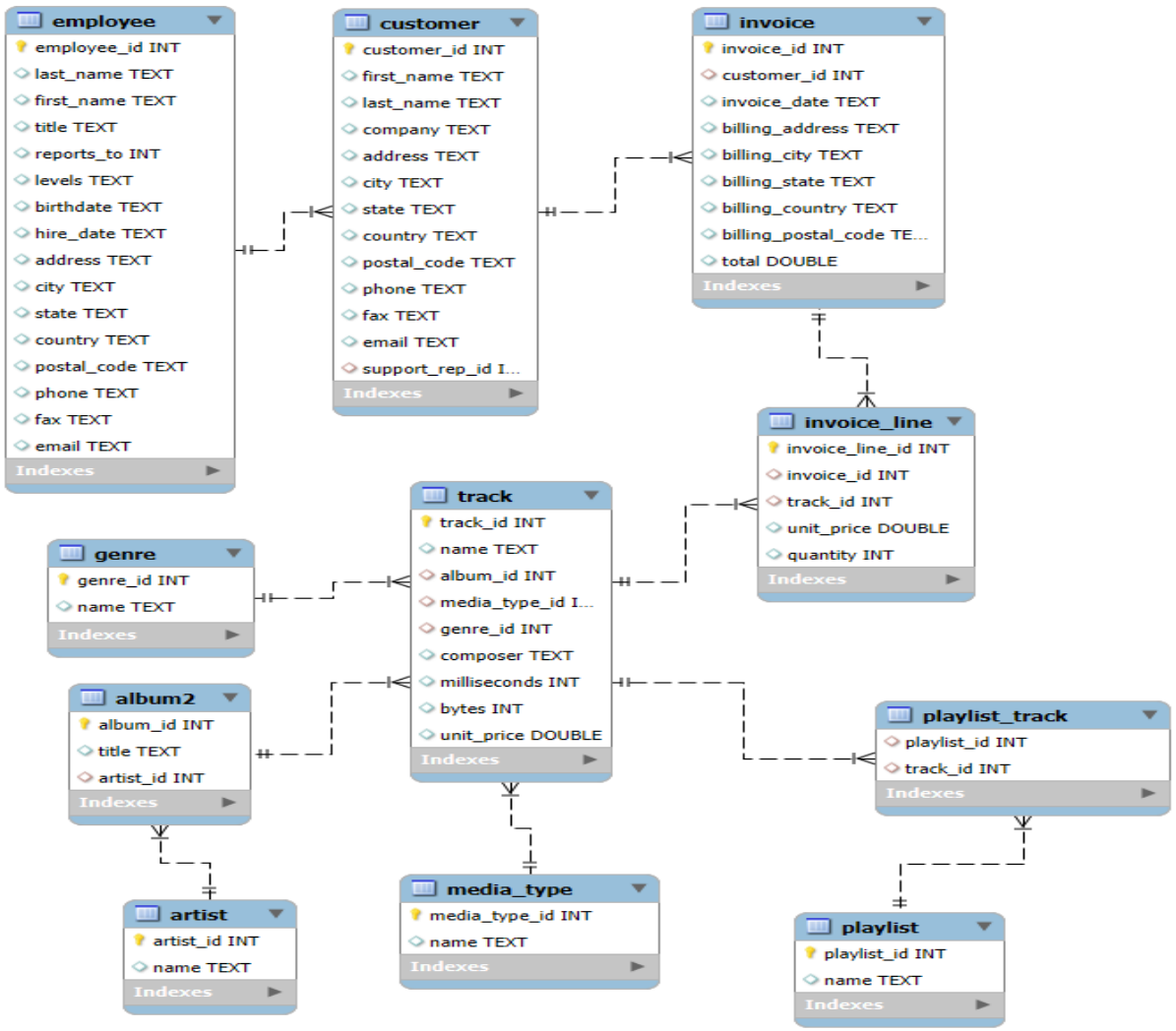
Music Store Data Analysis

- ## Problem Statement:

You are tasked with analyzing a music store's database to provide meaningful insights into sales performance, customer behavior, and product popularity. The data includes details about customers, artists, albums, tracks, and sales (invoices). Your goal is to write SQL queries that help the store optimize its sales strategy, improve customer targeting, and manage inventory efficiently.

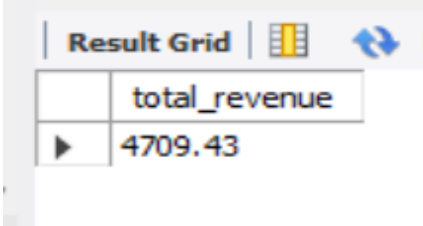
ER Diagram.



Sales Analysis:

1. What is the total revenue generated by the music store?

```
-- 1. What is the total revenue generated by the music store?
select round(sum(unit_price*quantity),2) as total_revenue from invoice_line;
```

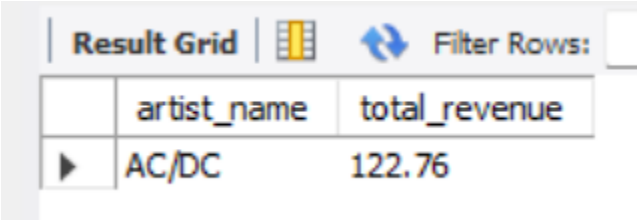


Result Grid

	total_revenue
▶	4709.43

2. Which artist generated the highest revenue?

```
-- 2.Which artist generated the highest revenue?
select a.name as artist_name,round(sum(inv.unit_price*inv.quantity),2) as total_revenue from artist as  a
join album2 as  al
on a.artist_id=al.artist_id
join track as t
on al.album_id=t.album_id
join invoice_line as  inv
on t.track_id=inv.track_id
group by a.name
order by total_revenue desc
limit 1
;
```



Result Grid Filter Rows:

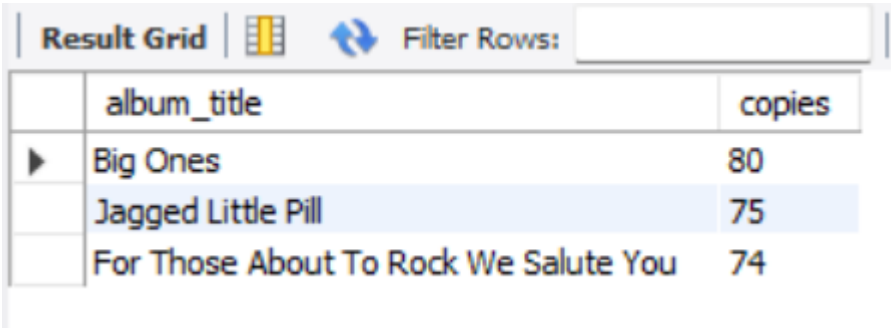
	artist_name	total_revenue
▶	AC/DC	122.76

Insight: The artist which generated the highest revenue is AC/DC.

Recommendation: Promote and feature this artist more often in newsletters, playlists, or homepage banners

3. Which three album has sold the most copies ?

```
-- 3. Which three album has sold the most copies ?
select a.title as album_title,sum(inv.quantity) as copies from album2 as a
join track as t
on a.album_id=t.album_id
join invoice_line as inv
on t.track_id=inv.track_id
group by a.title
order by copies desc
limit 3;
```



Result Grid | Filter Rows:

album_title	copies
Big Ones	80
Jagged Little Pill	75
For Those About To Rock We Salute You	74

Insight: These are the top-selling albums and it reveal customer preferences.

4. What are the total sales per genre?

```
-- 4.What are the total sales per genre?
select g.name as genre_name,round(sum(inv.unit_price*inv.quantity),2) as total_sales from genre as g
join track as t
on g.genre_id=t.genre_id
join invoice_line as inv
on t.track_id=inv.track_id
group by genre_name
order by total_sales desc;
```

Result Grid | Filter Rows:

genre_name	total_sales
Rock	386.1
Metal	122.76
Blues	22.77
Jazz	21.78
Latin	18.81
Alternative & Punk	11.88
Reggae	1.98

Insight: Top selling genre is Rock and lowest is Reggae.

Recommendation: Expand inventory and focus recommendations around top genres

5.what are the sales trend over the years?

```
-- 5.what are the sales trend over the years?
select year(invoice_date) as year ,round(sum(total),2) as total_sales from invoice
group by year;
```

Result Grid | Fil

year	total_sales
2017	1201.86
2018	1147.41
2019	1221.66
2020	1138.5

Insight: In Year 2019 highest Revenue was generated and in 2020 lowest revenue was generated.

6.what are monthly sales trend ?

```sql
-- 6.what are monthly sales trend ?
select monthname(invoice_date) as month ,
round(sum(total),2) as total_sales from invoice
group by month;
```

Result Grid | Filter Rov

month	total_sales
January	438.57
February	414.81
March	456.39
April	442.53
May	368.28
June	380.16
July	395.01
August	426.69
September	386.1
October	345.51
November	291.06
December	364.32

Insight: Highest revenue generates in the month of March and lowest in November.

Recommendation: Run promotions during low sales months to smooth revenue trends

7. what is the total no of quantity sold by music store?

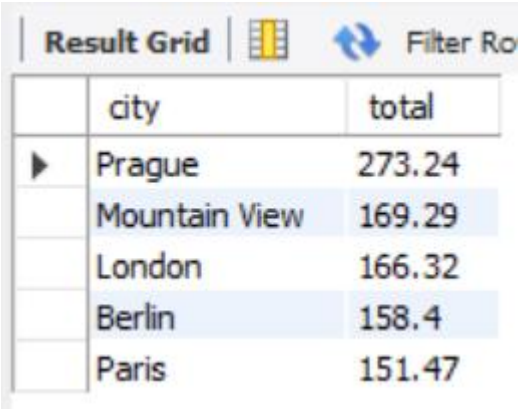
```sql
-- 7. what is the total no of quantity sold by music store?
select sum(quantity) as total_quantity from invoice_line;
```

Result Grid

total_quantity
4757

8. Write a query that returns five cities that has the highest sum of invoice totals. Return both the city name & sum of all invoice totals

```
-- 8. Write a query that returns five cities that
-- has the highest sum of invoice totals. Return both the city name & sum of all invoice totals
select c.city,round(sum(i.total),2) as total from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by c.city
order by total desc
limit 5;
```



city	total
Prague	273.24
Mountain View	169.29
London	166.32
Berlin	158.4
Paris	151.47

Insight: These Cities generate the most sales.

Recommendation: Target these cities with localized ads or events.

9. Write a query that returns five cities that has the lowest sum of invoice totals. Return both the city name & sum of all invoice totals

```
-- 9. Write a query that returns five cities that
-- has the lowest sum of invoice totals. Return both the city name & sum of all invoice totals
select c.city,round(sum(i.total),2) as total from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by c.city
order by total
limit 5;
```

Result Grid | Filter

city	total
Edmonton	29.7
Copenhagen	37.62
Buenos Aires	39.6
Toronto	40.59
Rome	50.49

Insight: These Cities generates minimal sales.

Recommendation: Consider localized promotions, or investigate if language barriers exist.

10.On which days of the week do most purchases happen?

```
-- 10.On which days of the week do most purchases happen?
select dayname(i.invoice_date) as day ,sum(inv.quantity) as purchase_quantity from invoice as i
join invoice_line as inv
on i.invoice_id=inv.invoice_id
group by day
order by purchase_quantity desc;
```

Result Grid | Filter Rows:

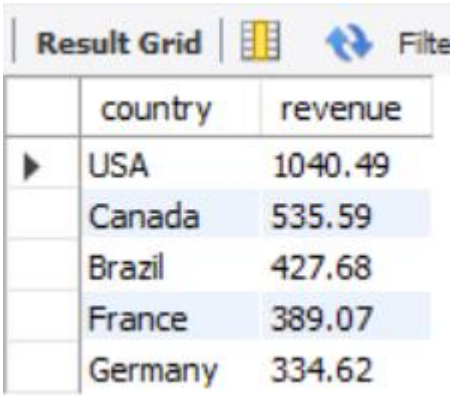
day	purchase_quantity
Saturday	753
Friday	747
Tuesday	736
Wednesday	724
Thursday	602
Sunday	600
Monday	595

Insight: Most purchases happen on **Saturday and Friday**.

Recommendation: Schedule promotional emails or discounts on these peak days.

11.Which five countries generate the highest revenue?

```
-- 11.Which five countries generate the highest revenue?
select c.country,round(sum(i.total),2) as revenue from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by country
order by revenue desc
limit 5;
```



Result Grid | Filte

	country	revenue
▶	USA	1040.49
	Canada	535.59
	Brazil	427.68
	France	389.07
	Germany	334.62

Insight: These countries generate the highest revenue.

Recommendation: Expand partnerships or artist promotion in these countries.

12.Which five countries generate the lowest revenue?

```
-- 12.Which five countries generate the lowest revenue?
select c.country,round(sum(i.total),2) as revenue from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by country
order by revenue
limit 5;
```

Result Grid | Filter Ro

country	revenue
Denmark	37.62
Argentina	39.6
Italy	50.49
Belgium	60.39
Netherlands	65.34

Insight: These countries generate the lowest revenue.

Recommendation: Use targeted social media ads, offer subscription discounts in these countries.

Customer Insights:

1. Who are the top 5 customers by total purchase amount?

```
-- 1. Who are the top 5 customers by total purchase amount?
select c.first_name,c.last_name,round(sum(i.total),2) as purchase_amount from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by c.first_name,c.last_name
order by purchase_amount desc
limit 5;
```

Result Grid | Filter Rows:

first_name	last_name	purchase_amount
FrantiÅiek	WichterlovÃi	144.54
Helena	HolÃ½	128.7
Hugh	O'Reilly	114.84
Manoj	Pareek	111.87
LuÃ-s	GonÃ§alves	108.9

Insight: These are the top spenders.

Recommendation: Offer loyalty rewards or exclusive content to high-value customers.

2. How many unique customers bought music from each country?

```
-- 2. How many unique customers bought music from each country?
select c.country,count(distinct i.customer_id) as unique_customer from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by c.country
order by unique_customer desc;
```

Result Grid | Filter Rows:

country	unique_customer
USA	13
Canada	8
Brazil	5
France	5
Germany	4
United Kingdom	3
Czech Republic	2
India	2
Portugal	2
Argentina	1
Australia	1
Austria	1
Belgium	1
Chile	1
Denmark	1
Finland	1
Hungary	1
Ireland	1
Italy	1
Netherlands	1
Norway	1
Poland	1
Spain	1
Sweden	1

Insight: USA has the highest number of unique buyers.

Recommendation: Focus marketing efforts in this region for customer acquisition and retention.

3. What is the average purchase value per customer?

```
-- 3. What is the average purchase value per customer?
select round(sum(i.total)/count(distinct c.customer_id),2) as average_purchase_value  from customer as c
join invoice as i
on c.customer_id=i.customer_id;
```

Result Grid | Filter Rows:

average_purchase_value
79.82

Insight: On average, each customer spends **$79.82**.

Recommendation: Encourage more purchases per customer with upsells, recommendations, or free shipping thresholds.

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

```
-- 4.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
with cte as (select c.country,c.customer_id,c.first_name,c.last_name,round(sum(i.total),2) as total
 from customer as c
join invoice as i
on c.customer_id=i.customer_id
group by 1,2,3,4)
select country ,first_name,last_name,total from
(select *,dense_rank() over(partition by country order by total desc) as rnk from cte ) as temp
where rnk=1
order by total desc;
```

Result Grid | Filter Rows: | Export:

country	first_name	last_name	total
Ireland	Hugh	O'Reilly	114.84
India	Manoj	Pareek	111.87
Brazil	LuÃ-s	GonÃ§alves	108.9
Portugal	JoÃ£o	Fernandes	102.96
Canada	FranÃ§ois	Tremblay	99.99
France	Wyatt	Girard	99.99
Spain	Enrique	MuÃ±oz	98.01
United Kingdom	Phil	Hughes	98.01
USA	Jack	Smith	98.01
Chile	Luis	Rojas	97.02
Germany	Fynn	Zimmermann	94.05
Australia	Mark	Taylor	81.18
Finland	Terhi	HÃ¤mÃ¤lÃ¤i...	79.2
Hungary	Ladislav	KovÃ¡cs	78.21
Poland	StanisÅ‚aw	WÃ³jcik	76.23

Insight: These are the Top spenders from each country.

Recommendation: Build localized loyalty programs or recognize these users with VIP rewards.

Product Popularity:

1. Which track is the most popular by number of sales?

```sql
-- 1. Which track is the most popular by number of sales?
select t.name as track_name , sum(inv.quantity) as total_quantity from invoice_line as inv
join track as t
on inv.track_id=t.track_id
group by track_name
order by total_quantity desc
limit 1;
```

Result Grid | Filter Rows:

	track_name	total_quantity
▶	Put The Finger On You	13

Insight: The track **Put The Finger On You** is the most sold.

Recommendation: Feature this song in playlists and suggest similar tracks.

2. What is the average price of tracks by genre?

```sql
-- 2. What is the average price of tracks by genre?
select g.name as genre_name,round(avg(t.unit_price),2) as average_price from track as t
join genre as g
on t.genre_id=g.genre_id
group by genre_name;
```

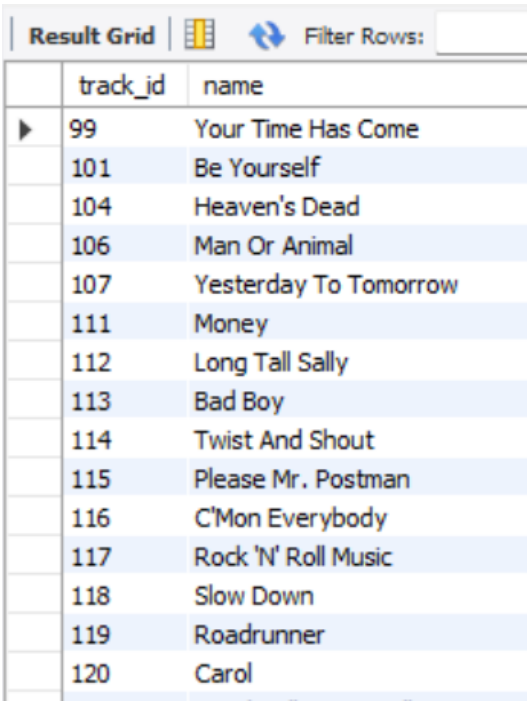
Result Grid | Filter Rows:

	genre_name	average_price
▶	Rock	0.99
	Jazz	0.99
	Metal	0.99
	Alternative & Punk	0.99
	Rock And Roll	0.99
	Blues	0.99
	Latin	0.99
	Reggae	0.99
	Pop	0.99
	Soundtrack	0.99

Insight: All tracks have same average price.

3.List tracks that have never been sold.

```sql
-- 3.List tracks that have never been sold.
select track_id,name from track
where track_id not in (select track_id from invoice_line);
```



Result Grid | Filter Rows:

track_id	name
99	Your Time Has Come
101	Be Yourself
104	Heaven's Dead
106	Man Or Animal
107	Yesterday To Tomorrow
111	Money
112	Long Tall Sally
113	Bad Boy
114	Twist And Shout
115	Please Mr. Postman
116	C'Mon Everybody
117	Rock 'N' Roll Music
118	Slow Down
119	Roadrunner
120	Carol

Insight: These are tracks that have never been sold

Recommendation: Evaluate these for removal, bundling, or retargeting with new marketing strategies.

4 . Which is the most popular genre?

```sql
-- 4. Which is the most popular genre?
select g.name as genre_name  ,sum(inv.quantity) as quantity from invoice_line as inv
join track as t
on inv.track_id=t.track_id
join genre as g
on t.genre_id=g.genre_id
group by g.name
order by quantity desc
limit 1;
```

Result Grid | Filter Ro

	genre_name	quantity
▶	Rock	390

Insight: **Rock** is the genre which is most purchased by quantity.

Recommendation: Expand catalog and curate genre-specific offers.

5.Identify five albums that are top-selling per artist.

```
-- 5.Identify five albums that are top-selling per artist.
with cte as (select a.artist_id, a.name as artist_name,al.title as album_name ,
sum(inv.quantity) as total_quantity
from invoice_line as inv
join track as t
on inv.track_id=t.track_id
join album2 as al
on t.album_id=al.album_id
join artist as a
on al.artist_id=a.artist_id
group by a.artist_id,artist_name,al.title
order by a.artist_id )

select artist_name,album_name,max_quantity from
(select *,max(total_quantity) over(partition by artist_id) as max_quantity
from cte) as temp
where total_quantity=max_quantity
order by max_quantity desc
limit 5;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content

	artist_name	album_name	max_quantity
▶	Aerosmith	Big Ones	80
	Alanis Morissette	Jagged Little Pill	75
	AC/DC	For Those About To Rock We Salute You	74
	Alice In Chains	Facelift	59
	Black Sabbath	Black Sabbath	39

Insight: These are the artist and their top selling album.

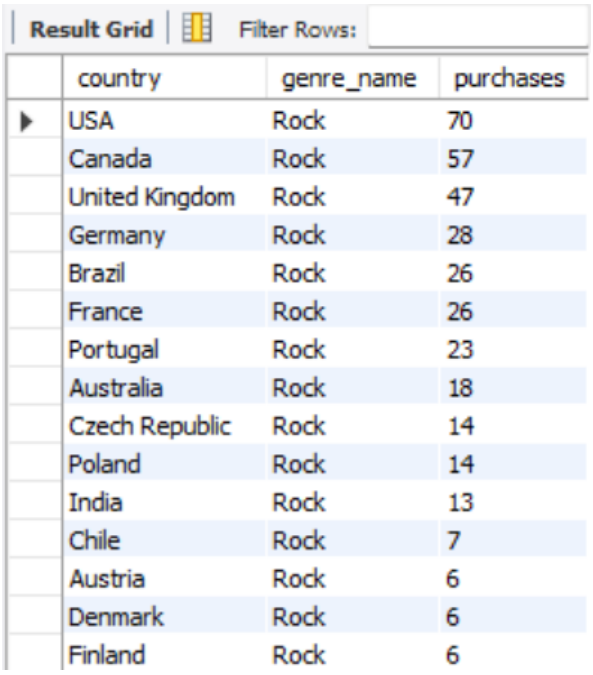
Recommendation: Use this to curate best-of lists or promote sequels/spinoffs.

6 .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 quer that returns each country along with the top Genre. For countries where the maximum number of purchases is shared return all Genres

```
-- 6.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

with cte as (select c.country ,g.name as genre_name,sum(inv.quantity) as purchases from customer as c
join invoice as i
on c.customer_id=i.customer_id
join invoice_line as inv
on i.invoice_id=inv.invoice_id

join track as t
on inv.track_id=t.track_id
join genre as g
on t.genre_id=g.genre_id
group by c.country,genre_name),
cte1 as (select * ,dense_rank() over(partition by country order by purchases desc) as rnk from cte)
select country,genre_name,purchases from cte1
where rnk=1
order by purchases desc;
```



Result Grid | Filter Rows:

country	genre_name	purchases
USA	Rock	70
Canada	Rock	57
United Kingdom	Rock	47
Germany	Rock	28
Brazil	Rock	26
France	Rock	26
Portugal	Rock	23
Australia	Rock	18
Czech Republic	Rock	14
Poland	Rock	14
India	Rock	13
Chile	Rock	7
Austria	Rock	6
Denmark	Rock	6
Finland	Rock	6

Insight: **Rock is most popular in almost many country.**

Recommendation: Localize music offerings and marketing by country preferences.

7.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

```
-- 7.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

select name as track_name,milliseconds as song_length from track
where milliseconds>(select avg(milliseconds) from track)
order by song_length desc;
```

Result Grid | Filter Rows: | Export

track_name	song_length
How Many More Times	711836
Advance Romance	677694
Sleeping Village	644571
You Shook Me(2)	619467
Talkin' 'Bout Women Obviously	589531
Stratus	582086
No More Tears	555075
The Alchemist	509413
Wheels Of Confusion / The Straightener	494524
Book Of Thel	494393
You Oughta Know (Alternate)	491885
Terra	482429
Snoopy's search-Red baron	456071
Sozinho (Hitmakers Classic Mix)	436636
Master Of Puppets	436453

Final Summary:-

This project explored the sales, customer, and product data of a digital music store using SQL. Through structured querying and business-focused analysis, we derived key insights that reveal how revenue is distributed across regions, what products are most profitable, and which customer segments offer the highest value.

Key findings include:

- A small number of artists and albums contribute to a majority of the store's revenue.
- Rock and Pop genres dominate in both popularity and average price.
- Several tracks and albums have never been purchased, revealing opportunities to optimize the product catalog.
- Top-spending customers and high-revenue countries suggest where to focus loyalty and marketing efforts.
- Underperforming countries like Brazil and Chile highlight the need for localized promotion and pricing strategies.

Throughout this analysis, SQL was used to write optimized, multi-table queries involving joins, aggregations, common table expression and window functions to answer real-world business questions.