1-Find the top 3 airlines that serve the most routes in each country.

Consider both (source and destination)

Query:

```
. .
WITH airline_route_counts AS (
       r.airline_id,
    FROM db_SCHEMA1.fact_routes r
    JOIN db_SCHEMA1.dim_airports a ON r.source_airport_id = a.airport_id
    UNION ALL
        r.airline_id,
            WHEN r.destination_airport_id != r.source_airport_id THEN a.country
            ELSE NULL
       COUNT(*) AS route_count
    JOIN db_SCHEMA1.dim_airports a ON r.destination_airport_id = a.airport_id
    GROUP BY r.airline_id, a.country, r.destination_airport_id, r.source_airport_id
    airline_name,
       route_count,
       ROW_NUMBER() OVER (PARTITION BY ar.country ORDER BY route_count DESC) AS rank
    join db_SCHEMA1.dim_airlines as da
) ranked_routes
```

		country text	airline_name text	route_count bigint
ı	1	Afghanistan	Ariana Afghan Airlines	11
	2	Afghanistan	Safi Airlines	9
	3	Afghanistan	Hankook Airline	6
	4	Albania	Alitalia	9
	5	Albania	Blue Panorama Airlines	7
ı	6	Albania	Air One	6
	7	Algeria	Air Algerie	154
	8	Algeria	Aigle Azur	25
	9	Algeria	Iberia Airlines	5

2-Identify the airports with the most codeshare flights along with the number of codeshare routes.

Query:

```
SELECT

a.name AS airport_name,
a.city,
a.country,
COUNT(r.flight_number) AS codeshare_routes
FROM db_SCHEMA1.fact_routes r
JOIN db_SCHEMA1.dim_airports a ON r.source_airport_id = a.airport_id
WHERE r.codeshare = TRUE
GROUP BY a.name, a.city, a.country
ORDER BY codeshare_routes DESC;
```

results

	airport_name text	city text	country text	codeshare_routes bigint
1	Hartsfield Jackson Atlanta International Airport	Atlanta	United States	635
2	Chicago O'Hare International Airport	Chicago	United States	283
3	London Heathrow Airport	London	United Kingdom	217
4	Los Angeles International Airport	Los Angeles	United States	212
5	Frankfurt am Main Airport	Frankfurt	Germany	179
6	Vienna International Airport	Vienna	Austria	165
7	Charles de Gaulle International Airport	Paris	France	162
8	Munich Airport	Munich	Germany	155
9	Amsterdam Airport Schiphol	Amsterdam	Netherlands	150

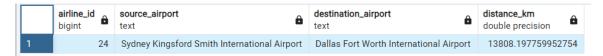
3-Calculate the distance between airports for direct flights (zero stops) and find the longest flight, provide the airline, source, and destination airport details.

Query

```
SELECT
r.airline_id,
sa.name AS source_airport,
da.name AS destination_airport,
r.distance_km

FROM db_SCHEMA1.fact_routes r
JOIN db_SCHEMA1.dim_airports sa ON r.source_airport_id = sa.airport_id
JOIN db_SCHEMA1.dim_airports da ON r.destination_airport_id = da.airport_id
WHERE r.stopovers = 0
ORDER BY r.distance_km DESC
LIMIT 1;
```

result



4-Find which airport hosts the most unique airlines based on the routes operated, along with the number of different airlines operating there

Query

```
SELECT

a.name AS airport_name,
a.city,
COUNT(DISTINCT r.airline_id) AS unique_airlines

FROM db_SCHEMA1.fact_routes r
JOIN db_SCHEMA1.dim_airports a ON r.source_airport_id = a.airport_id

GROUP BY a.name, a.city

ORDER BY unique_airlines DESC
LIMIT 1;
```

	airport_name text	city text	unique_airlines bigint
1	Charles de Gaulle International Airport	Paris	111

5-Find which airline covers the widest range of geographic latitudes or longitudes between the airports it serves.

Query

```
SELECT al.name, MAX(r.distance_km) AS max_distance
FROM db_SCHEMA1.fact_routes r
JOIN db_SCHEMA1.dim_airlines al ON r.airline_id = al.airline_id
GROUP BY al.name
ORDER BY max_distance DESC
LIMIT 1;
```

	name text	ì	max_distance double precision
1	Qantas		13808.197759952754

6-Identify which cities serve multiple types of transport (e.g., air terminal, train station, or port

Query

```
SELECT
city,
COUNT(DISTINCT airport_type) AS transport_types_count
FROM db_SCHEMA1.dim_airports
GROUP BY city
HAVING COUNT(DISTINCT airport_type) > 1
ORDER BY transport_types_count DESC;
```

	city text	transport_types_count bigint
1	Hong Kong	5
2	Stockholm	5
3	Auckland	5
4	Prague	4
5	Amsterdam	4
6	Moscow	4
7	St. Petersburg	4
8	Tampa	4
9	Boston	4

Which airports have the highest number of airlines operating and the highest number of routes, indicating potential congestion.

Query

```
WITH airport_airline_counts AS (
    SELECT
        r.source_airport_id AS airport_id,
        COUNT(DISTINCT r.airline_id) AS airline_count
    FROM db_SCHEMA1.fact_routes r
    GROUP BY r.source_airport_id
airport_route_counts AS (
        r.source_airport_id AS airport_id,
    FROM db_SCHEMA1.fact_routes r
    GROUP BY r.source_airport_id
SELECT
    a.airport_id,
    a.name AS airport_name,
    COALESCE(aa.airline_count, 0) AS airline_count,
FROM db_SCHEMA1.dim_airports a
LEFT JOIN airport_airline_counts aa ON a.airport_id = aa.airport_id
LEFT JOIN airport_route_counts ar ON a.airport_id = ar.airport_id
```

	airport_id [PK] integer	airport_name text	city text	country text	airline_count bigint	route_count bigint
1	1382	Charles de Gaulle International Airport	Paris	France	111	541
2	340	Frankfurt am Main Airport	Frankfurt	Germany	104	673
3	3885	Suvarnabhumi Airport	Bangkok	Thailand	103	339
4	1555	Leonardo da Vinci-Fiumicino Airport	Rome	Italy	96	348
5	507	London Heathrow Airport	London	United Kingdom	90	547
6	3316	Singapore Changi Airport	Singapore	Singapore	87	496
7	3077	Hong Kong International Airport	Hong Kong	Hong Kong	87	365
8	2188	Dubai International Airport	Dubai	United Arab Emirates	85	355
9	3364	Beijing Capital International Airport	Beijing	China	83	533