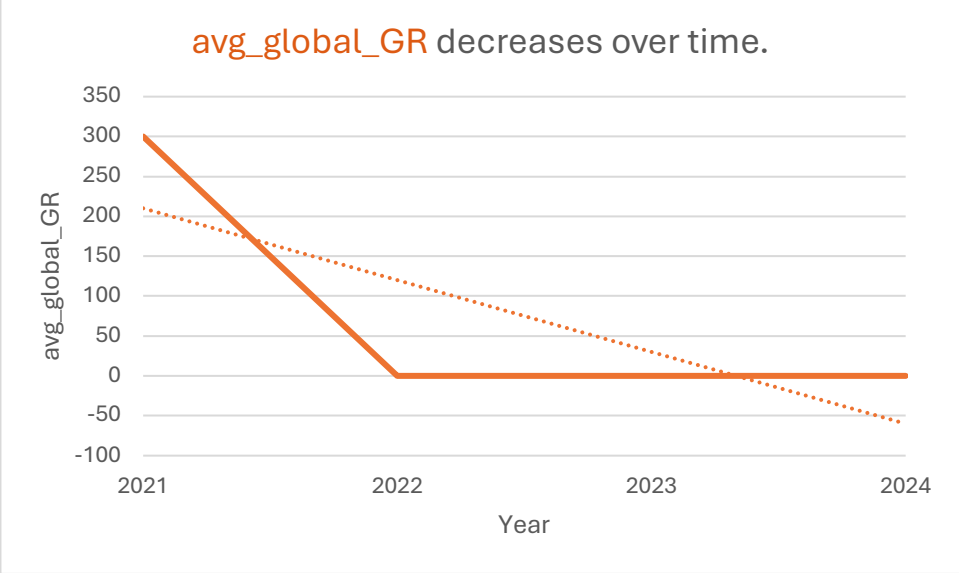


Fig 5:- Global Vaccination rate over the year 2021 to 2024

Task D.3: -

Query:-

```
SELECT "Vaccine Type",
"Country",
"Percentage of vaccine type"
FROM (
SELECT vbm.vaccine AS [Vaccine Type],
vbm.country_name AS Country,
(vbm.total_vaccinations * 1.0 / ct.total_vaccinations_country) * 100 AS [Percentage of vaccine type],
```

```
ROW_NUMBER() OVER (PARTITION BY vbm.country_name ORDER BY (vbm.total_vaccinations *
1.0 / ct.total_vaccinations_country) DESC) AS rank
FROM Vaccination_by_manu vbm
JOIN
(
SELECT country_name,
SUM(total_vaccinations) AS total_vaccinations_country
FROM Vaccination_by_manu
GROUP BY country_name
)
ct ON vbm.country_name = ct.country_name
)
AS VaccineShare
WHERE rank <= 5
ORDER BY "Percentage of vaccine type" DESC
LIMIT 5;
```

Snapshot:-

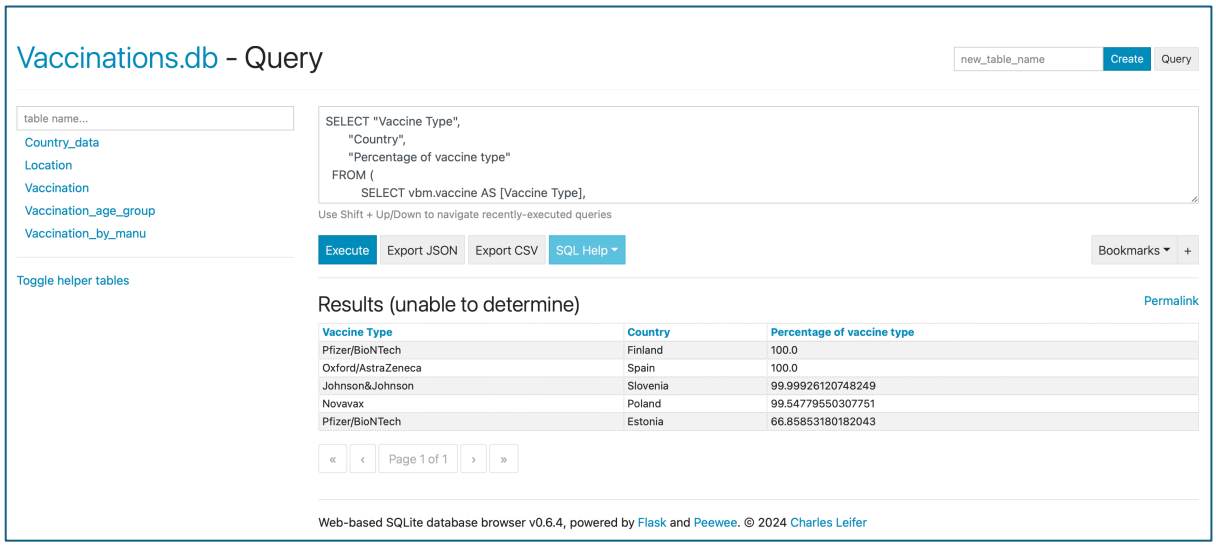


Fig 6: - Screenshot showing task 3 is done in SQLite web

Visualization:-

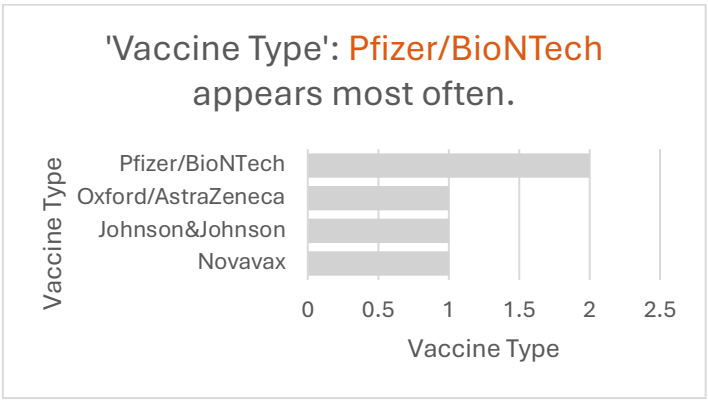


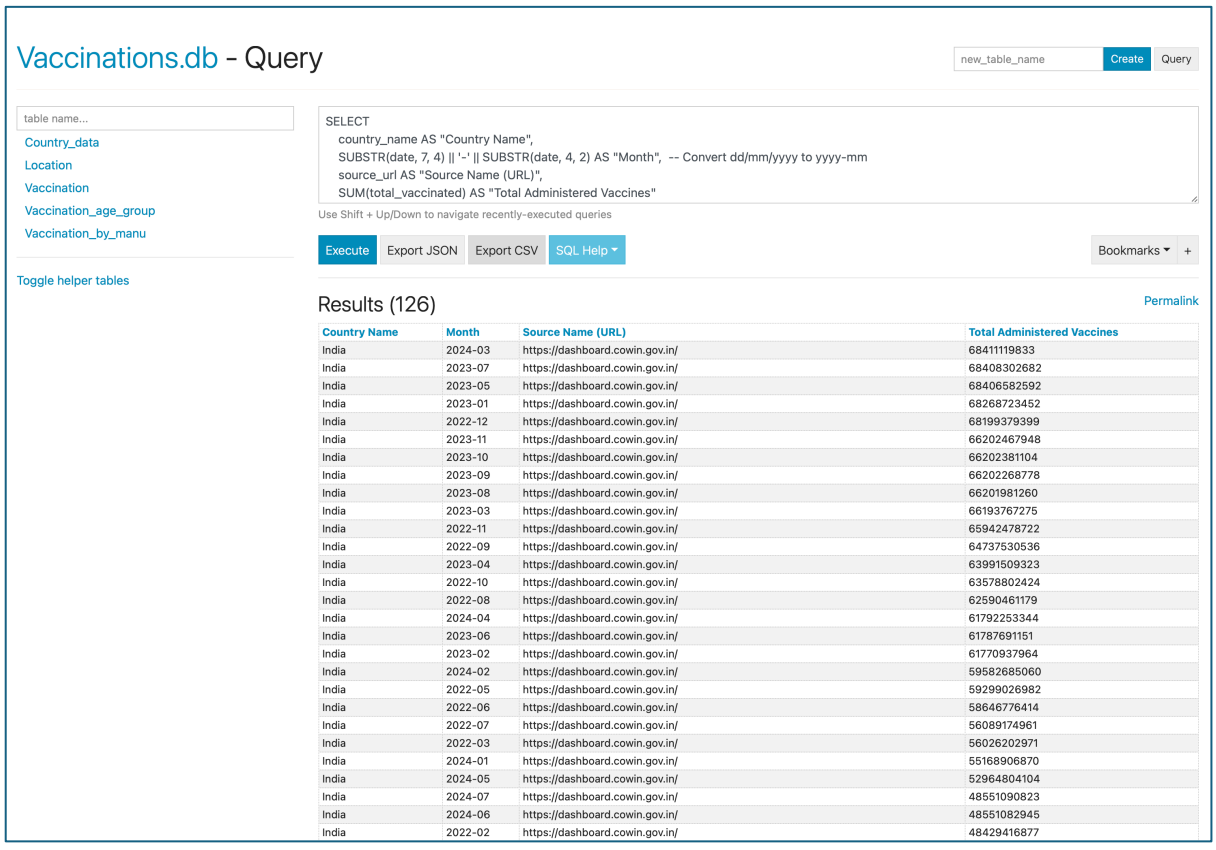
Fig 7: - Type of vaccine in top 5 vaccination country

Task D.4: -

Query:

```
SELECT
country_name AS "Country Name",
SUBSTR(date, 7, 4) || '-' || SUBSTR(date, 4, 2) AS "Month", -- Convert dd/mm/yyyy to yyyy-mm
source_url AS "Source Name (URL)",
SUM(total_vaccinated) AS "Total Administered Vaccines"
FROM
Country_data
GROUP BY
country_name,
SUBSTR(date, 7, 4) || '-' || SUBSTR(date, 4, 2), -- Group by formatted date
source_url
ORDER BY
"Total Administered Vaccines" DESC;
```

Snapshot:-



Country Name	Month	Source Name (URL)	Total Administered Vaccines
India	2024-03	https://dashboard.cowin.gov.in/	68411119833
India	2023-07	https://dashboard.cowin.gov.in/	68408302682
India	2023-05	https://dashboard.cowin.gov.in/	68406582592
India	2023-01	https://dashboard.cowin.gov.in/	68268723452
India	2022-12	https://dashboard.cowin.gov.in/	68199379399
India	2023-11	https://dashboard.cowin.gov.in/	66202467948
India	2023-10	https://dashboard.cowin.gov.in/	66202381104
India	2023-09	https://dashboard.cowin.gov.in/	66202268778
India	2023-08	https://dashboard.cowin.gov.in/	66201981260
India	2023-03	https://dashboard.cowin.gov.in/	66193767275
India	2022-11	https://dashboard.cowin.gov.in/	65942478722
India	2022-09	https://dashboard.cowin.gov.in/	64737530536
India	2023-04	https://dashboard.cowin.gov.in/	63991509323
India	2022-10	https://dashboard.cowin.gov.in/	63578802424
India	2022-08	https://dashboard.cowin.gov.in/	62590461179
India	2024-04	https://dashboard.cowin.gov.in/	61792253344
India	2023-06	https://dashboard.cowin.gov.in/	61787691151
India	2023-02	https://dashboard.cowin.gov.in/	61770937964
India	2024-02	https://dashboard.cowin.gov.in/	59582685060
India	2022-05	https://dashboard.cowin.gov.in/	59299026982
India	2022-06	https://dashboard.cowin.gov.in/	58646776414
India	2022-07	https://dashboard.cowin.gov.in/	56089174961
India	2022-03	https://dashboard.cowin.gov.in/	56026202971
India	2024-01	https://dashboard.cowin.gov.in/	55168906870
India	2024-05	https://dashboard.cowin.gov.in/	52964804104
India	2024-07	https://dashboard.cowin.gov.in/	48551090823
India	2024-06	https://dashboard.cowin.gov.in/	48551082945
India	2022-02	https://dashboard.cowin.gov.in/	48429416877

Fig 8: - Screenshot of executing the task 4 in SQLite web

Visualization:-

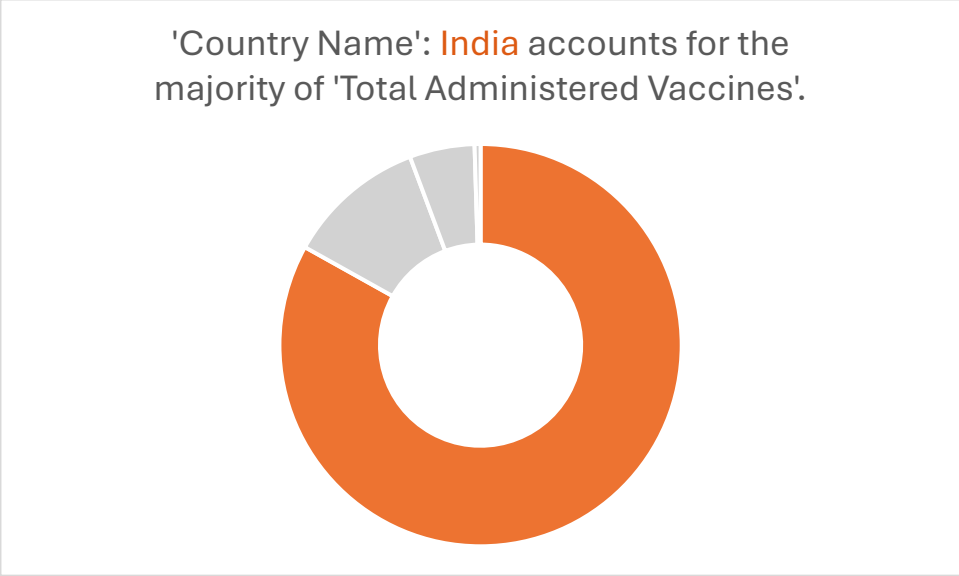


Fig 9: - Vaccination administrated by India, China, The United States and Ireland

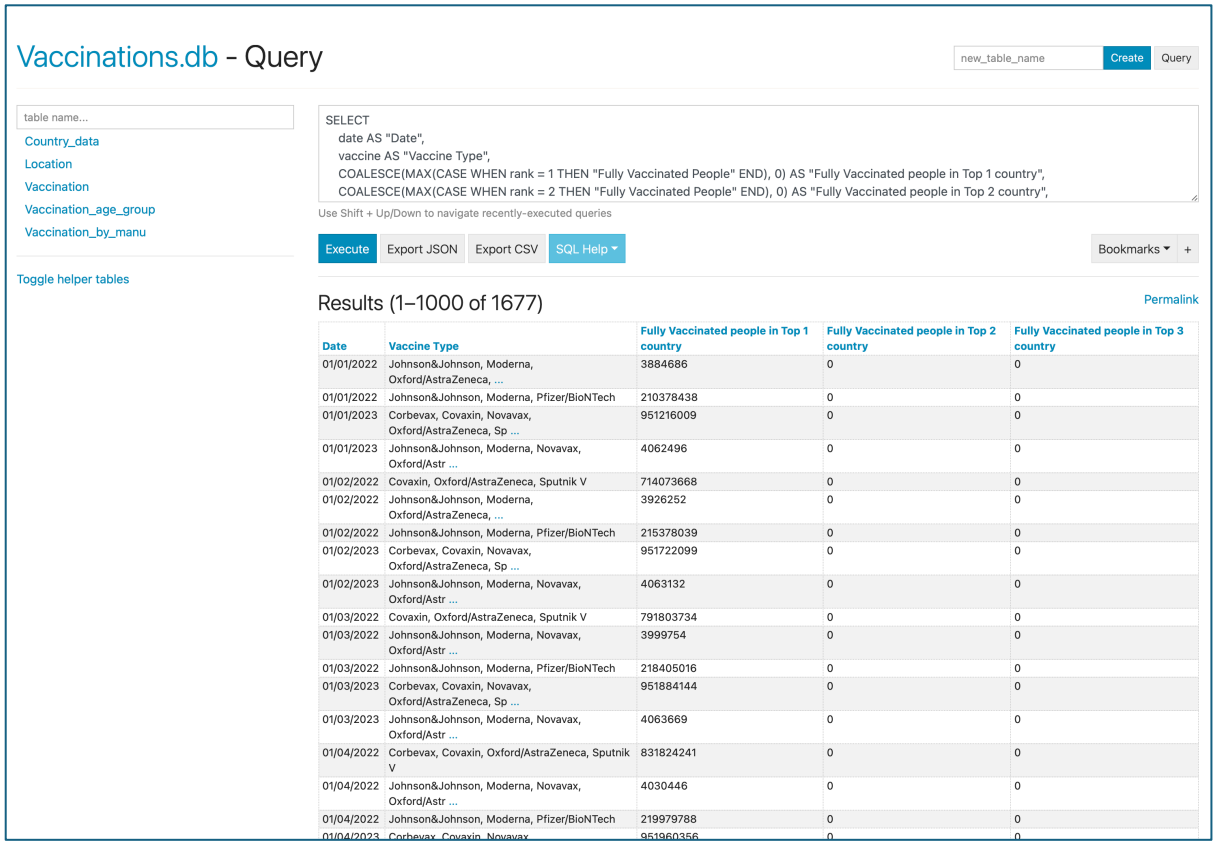
Task D.5:-

Query:-

```
SELECT
date AS "Date",
vaccine AS "Vaccine Type",
COALESCE(MAX(CASE WHEN rank = 1 THEN "Fully Vaccinated People" END), 0) AS "Fully
Vaccinated people in Top 1 country",
COALESCE(MAX(CASE WHEN rank = 2 THEN "Fully Vaccinated People" END), 0) AS "Fully
Vaccinated people in Top 2 country",
COALESCE(MAX(CASE WHEN rank = 3 THEN "Fully Vaccinated People" END), 0) AS "Fully
Vaccinated people in Top 3 country"
FROM (
SELECT
date,
vaccine,
country_name AS "Country",
people_fully_vaccinated AS "Fully Vaccinated People",
ROW_NUMBER() OVER (PARTITION BY date, vaccine ORDER BY people_fully_vaccinated DESC)
AS rank
FROM
Country_data
WHERE
SUBSTR(date, 7, 4) IN ('2022', '2023')
) AS RankedCountries
WHERE
rank <= 3
GROUP BY
date,
vaccine
ORDER BY
```

date,
vaccine;

Snapshot:-



Date	Vaccine Type	Fully Vaccinated people in Top 1 country	Fully Vaccinated people in Top 2 country	Fully Vaccinated people in Top 3 country
01/01/2022	Johnson&Johnson, Moderna, Oxford/AstraZeneca, ...	3884686	0	0
01/01/2022	Johnson&Johnson, Moderna, Pfizer/BioNTech	210378438	0	0
01/01/2023	Corbevax, Covaxin, Novavax, Oxford/AstraZeneca, Sp ...	951216009	0	0
01/01/2023	Johnson&Johnson, Moderna, Novavax, Oxford/Astr ...	4062496	0	0
01/02/2022	Covaxin, Oxford/AstraZeneca, Sputnik V	714073668	0	0
01/02/2022	Johnson&Johnson, Moderna, Oxford/AstraZeneca, ...	3926252	0	0
01/02/2022	Johnson&Johnson, Moderna, Pfizer/BioNTech	215378039	0	0
01/02/2023	Corbevax, Covaxin, Novavax, Oxford/AstraZeneca, Sp ...	951722099	0	0
01/02/2023	Johnson&Johnson, Moderna, Novavax, Oxford/Astr ...	4063132	0	0
01/03/2022	Covaxin, Oxford/AstraZeneca, Sputnik V	791803734	0	0
01/03/2022	Johnson&Johnson, Moderna, Novavax, Oxford/Astr ...	3999754	0	0
01/03/2022	Johnson&Johnson, Moderna, Pfizer/BioNTech	218405016	0	0
01/03/2023	Corbevax, Covaxin, Novavax, Oxford/AstraZeneca, Sp ...	951884144	0	0
01/03/2023	Johnson&Johnson, Moderna, Novavax, Oxford/Astr ...	4063669	0	0
01/04/2022	Corbevax, Covaxin, Oxford/AstraZeneca, Sputnik V	831824241	0	0
01/04/2022	Johnson&Johnson, Moderna, Novavax, Oxford/Astr ...	4030446	0	0
01/04/2022	Johnson&Johnson, Moderna, Pfizer/BioNTech	219979788	0	0
01/04/2023	Corbevax, Covaxin, Novavax	951960356	0	0

Fig 10: - Screenshot of executing the task 4 in SQLite web

Visualization:

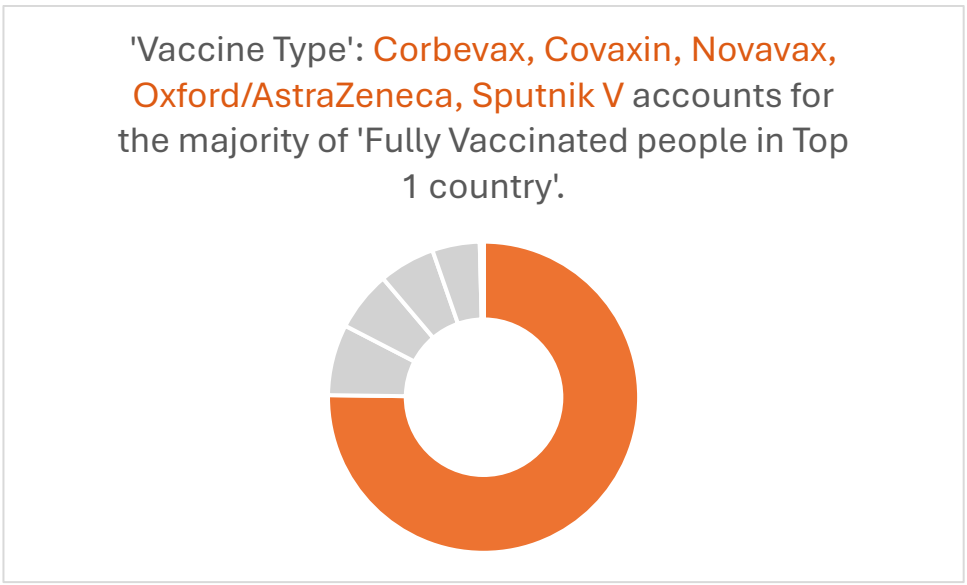


Fig 11: - Demonstrating the different types of vaccination used around the globe

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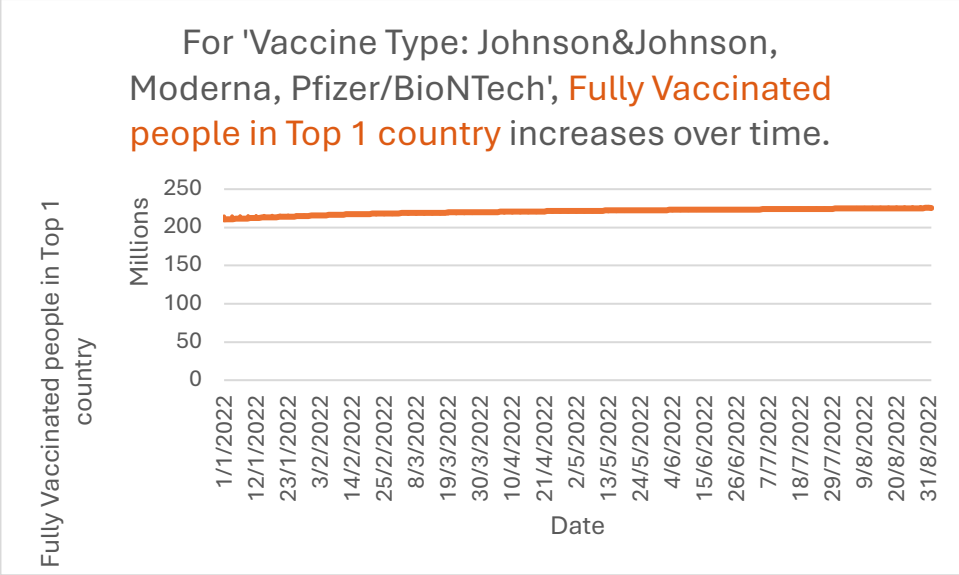

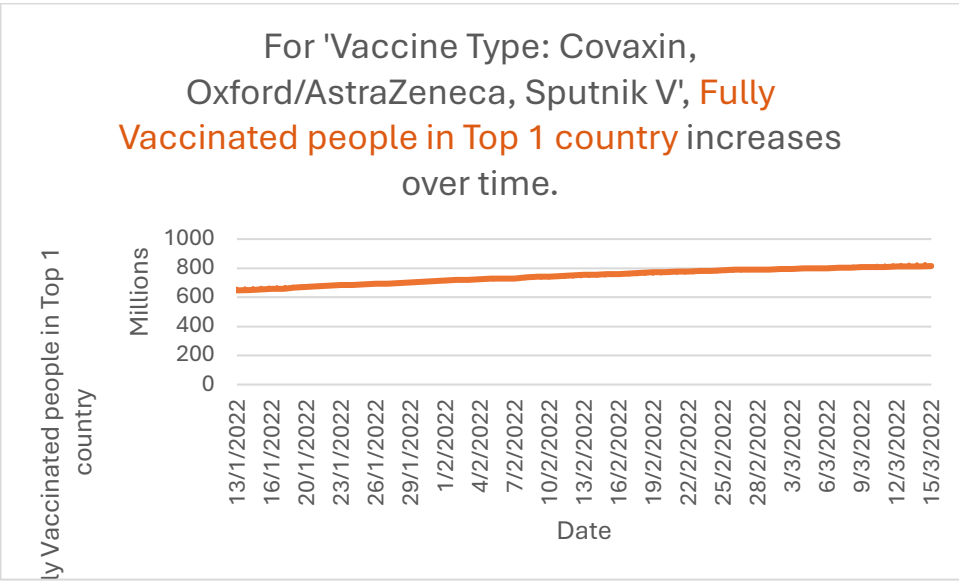

Fig 12:- Demonstrating the Vaccination type used in the different dates