**SQL QUERIES : (Medium level):**

**Vehicle-Based**

1. What are the top 10 vehicles involved in drug-related stops?

SELECT vehicle\_number, COUNT(\*) AS drug\_related\_count

FROM traffic\_stops

WHERE drugs\_related\_stop = TRUE

GROUP BY vehicle\_number

ORDER BY drug\_related\_count DESC

LIMIT 10;

2. Which vehicles were most frequently searched?

SELECT vehicle\_number, COUNT(\*) AS search\_count

FROM traffic\_stops

WHERE search\_conducted = TRUE

GROUP BY vehicle\_number

ORDER BY search\_count DESC;

**Demographic-Based**

1. Which driver age group had the highest arrest rate?

SELECT

CASE

WHEN driver\_age BETWEEN 10 AND 20 THEN '10-20'

WHEN driver\_age BETWEEN 21 AND 30 THEN '21-30'

WHEN driver\_age BETWEEN 31 AND 40 THEN '31-40'

WHEN driver\_age BETWEEN 41 AND 50 THEN '41-50'

WHEN driver\_age BETWEEN 51 AND 60 THEN '51-60'

WHEN driver\_age BETWEEN 61 AND 70 THEN '61-70'

ELSE '71+'

END AS age\_group,

COUNT(\*) AS arrest\_count

FROM traffic\_stops

WHERE is\_arrested = TRUE

GROUP BY age\_group

ORDER BY arrest\_count DESC

LIMIT 1;

1. What is the gender distribution of drivers stopped in each country?

SELECT country\_name, driver\_gender, COUNT(\*) AS stop\_count

FROM traffic\_stops

GROUP BY country\_name, driver\_gender

ORDER BY country\_name, stop\_count DESC;

1. Which race and gender combination has the highest search rate?

SELECT driver\_race, driver\_gender,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) AS search\_count,

(SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS search\_rate

FROM traffic\_stops

GROUP BY driver\_race, driver\_gender

ORDER BY search\_rate DESC

LIMIT 1;

ANSWER = ASIAN, FEMALE

**Time & Duration Based**

1. What time of day sees the most traffic stops?

SELECT

SPLIT\_PART(stop\_time, ':', 1)::INT AS stop\_hour,

COUNT(\*) AS stop\_count

FROM traffic\_stops

GROUP BY stop\_hour

ORDER BY stop\_count DESC

LIMIT 1;

ANSWER; 10 AM,

1. What is the average stop duration for different violations?

SELECT

violation,

AVG(CASE

WHEN stop\_duration = '0-15 Min' THEN 7.5

WHEN stop\_duration = '16-30 Min' THEN 23

WHEN stop\_duration = '30+ Min' THEN 45

END) AS avg\_stop\_duration

FROM traffic\_stops

GROUP BY violation

ORDER BY avg\_stop\_duration DESC;

ANSWER

"Other" 25.7147567075943611

"Seatbelt" 25.1737141539171215

"Speeding" 25.0872623574144487

"DUI" 25.0530019120458891

"Signal" 25.0067876754118365

1. Are stops during the night more likely to lead to arrests?

SELECT

CASE

WHEN SPLIT\_PART(stop\_time, ':', 1)::INT BETWEEN 0 AND 5 THEN 'Midnight - 5 AM'

WHEN SPLIT\_PART(stop\_time, ':', 1)::INT BETWEEN 6 AND 11 THEN '6 AM - 11 AM'

WHEN SPLIT\_PART(stop\_time, ':', 1)::INT BETWEEN 12 AND 17 THEN '12 PM - 5 PM'

WHEN SPLIT\_PART(stop\_time, ':', 1)::INT BETWEEN 18 AND 23 THEN '6 PM - 11 PM'

END AS time\_period,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS arrests,

(SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS arrest\_rate

FROM traffic\_stops

GROUP BY time\_period

ORDER BY arrest\_rate DESC;

ANSWER : Its 50/50 Chance Only

**Violation-Based**

1. Which violations are most associated with searches or arrests?

SEARCH\_RATE

SELECT violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) AS search\_count,

(SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS search\_rate

FROM traffic\_stops

GROUP BY violation

ORDER BY search\_rate DESC;

ARREST\_RATE

SELECT violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS arrest\_count,

(SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS arrest\_rate

FROM traffic\_stops

GROUP BY violation

ORDER BY arrest\_rate DESC;

ANSWER ; DUI WITH ARREST

1. Which violations are most common among younger drivers (<25)?

SELECT violation, COUNT(\*) AS violation\_count

FROM traffic\_stops

WHERE driver\_age < 25

GROUP BY violation

ORDER BY violation\_count DESC;

ANSWER: SPEEDING

1. Is there a violation that rarely results in search or arrest?

SEARCH\_RATE

SELECT violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) AS search\_count,

(SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS search\_rate

FROM traffic\_stops

GROUP BY violation

ORDER BY search\_rate ASC

LIMIT 1;

ARREST\_RATE

SELECT violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS arrest\_count,

(SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS arrest\_rate

FROM traffic\_stops

GROUP BY violation

ORDER BY arrest\_rate ASC

LIMIT 1;

ANSWER : OTHERS in Arrest

**Location-Based**

1. Which countries report the highest rate of drug-related stops?

SELECT country\_name,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN drugs\_related\_stop = TRUE THEN 1 ELSE 0 END) AS drug\_related\_count,

(SUM(CASE WHEN drugs\_related\_stop = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS drug\_related\_rate

FROM traffic\_stops

GROUP BY country\_name

ORDER BY drug\_related\_rate DESC;

ANSWER : 1.USA, 2.CANADA, 3.INDIA

1. What is the arrest rate by country and violation?

SELECT

country\_name,

violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS arrest\_count,

(SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)) AS arrest\_rate

FROM traffic\_stops

GROUP BY country\_name, violation

ORDER BY arrest\_rate DESC;

15.Which country has the most stops with search conducted?

SELECT

country\_name,

COUNT(\*) AS search\_count

FROM traffic\_stops

WHERE search\_conducted = TRUE

GROUP BY country\_name

ORDER BY search\_count DESC

LIMIT 1;

ANSWER : CANADA

**(Complex):**

1. Yearly Breakdown of Stops and Arrests by Country (Using Subquery and Window Functions)

WITH yearly\_stops AS (

SELECT

country\_name,

EXTRACT(YEAR FROM stop\_date::DATE) AS stop\_year,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS total\_arrests

FROM traffic\_stops

GROUP BY country\_name, stop\_year

)

SELECT

country\_name,

stop\_year,

total\_stops,

total\_arrests,

ROUND((total\_arrests \* 100.0 / total\_stops), 2) AS arrest\_rate, -- Percentage of arrests

RANK() OVER (PARTITION BY stop\_year ORDER BY total\_stops DESC) AS stop\_rank -- Rank by total stops per year

FROM yearly\_stops

ORDER BY stop\_year DESC, stop\_rank;

1. Driver Violation Trends Based on Age and Race (Join with Subquery)

WITH age\_race\_stats AS (

SELECT

driver\_age,

driver\_race,

violation,

COUNT(\*) AS violation\_count

FROM traffic\_stops

GROUP BY driver\_age, driver\_race, violation

)

SELECT

driver\_age,

driver\_race,

violation,

violation\_count,

RANK() OVER (PARTITION BY driver\_race ORDER BY violation\_count DESC) AS race\_violation\_rank,

RANK() OVER (PARTITION BY driver\_age ORDER BY violation\_count DESC) AS age\_violation\_rank

FROM age\_race\_stats

ORDER BY race\_violation\_rank, age\_violation\_rank;

1. Time Period Analysis of Stops (Joining with Date Functions) , Number of Stops by Year,Month, Hour of the Day

Number of Stops by Year

SELECT

EXTRACT(YEAR FROM stop\_date::DATE) AS stop\_year,

COUNT(\*) AS total\_stops

FROM traffic\_stops

GROUP BY stop\_year

ORDER BY stop\_year DESC;

Stops by Month

SELECT

EXTRACT(YEAR FROM stop\_date::DATE) AS stop\_year,

EXTRACT(MONTH FROM stop\_date::DATE) AS stop\_month,

COUNT(\*) AS total\_stops

FROM traffic\_stops

GROUP BY stop\_year, stop\_month

ORDER BY stop\_year DESC, stop\_month DESC;

Stops by Hour of the Day

SELECT

SPLIT\_PART(stop\_time, ':', 1)::INT AS stop\_hour,

COUNT(\*) AS total\_stops

FROM traffic\_stops

GROUP BY stop\_hour

ORDER BY total\_stops DESC;

1. Violations with High Search and Arrest Rates (Window Function)

WITH violation\_stats AS (

SELECT

violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) AS search\_count,

ROUND((SUM(CASE WHEN search\_conducted = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)), 2) AS search\_rate,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS arrest\_count,

ROUND((SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)), 2) AS arrest\_rate

FROM traffic\_stops

GROUP BY violation

)

SELECT

violation,

total\_stops,

search\_count,

search\_rate,

arrest\_count,

arrest\_rate,

RANK() OVER (ORDER BY search\_rate DESC) AS search\_rank,

RANK() OVER (ORDER BY arrest\_rate DESC) AS arrest\_rank

FROM violation\_stats

ORDER BY search\_rank, arrest\_rank;

1. Driver Demographics by Country (Age, Gender, and Race)

SELECT

country\_name,

driver\_gender,

driver\_race,

ROUND(AVG(driver\_age), 2) AS avg\_age,

COUNT(\*) AS total\_stops

FROM traffic\_stops

GROUP BY country\_name, driver\_gender, driver\_race

ORDER BY country\_name, total\_stops DESC;

6.Top 5 Violations with Highest Arrest Rates

SELECT

violation,

COUNT(\*) AS total\_stops,

SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) AS arrest\_count,

ROUND((SUM(CASE WHEN is\_arrested = TRUE THEN 1 ELSE 0 END) \* 100.0 / COUNT(\*)), 2) AS arrest\_rate

FROM traffic\_stops

GROUP BY violation

ORDER BY arrest\_rate DESC

LIMIT 5;