**USING POSTGRESQL**

In this we first open the ( pgadmin ) in postgresql and we see the database ( right click on it having option of the create data base just click on it their is option having (databse name (write (name like eg music\_store) after this click on ok then the data base create after that go to databse click on it music\_store (right click (restore option click on it) and a dialogue box open when is option having file name select the file name from your computer and click ok

**Question Set 1 - Easy \*/**

**Q1:** Who is the senior most employee based on job title?

----- table used in this ( " employee " ) table -- ( select \* from employee )

select \* from employee

order by levels desc -- we used levels (desc) in this for senior most

limit 1 -- it show only one output in the table

------------ **OR** --------------

SELECT title, last\_name, first\_name

FROM employee

ORDER BY levels DESC

LIMIT 1

**Q2**: Which countries have the most Invoices?

----- in this we use ( " invoice " ) table ---

select \* from invoices

---- in the question asked country having ( " most invoice " ) means it need the ( " count " ) of the invoice

select count(\*), billing\_country

from invoice

group by billing\_country -- group by means create the group of the country and give in the output

order by count desc

------ OR ---------

SELECT COUNT(\*) AS c, billing\_country

FROM invoice

GROUP BY billing\_country

ORDER BY c DESC

**Q3:** What are top 3 values of total invoice?

----- in this we use ( " invoice " ) table ---

select \* from invoice

---------------------------------------------------------

select total from invoice --- total is our column name, on bases of that we sort our data in desc order

order by total desc

limit 3

--------- OR -------------

SELECT total

FROM invoice

ORDER BY total DESC

**Q4:** Which city has the best customers? We would like to throw a promotional Music Festival in the city we made the most money.

Write a query that returns one city that has the highest sum of invoice totals.

Return both the city name & sum of all invoice totals

--- in this we use ( " invoice " ) table –

select \* from invoice

------------------------------------------------------------------

select sum(total) as invoice\_total, billing\_city from invoice

group by billing\_city --- in this we do group by billing\_city because we need the data in city level

order by invoice\_total desc --- in order by we give order to the column in this we apply desc

-------- **OR** ----------

SELECT billing\_city,SUM(total) AS InvoiceTotal

FROM invoice

GROUP BY billing\_city

ORDER BY InvoiceTotal DESC

LIMIT 1;

**Q5:** Who is the best customer? The customer who has spent the most money will be declared the best customer.

Write a query that returns the person who has spent the most money.

---- in this we use two table ( " customer and invoice " ) table -----

select \* from cusotmer

select \* from invoice

-------------------------------------------------------------------------------------------

select customer.customer\_id, customer.first\_name, customer.last\_name, sum(invoice.total) as total

from customer

join invoice on customer.customer\_id = invoice.customer\_id

group by customer.customer\_id

order by total desc

limit 1

-------- **OR** --------

SELECT customer.customer\_id, first\_name, last\_name, SUM(total) AS total\_spending

FROM customer

JOIN invoice ON customer.customer\_id = invoice.customer\_id

GROUP BY customer.customer\_id

ORDER BY total\_spending DESC

LIMIT 1;

**Question Set 2 - Moderate**

**Q1:** Write query to return the email, first name, last name, & Genre of all Rock Music listeners.

Return your list ordered alphabetically by email starting with A.

---- ( in this we used the table " cusotmer " / " Invoice " / " InvoiceLine" / " Track" / " Genere" table )

select \* from customer

select \* from Invoice

select \* from InvoiceLine

select \* from Track

select \* from Genere

---------------------------------------------------------------------

SELECT DISTINCT email, first\_name, last\_name

FROM customer

JOIN invoice ON customer.customer\_id = invoice.customer\_id

JOIN invoiceline ON invoice.invoice\_id = invoiceline.invoice\_id

WHERE track\_id IN( ----- we apply inner query ( in )

SELECT track\_id FROM track

JOIN genre ON track.genre\_id = genre.genre\_id

WHERE genre.name LIKE 'Rock'

)

ORDER BY email;

-------------- **Method 2** ----------------

SELECT DISTINCT email AS Email,first\_name AS FirstName, last\_name AS LastName, genre.name AS Name

FROM customer

JOIN invoice ON invoice.customer\_id = customer.customer\_id

JOIN invoiceline ON invoiceline.invoice\_id = invoice.invoice\_id

JOIN track ON track.track\_id = invoiceline.track\_id

JOIN genre ON genre.genre\_id = track.genre\_id

WHERE genre.name LIKE 'Rock'

ORDER BY email;

**Q2:** Let's invite the artists who have written the most rock music in our dataset.

Write a query that returns the Artist name and total track count of the top 10 rock bands.

----- We Use Table ( " Artist " / " Album " / " Track " ) table ------

select \* from Artist

select \* from Album

select \* from Track

----------------------------------------------------------------------------------------------------

SELECT artist.artist\_id, artist.name,COUNT(artist.artist\_id) AS number\_of\_songs

FROM track

JOIN album ON album.album\_id = track.album\_id

JOIN artist ON artist.artist\_id = album.artist\_id

JOIN genre ON genre.genre\_id = track.genre\_id

WHERE genre.name LIKE 'Rock'

GROUP BY artist.artist\_id

ORDER BY number\_of\_songs DESC

LIMIT 10;

**Q3:** Return all the track names that have a song length longer than the average song length.

Return the Name and Milliseconds for each track. Order by the song length with the longest songs listed first.

---- we use table ( " Track " ) ----

select \* from Track

-------------------------------------------------------------------------

SELECT name,milliseconds

FROM track

WHERE milliseconds > (

SELECT AVG(milliseconds) AS avg\_track\_length

FROM track )

ORDER BY milliseconds DESC;

**Question Set 3 - Advance**

**Q1:** Find how much amount spent by each customer on artists? Write a query to return customer name, artist name and total spent

Steps to Solve: First, find which artist has earned the most according to the InvoiceLines. Now use this artist to find

which customer spent the most on this artist. For this query, you will need to use the Invoice, InvoiceLine, Track, Customer,

Album, and Artist tables. Note, this one is tricky because the Total spent in the Invoice table might not be on a single product,

so you need to use the InvoiceLine table to find out how many of each product was purchased, and then multiply this by the price

for each artist.

----- We Use Table ( " Customer " / " Artists " / " Total spent " ) table -----

select \* from customer

select \* from artists

select \* from total spent

----------------------------------------------------------------------------------------------------------

------ we use cte ( Common Table Expression ) It used For Making Temporary Table

WITH best\_selling\_artist AS (

SELECT artist.artist\_id AS artist\_id, artist.name AS artist\_name,

SUM(invoice\_line.unit\_price\*invoice\_line.quantity) AS total\_sales

FROM invoice\_line

JOIN track ON track.track\_id = invoice\_line.track\_id

JOIN album ON album.album\_id = track.album\_id

JOIN artist ON artist.artist\_id = album.artist\_id

GROUP BY 1 -- 1 is our ( artist\_id )

ORDER BY 3 DESC -- 3 is our ( total\_sales )

LIMIT 1

)

SELECT c.customer\_id, c.first\_name, c.last\_name, bsa.artist\_name,

SUM(il.unit\_price\*il.quantity) AS amount\_spent

FROM invoice i

JOIN customer c ON c.customer\_id = i.customer\_id

JOIN invoice\_line il ON il.invoice\_id = i.invoice\_id

JOIN track t ON t.track\_id = il.track\_id

JOIN album alb ON alb.album\_id = t.album\_id

JOIN best\_selling\_artist bsa ON bsa.artist\_id = alb.artist\_id

GROUP BY 1,2,3,4 ---- Here 1 is ( customer\_id ) , 2 is ( first\_name ) , 3 is ( last name ) , 4 is ( artist name )

ORDER BY 5 DESC; ---- 5 is ( Amount Spent )

**Q2:** We want to find out the most popular music Genre for each country. We determine the most popular genre as the genre

with the highest amount of purchases. Write a query that returns each country along with the top Genre. For countries where

the maximum number of purchases is shared return all Genres.

----- There are two parts in question- first most popular music genre and second need data at country level.

------ Table used ( " invoice " , " genere " ) table -----

select \* from invoice

select \* from genere

---------------------------------------------------------------

---------- **Method 1: Using CTE \*** ----------

---- If you want highest value from (like country / numbers ) we are using ( Row\_Number ) for highest output

WITH popular\_genre AS

(

SELECT COUNT(invoice\_line.quantity) AS purchases, customer.country, genre.name, genre.genre\_id,

ROW\_NUMBER() OVER(PARTITION BY customer.country ORDER BY COUNT(invoice\_line.quantity) DESC) AS RowNo

FROM invoice\_line

JOIN invoice ON invoice.invoice\_id = invoice\_line.invoice\_id

JOIN customer ON customer.customer\_id = invoice.customer\_id

JOIN track ON track.track\_id = invoice\_line.track\_id

JOIN genre ON genre.genre\_id = track.genre\_id

GROUP BY 2,3,4

ORDER BY 2 ASC, 1 DESC

)

SELECT \* FROM popular\_genre WHERE RowNo <= 1

-------------**Method 2: Using Recursive** ---------------

WITH RECURSIVE

sales\_per\_country AS(

SELECT COUNT(\*) AS purchases\_per\_genre, customer.country, genre.name, genre.genre\_id

FROM invoice\_line

JOIN invoice ON invoice.invoice\_id = invoice\_line.invoice\_id

JOIN customer ON customer.customer\_id = invoice.customer\_id

JOIN track ON track.track\_id = invoice\_line.track\_id

JOIN genre ON genre.genre\_id = track.genre\_id

GROUP BY 2,3,4

ORDER BY 2

),

max\_genre\_per\_country AS (SELECT MAX(purchases\_per\_genre) AS max\_genre\_number, country

FROM sales\_per\_country

GROUP BY 2

ORDER BY 2)

SELECT sales\_per\_country.\*

FROM sales\_per\_country

JOIN max\_genre\_per\_country ON sales\_per\_country.country = max\_genre\_per\_country.country

WHERE sales\_per\_country.purchases\_per\_genre = max\_genre\_per\_country.max\_genre\_number;

Q3: Write a query that determines the customer that has spent the most on music for each country.

Write a query that returns the country along with the top customer and how much they spent.

For countries where the top amount spent is shared, provide all customers who spent this amount.

Steps to Solve: Similar to the above question. There are two parts in question-

first find the most spent on music for each country and second filter the data for respective customers.

----------------- **Method 1: using CTE** ----------------------

WITH Customter\_with\_country AS (

SELECT customer.customer\_id,first\_name,last\_name,billing\_country,SUM(total) AS total\_spending,

ROW\_NUMBER() OVER(PARTITION BY billing\_country ORDER BY SUM(total) DESC) AS RowNo

FROM invoice

JOIN customer ON customer.customer\_id = invoice.customer\_id

GROUP BY 1,2,3,4

ORDER BY 4 ASC,5 DESC)

SELECT \* FROM Customter\_with\_country WHERE RowNo <= 1

---------------- **Method 2: Using Recursive** ----------------

WITH RECURSIVE

customter\_with\_country AS (

SELECT customer.customer\_id,first\_name,last\_name,billing\_country,SUM(total) AS total\_spending

FROM invoice

JOIN customer ON customer.customer\_id = invoice.customer\_id

GROUP BY 1,2,3,4

ORDER BY 2,3 DESC),

country\_max\_spending AS(

SELECT billing\_country,MAX(total\_spending) AS max\_spending

FROM customter\_with\_country

GROUP BY billing\_country)

SELECT cc.billing\_country, cc.total\_spending, cc.first\_name, cc.last\_name, cc.customer\_id

FROM customter\_with\_country cc

JOIN country\_max\_spending ms

ON cc.billing\_country = ms.billing\_country

WHERE cc.total\_spending = ms.max\_spending

ORDER BY 1;