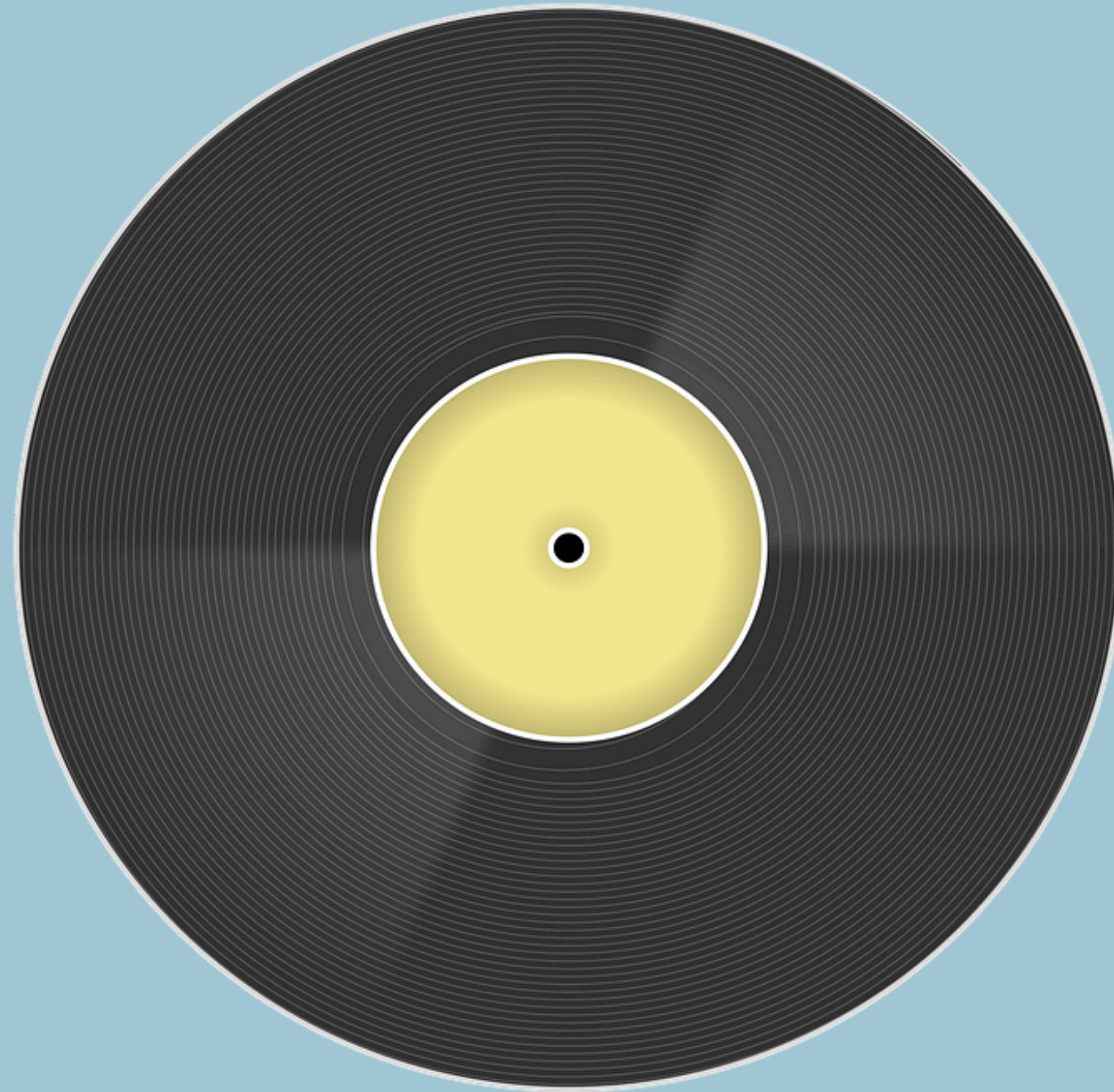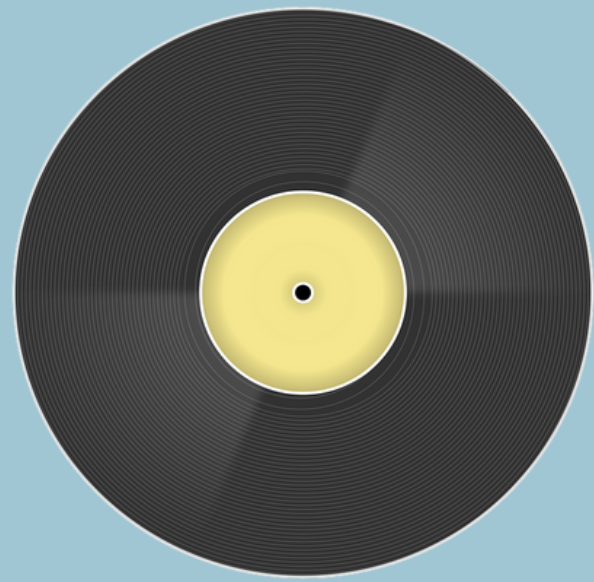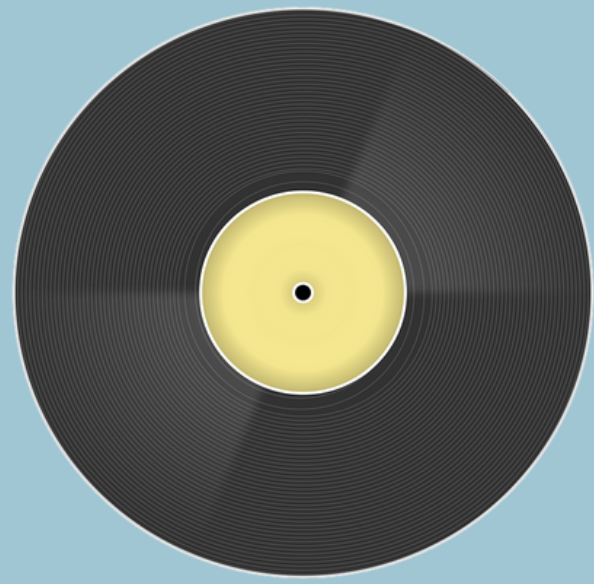# Introduction

Hello, my name is Ashish

This data analysis project focuses on the music store, utilizing SQL queries to explore and answer specific questions about business.
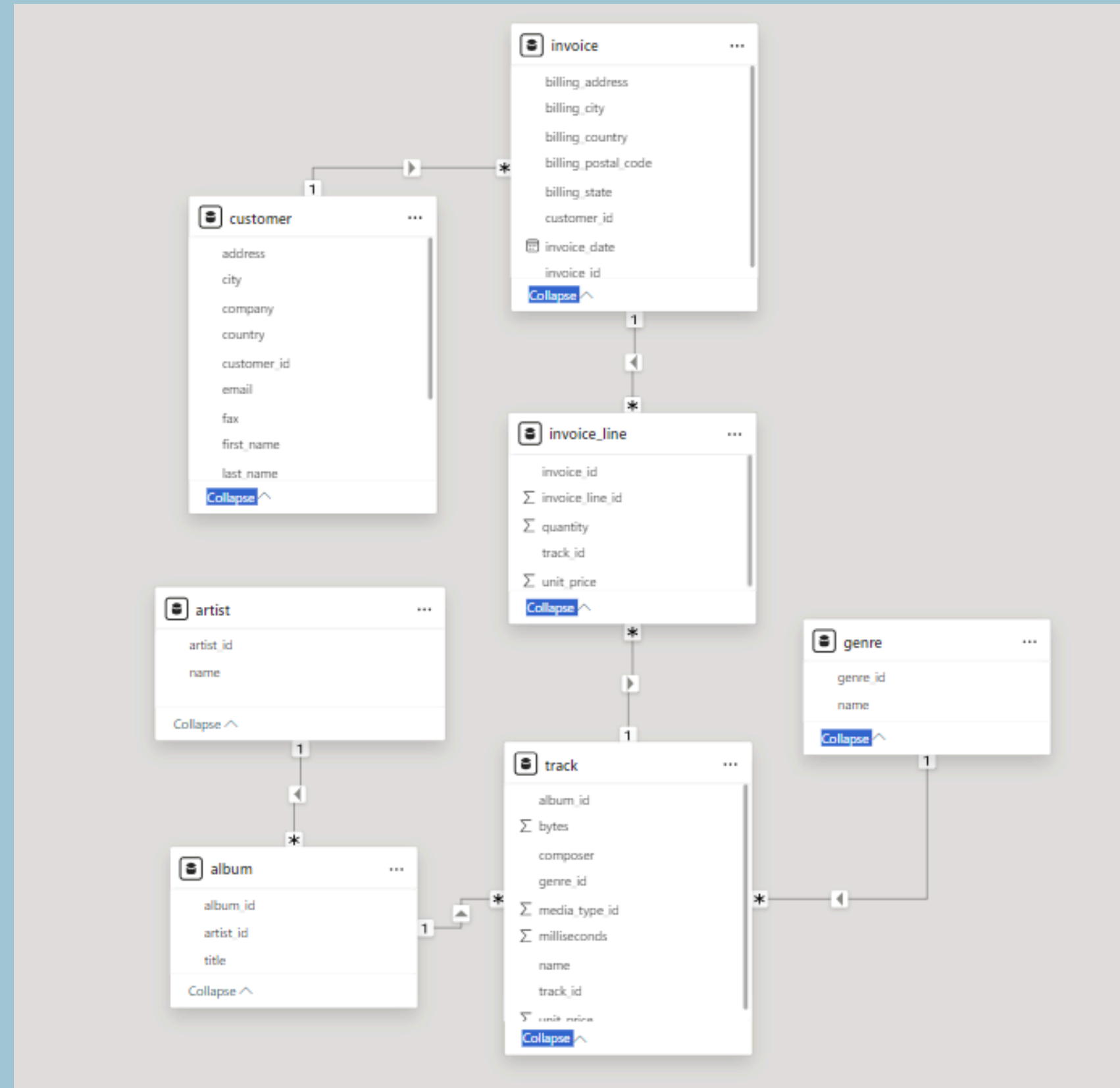
Business Problem

This project aims to analyze the music store's business performance to identify key factors affecting sales. By examining sales data, customer feedback, market trends, and inventory dynamics, we seek to uncover opportunities for improvement. The insights gained will inform targeted strategies to enhance revenue and better serve our customers.

Schema Diagram

Which year has the highest and the lowest sales and how many total invoices and customers are there in those year?

```sql
select year(invoice_date) as year,count(i.invoice_id) as total_invoices,round(sum(il.unit_price * il.quantity),2) as Total_sales,count(distinct c.customer_id) as number_of_customers
from customer as c
join invoice i on c.customer_id=i.customer_id
join invoice_line il on i.invoice_id=il.invoice_id
group by 1
order by Total_sales desc
limit 1;
```

year	total_invoices	Total_sales	number_of_customers
2019	1234	1221.66	54

```sql
select year(invoice_date) as year,count(i.invoice_id) as total_invoices,round(sum(il.unit_price * il.quantity),2) as Total_sales,count(distinct c.customer_id) as number_of_customers
from customer as c
join invoice i on c.customer_id=i.customer_id
join invoice_line il on i.invoice_id=il.invoice_id
group by 1
order by Total_sales asc
limit 1;
```

year	total_invoices	Total_sales	number_of_customers
2020	1150	1138.5	58

Which country has the highest and the lowest sales and how many customers are there

```sql
select c.country,count(i.invoice_id) as total_invoices,round(sum(il.unit_price * il.quantity),2) as total_sales,count(distinct c.customer_id) as number_of_customers
from customer as c
join invoice i on c.customer_id=i.customer_id
join invoice_line il on i.invoice_id=il.invoice_id
group by 1
order by 3 desc
limit 1;
```

	country	total_invoices	total_sales	number_of_customers
▶	USA	1051	1040.49	13

```sql
select c.country,count(i.invoice_id) as total_invoices,round(sum(il.unit_price * il.quantity),2) as total_sales,count(distinct c.customer_id) as number_of_customers
from customer as c
join invoice i on c.customer_id=i.customer_id
join invoice_line il on i.invoice_id=il.invoice_id
group by 1
order by 3 asc
limit 1;
```

	country	total_invoices	total_sales	number_of_customers
▶	Denmark	38	37.62	1

What are the top 3 cities in each country based on sales

```sql
with top_3_cities as
(
    select c.country,c.city,round(sum(il.unit_price * il.quantity),2) as total_sales,
    row_number() over(partition by c.country order by sum(il.quantity*il.unit_price) desc) as row_num from customer as c
    join invoice i on c.customer_id=i.customer_id
    join invoice_line il on i.invoice_id=il.invoice_id
    group by 1,2
)
select * from top_3_cities
where row_num <=3
order by 1 asc,3 desc;
```

	country	city	total_sales	row_num
	Brazil	SÃ£o Paulo	129.69	1
	Brazil	SÃ£o JosÃ© dos Campos	108.9	2
	Brazil	BrasÃlia	106.92	3
	Canada	MontrÃ©al	99.99	1
	Canada	Ottawa	91.08	2

Which top 3 cities have the highest and the lowest sales overall

```
select i.billing_country,i.billing_city,round(sum(il.unit_price * il.quantity),2) as total_sales
from invoice as i
join invoice_line il on i.invoice_id=il.invoice_id
group by 1,2
order by 3 desc
limit 3;
```

	billing_country	billing_city	total_sales
▶	Czech Republic	Prague	273.24
	USA	Mountain View	169.29
	United Kingdom	London	166.32

```
select i.billing_country,i.billing_city,round(sum(il.unit_price * il.quantity),2) as total_sales
from invoice as i
join invoice_line il on i.invoice_id=il.invoice_id
group by 1,2
order by 3 asc
limit 3;
```

	billing_country	billing_city	total_sales
▶	Canada	Edmonton	29.7
	Denmark	Copenhagen	37.62
	Argentina	Buenos Aires	39.6

What are the top 3 most popular genre in each country based on sales

```sql
with top_3_genre as
(
    select c.country,g.name,round(sum(il.unit_price * il.quantity),2) as total_sales,
    row_number() over(partition by c.country order by sum(il.quantity*il.unit_price) desc) as row_num from customer as c
    join invoice i on c.customer_id=i.customer_id
    join invoice_line il on i.invoice_id=il.invoice_id
    join track t on t.track_id=il.track_id
    join genre g on g.genre_id = t.genre_id
    group by 1,2
)
select country,name,Total_sales,Row_num from top_3_genre
where row_num <=3
group by 1,2
order by 1 asc,3 desc;
```

	country	name	Total_sales	Row_num
	Brazil	Rock	25.74	1
	Brazil	Jazz	13.86	2
	Brazil	Metal	11.88	3
	Canada	Rock	56.43	1
	Canada	Metal	21.78	2

What are the top 3 most popular and least popular genre overall based on invoices

```sql
select g.name,count(i.invoice_id) as Total_invoices
from customer as c
join invoice i on c.customer_id=i.customer_id
join invoice_line il on i.invoice_id=il.invoice_id
join track t on t.track_id=il.track_id
join genre g on g.genre_id = t.genre_id
group by 1
order by 2 desc
limit 3;
```

name	Total_invoices
Rock	390
Metal	124
Blues	23

```sql
select g.name,count(i.invoice_id) as Total_invoices
from customer as c
join invoice i on c.customer_id=i.customer_id
join invoice_line il on i.invoice_id=il.invoice_id
join track t on t.track_id=il.track_id
join genre g on g.genre_id = t.genre_id
group by 1
order by 2 asc
limit 3;
```

name	Total_invoices
Reggae	2
Alternative & Punk	12
Latin	19

Who are the top customers from each country

```sql
with top_customer as
(
    Select c.country,c.customer_id,c.first_name,c.last_name,round(sum(il.unit_price*il.quantity),2) as purchase,
    dense_rank() over(partition by c.country order by sum(il.unit_price*il.quantity) desc) as dr from customer c
    join invoice i on c.customer_id=i.customer_id
    join invoice_line il on i.invoice_id=il.invoice_id
    group by 1,2,3,4
    order by 1 asc,5 desc
)
Select * from top_customer
where dr<=1 ;
```

	country	customer_id	first_name	last_name	purchase	dr
▶	Argentina	56	Diego	GutiÃ©rrez	39.6	1
	Australia	55	Mark	Taylor	81.18	1
	Austria	7	Astrid	Gruber	69.3	1
	Belgium	8	Daan	Peeters	60.39	1
	Brazil	1	LuÃs	GonÃ§alves	108.9	1

Who are the top customers from each country

Alternative to find top customer with recursive cte

```sql
with recursive
    all_customers as(
        Select c.country,c.customer_id,c.first_name,c.last_name,round(sum(il.unit_price*il.quantity),2) as purchase from customer as c
        join invoice i on c.customer_id=i.customer_id
        join invoice_line il on i.invoice_id=il.invoice_id
        group by 1,2,3,4
        order by 1 asc,5 desc
    ),

top_customer as (select country,max(purchase) as purchase
from all_customers
group by 1
order by 1 asc,2 desc)

select ac.* from all_customers as ac,
top_customer as tc
where ac.country=tc.country and ac.purchase=tc.purchase;
```

country	customer_id	first_name	last_name	purchase	dr
Argentina	56	Diego	GutiÃ©rrez	39.6	1
Australia	55	Mark	Taylor	81.18	1
Austria	7	Astrid	Gruber	69.3	1
Belgium	8	Daan	Peeters	60.39	1
Brazil	1	LuÃs	GonÃ§alves	108.9	1

Who are the top artists from each country based on total invoice

```sql
with top_artist as
(
    Select c.country,ar.artist_id,ar.name,count(i.invoice_id) as total_invoice,
    dense_rank() over(partition by c.country order by sum(il.unit_price*il.quantity) desc) as dr from customer c
    join invoice i on c.customer_id=i.customer_id
    join invoice_line il on i.invoice_id=il.invoice_id
    join track t on t.track_id=il.track_id
    join album al on al.album_id=t.album_id
    join artist ar on al.artist_id=ar.artist_id
    group by 1,2,3
    order by 1 asc,4 desc
)
Select * from top_artist
where dr<=1
order by 4 desc ;
```

	country	artist_id	name	total_invoice	dr
▶	USA	1	AC/DC	29	1
	United Kingdom	1	AC/DC	29	1
	Canada	3	Aerosmith	22	1
	Germany	8	Audioslave	17	1
	Australia	3	Aerosmith	15	1

Who are the top artists from each country based on total invoice

Alternative to find top artist with recursive cte

```sql
with recursive
    all_artists as(
        Select c.country,ar.artist_id,ar.name,count(i.invoice_id) as total_invoice from customer as c
        join invoice i on c.customer_id=i.customer_id
        join invoice_line il on i.invoice_id=il.invoice_id
        join track t on t.track_id=il.track_id
        join album al on al.album_id=t.album_id
        join artist ar on al.artist_id=ar.artist_id
        group by 1,2,3
        order by 1 asc,4 desc
    ),

top_artist as (select country,max(total_invoice) as total_invoice
from all_artists
group by 1)

select aa.* from all_artists as aa,
top_artist as ta
where ta.country=aa.country and ta.total_invoice=aa.total_invoice
order by 4 desc ;
```

country	artist_id	name	total_invoice	dr
USA	1	AC/DC	29	1
United Kingdom	1	AC/DC	29	1
Canada	3	Aerosmith	22	1
Germany	8	Audioslave	17	1
Australia	3	Aerosmith	15	1

What are the top 3 tracks of each artist based on total invoice

```sql
with top_tracks as
(
    Select  ar.artist_id,ar.name,t.track_id,t.track_name,count(il.invoice_id) as total_invoice,
    row_number() over(partition by ar.artist_id order by sum(il.unit_price*il.quantity) desc) as rn from invoice_line as il
    join track t on t.track_id=il.track_id
    join album al on al.album_id=t.album_id
    join artist ar on al.artist_id=ar.artist_id
    group by 1,2,3,4
    order by 1 asc,5 desc
)
Select * from top_tracks
where rn<=3 ;
```

	artist_id	name	track_id	track_name	total_invoice	rn
▶	1	AC/DC	6	Put The Finger On You	13	1
	1	AC/DC	13	Night Of The Long Knives	10	2
	1	AC/DC	9	Snowballed	9	3
	2	Accept	4	Restless and Wild	4	1
	2	Accept	2	Balls to the Wall	3	2

Suggestions

1. Rock and metal genres are more popular and generate higher sales than other music types. To capitalize on this opportunity, the client should focus on targeted promotions and collaborations with popular bands for exclusive releases. These strategies can effectively boost sales and strengthen the brand's presence in the market.

2. Denmark currently has the lowest customer base, resulting in minimal sales and invoices. To enhance sales performance, the client should consider organizing music events to showcase a diverse range of genres. These events can effectively attract new audiences, increase brand visibility, and create valuable opportunities for revenue growth.

3. The top three cities with the lowest sales are Edmonton (Canada), Copenhagen (Denmark), and Buenos Aires (Argentina). To boost revenue in these markets, the client can offer discounts and promote top artists like AC/DC and Aerosmith through events and targeted advertisements. This approach can attract more customers, increase engagement, and ultimately drive higher sales in these cities.