DIGITAL MUSIC STORE
DATA ANALYSIS

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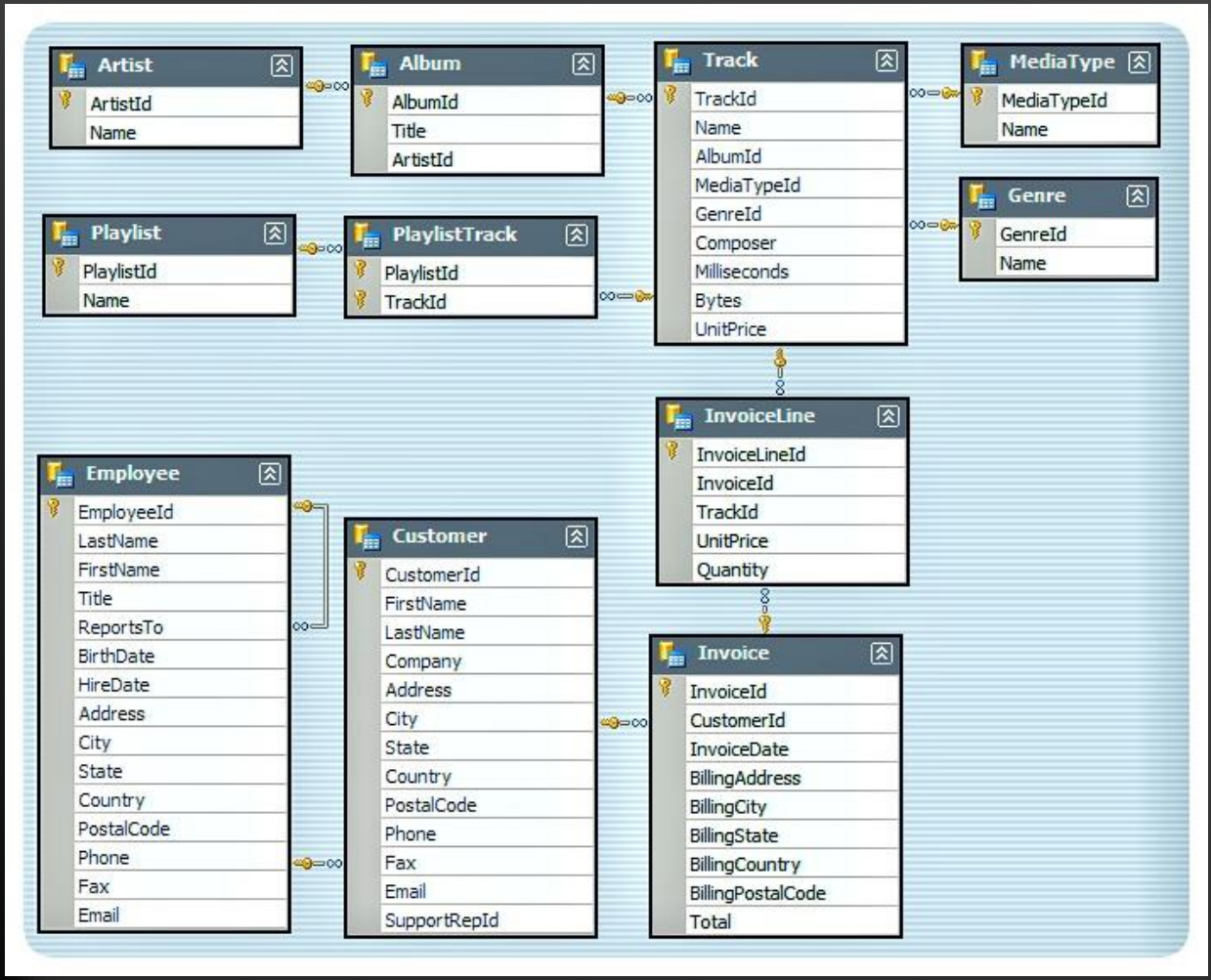
OBJECTIVES

- This SQL project is to perform in-depth data analysis of a digital music store database, extracting valuable insights to inform business decisions and enhance operational efficiency.
- The analysis will focus on several key areas, addressing specific requests from stakeholders like top-selling genres, Analyze purchase behavior to identify segments for targeted marketing campaigns.
- Evaluate the impact of promotional campaigns on sales revenue, Analyze customer acquisition channels and conversion rates, Determine if there are regional preferences in music genres or artists.
- By addressing these specific requests and leveraging SQL queries to extract and analyze data from the digital music store database.
- The project aims to provide actionable insights that drive business growth, improve customer satisfaction, and optimize operational processes.

INPUT DATA



This dataset comprises various dimension tables such as Customer details, Artist, Genre, Invoice, Track etc...

AD-HOC REQUESTS ALONG WITH THE

- QUERIES
- QUERIED RESULTS
- VISUALIZATIONS
- INSIGHTS

REQUEST 1

Which countries have the most Invoices?

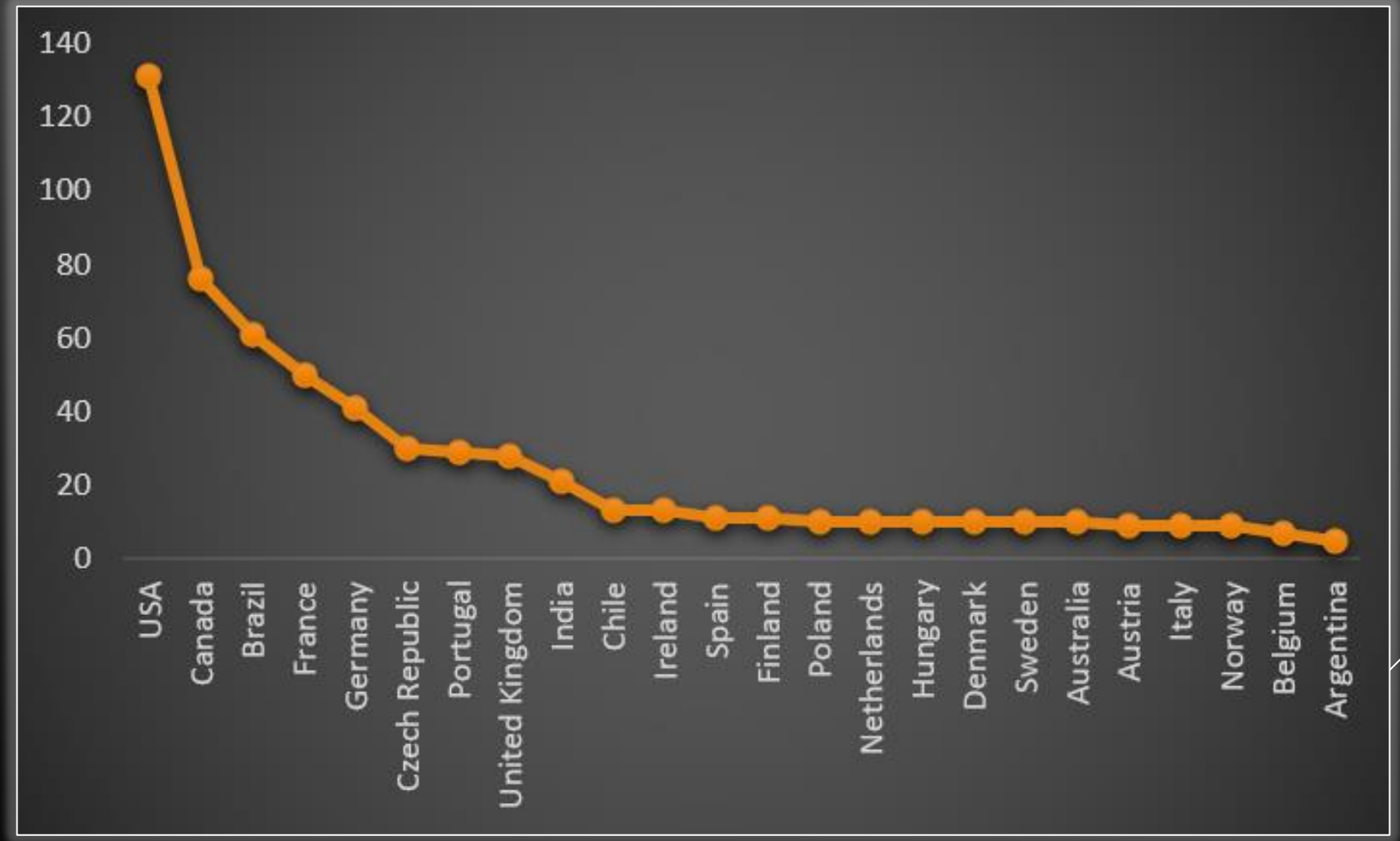
QUERY

```
SELECT billing_country AS country,
COUNT(total) AS count
FROM invoice
GROUP BY country
ORDER BY count DESC
```

OUTPUT

	country character varying (30)	count bigint
1	USA	131
2	Canada	76
3	Brazil	61
4	France	50
5	Germany	41
6	Czech Republic	30
7	Portugal	29
8	United Kingdom	28
9	India	21
10	Chile	13
11	Ireland	13
12	Spain	11
13	Finland	11
14	Australia	10
15	Netherlands	10
16	Sweden	10
17	Poland	10
18	Hungary	10
19	Denmark	10
20	Austria	9
21	Norway	9
22	Italy	9
23	Belgium	7
24	Argentina	5

VISUAL


140
120
100
80
60
40
20
0
USA
Canada
Brazil
France
Germany
Czech Republic
Portugal
United Kingdom
India
Chile
Ireland
Spain
Finland
Poland
Netherlands
Hungary
Denmark
Sweden
Australia
Austria
Italy
Norway
Belgium
Argentina

INSIGHTS

- The USA dominates as the largest market for the digital music store, with 131 customers, followed by Canada, Brazil, France, and Germany, indicating significant market presence in North America and Europe.
- Regional variations are evident, with some countries showing lower customer counts, such as Argentina and Belgium, suggesting potential areas for targeted marketing or expansion efforts.
- Opportunities for growth exist in countries with moderate customer counts like India, Sweden, and Poland, which could benefit from localized marketing strategies.
- Market saturation is apparent in countries with high customer counts like the USA and Canada, while others may offer untapped potential for increased market penetration.

REQUEST 2

Who is the senior most employee based on job title?

QUERY

```
SELECT employee_id,last_name,first_name
FROM employee
ORDER BY levels DESC
LIMIT 1
```

OUTPUT

employee_id [PK] character varying (50)	last_name character	first_name character
9	Madan	Mohan

INSIGHTS

As the senior-most employee, Madan Mohan likely possesses significant expertise in their field and may hold a leadership position, guiding teams, and shaping strategic initiatives.

REQUEST 3

What are top 3 values of total invoice?

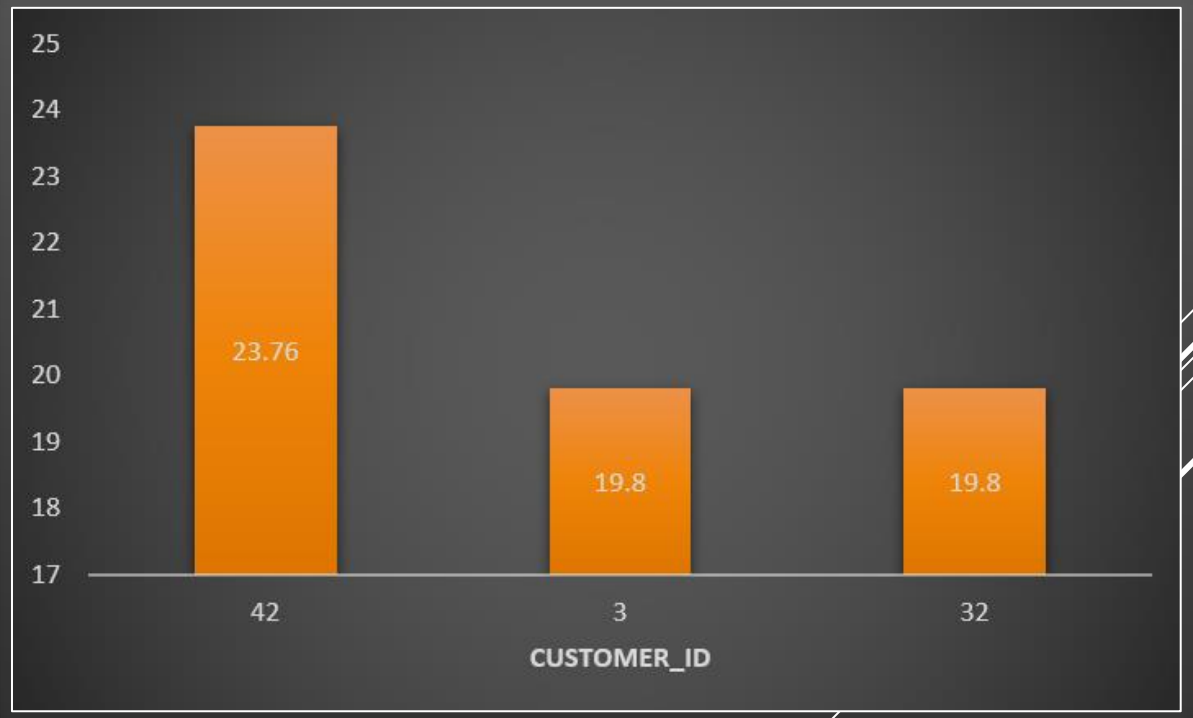
QUERY

```
SELECT customer_id, total
FROM invoice
ORDER BY total DESC
LIMIT 3
```

OUTPUT

customer_id integer	total double precision
42	23.759999999999998
32	19.8
3	19.8

VISUAL



INSIGHTS

- Customer 42 emerges as the top spender with a total of 23.76, indicating significant contribution to revenue.
- Customers 32 and 3 share identical spending totals of 19.8, suggesting similar purchasing behaviors.
- Identifying high-value customers like Customer 42 is crucial for tailored marketing strategies and retention efforts.
- Consistent monitoring of individual spending metrics allows for effective evaluation of marketing campaign performance.
- Insights from customer spending patterns inform targeted approaches to maximize revenue generation and enhance customer retention.

REQUEST 4

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

QUERY

```
SELECT billing_city AS city, SUM(total) AS total
FROM invoice
GROUP BY city
ORDER BY total DESC
LIMIT 1
```

OUTPUT

city character varying (30)	total double precision
Prague	273.24000000000007

INSIGHTS

Prague stands out as the city with the highest total invoice of 273.24, indicating that customers in Prague collectively spent the most money compared to other cities.

REQUEST 5

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.

QUERY

```
SELECT customer.customer_id,customer.last_name,
SUM(invoice.total) AS total
FROM customer
JOIN invoice ON invoice.customer_id=customer.customer_id
GROUP BY customer.customer_id
ORDER BY total DESC
LIMIT 1
```

OUTPUT

customer_id [PK] integer	last_name character	total double precision
5	Madhav	144.54000000000002

INSIGHTS

Providing exceptional customer service and personalized experiences to Madhav can foster loyalty and strengthen the business relationship, ensuring continued patronage and potentially leading to positive word-of-mouth referrals.

REQUEST 6

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

QUERY

```
SELECT DISTINCT customer.customer_id,customer.first_name,
customer.last_name,customer.email
FROM customer
JOIN invoice ON invoice.customer_id = customer.customer_id
JOIN invoice_line ON invoice_line.invoice_id = invoice.invoice_id
JOIN track ON track.track_id=invoice_line.track_id
JOIN genre ON genre.genre_id=track.genre_id
WHERE genre.name LIKE 'Rock'
ORDER BY customer.email
```

OUTPUT

	customer_id [PK] integer	first_name character	last_name character	email character varying (50)
1	32	Aaron	Mitchell	aaronmitchell@yahoo.ca
2	11	Alexandre	Rocha	alero@uol.com.br
3	7	Astrid	Gruber	astrid.gruber@apple.at
4	4	Bjørn	Hansen	bjorn.hansen@yahoo.no
5	39	Camille	Bernard	camille.bernard@yahoo.fr
6	8	Daan	Peeters	daan_peeters@apple.be
7	56	Diego	Gutiérrez	diego.gutierrez@yahoo.ar
8	20	Dan	Miller	dmiller@comcast.com
9	40	Dominique	Lefebvre	dominiquelefebvre@gmail.c...
10	30	Edward	Francis	edfrancis@yachoo.ca
11	10	Eduardo	Martins	eduardo@woodstock.com.br
12	33	Ellie	Sullivan	ellie.sullivan@shaw.ca
13	52	Emma	Jones	emma_jones@hotmail.com
14	50	Enrique	Muñoz	enrique_munoz@yahoo.es
15	13	Fernanda	Ramos	fernadaramos4@uol.com.br

	customer_id [PK] integer	first_name character	last_name character	email character varying (50)
16	16	Frank	Harris	fharris@google.com
17	24	Frank	Ralston	fralston@gmail.com
18	3	François	Tremblay	ftremblay@gmail.com
19	37	Fynn	Zimmermann	fzimmermann@yahoo.de
20	36	Hannah	Schneider	hannah.schneider@yahoo.de
21	6	Helena	Holý	hholy@gmail.com
22	22	Heather	Leacock	hleacock@gmail.com
23	46	Hugh	O'Reilly	hughoreilly@apple.ie
24	43	Isabelle	Mercier	isabelle_mercier@apple.fr
25	17	Jack	Smith	jacksmith@microsoft.com
26	15	Jennifer	Peterson	jenniferp@rogers.ca
27	34	João	Fernandes	jfernandes@yahoo.pt
28	51	Joakim	Johansson	joakim.johansson@yahoo.se
29	48	Johannes	Van der Berg	johavanderberg@yahoo.nl
30	23	John	Gordon	johngordon22@yahoo.com

	customer_id [PK] integer	first_name character	last_name character	email character varying (50)
31	28	Julia	Barnett	jubarnett@gmail.com
32	21	Kathy	Chase	kachase@hotmail.com
33	9	Kara	Nielsen	kara.nielsen@jubii.dk
34	45	Ladislav	Kovács	ladislav_kovacs@apple.hu
35	2	Leonie	Köhler	leonekohler@surfeu.de
36	47	Lucas	Mancini	lucas.mancini@yahoo.it
37	1	Luís	Gonçalves	luisg@embraer.com.br
38	57	Luis	Rojas	luisrojas@yahoo.cl
39	58	Manoj	Pareek	manoj.pareek@rediff.com
40	41	Marc	Dubois	marc.dubois@hotmail.com
41	55	Mark	Taylor	mark.taylor@yahoo.au
42	31	Martha	Silk	marthasilk@gmail.com
43	35	Madalena	Sampaio	masampaio@sapo.pt
44	18	Michelle	Brooks	michelleb@aol.com
45	14	Mark	Philips	mphilips12@shaw.ca

	customer_id [PK] integer	first_name character	last_name character	email character varying (50)
45	14	Mark	Philips	mphilips12@shaw.ca
46	38	Niklas	Schröder	nschroder@surfeu.de
47	27	Patrick	Gray	patrick.gray@aol.com
48	53	Phil	Hughes	phil.hughes@gmail.com
49	59	Puja	Srivastava	puja_srivastava@yahoo.in
50	5	R	Madhav	r.madhav@jetbrains.com
51	26	Richard	Cunningham	ricunningham@hotmail.com
52	29	Robert	Brown	robbrown@shaw.ca
53	12	Roberto	Almeida	roberto.almeida@riotur.gov.br
54	49	Stanisław	Wójcik	stanisław.wójcik@wp.pl
55	54	Steve	Murray	steve.murray@yahoo.uk
56	44	Terhi	Hämäläinen	terhi.hamalainen@apple.fi
57	19	Tim	Goyer	tgoyer@apple.com
58	25	Victor	Stevens	vstevens@yahoo.com
59	42	Wyatt	Girard	wyatt.girard@yahoo.fr

INSIGHTS

- Analyzing the list of Rock music listeners provides insights into their demographic characteristics, listening habits, and potential interests.
- This information can inform content curation strategies, playlist recommendations, and targeted advertising campaigns to enhance customer satisfaction and retention within this segment.

REQUEST 7

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.

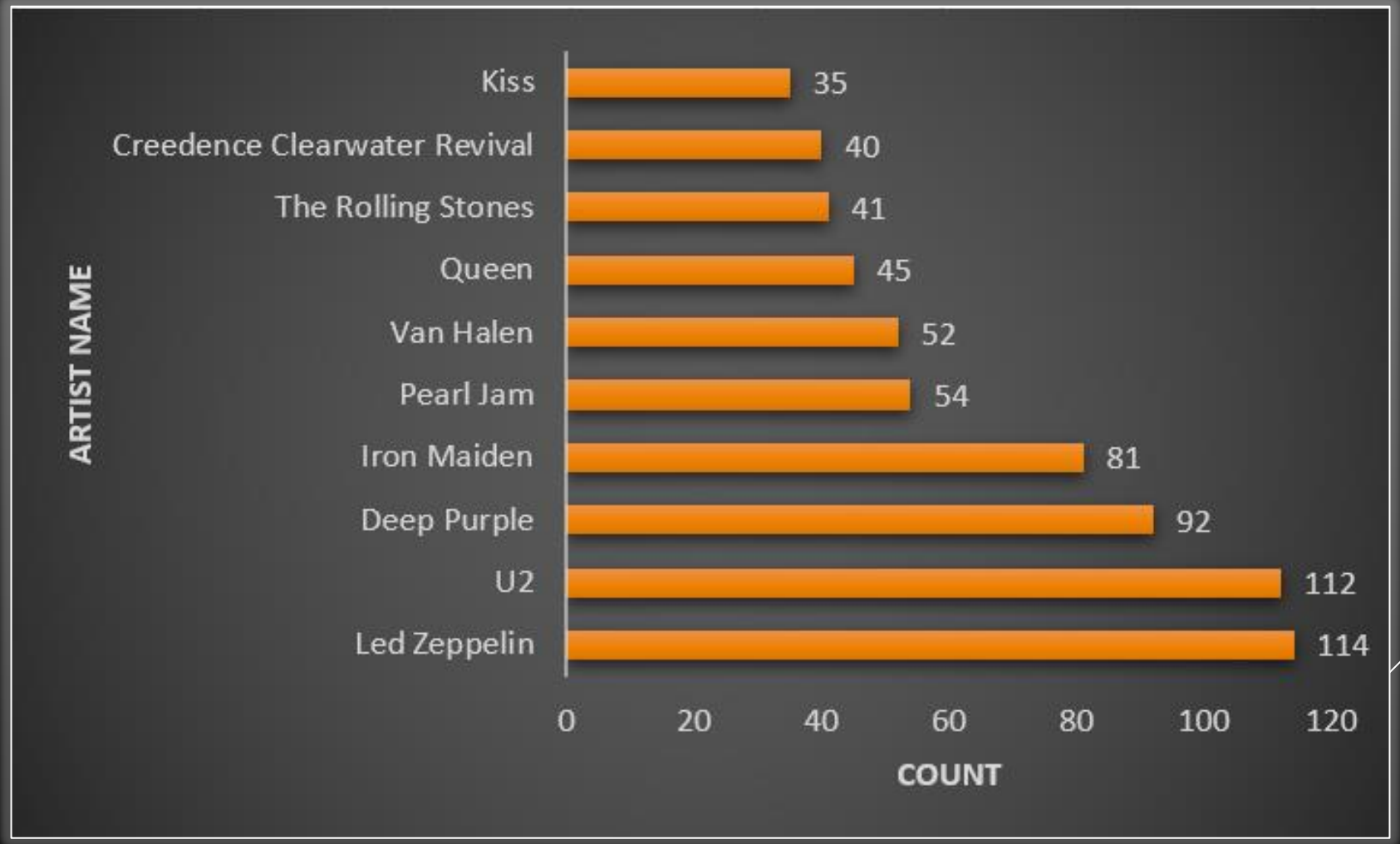
QUERY

```
SELECT artist.artist_id,artist.name,
COUNT(genre.name) as count
FROM artist
JOIN album ON album.artist_id=artist.artist_id
JOIN track ON track.album_id=album.album_id
JOIN genre ON genre.genre_id=track.genre_id
WHERE genre.name LIKE 'Rock'
GROUP BY artist.artist_id
ORDER BY count DESC
LIMIT 10
```

OUTPUT

artist_id [PK] character varying (50)	name character varying (120)	count bigint
22	Led Zeppelin	114
150	U2	112
58	Deep Purple	92
90	Iron Maiden	81
118	Pearl Jam	54
152	Van Halen	52
51	Queen	45
142	The Rolling Stones	41
76	Creedence Clearwater Revival	40
52	Kiss	35

VISUAL


ARTIST NAME
Kiss
35
Creedence Clearwater Revival
40
The Rolling Stones
41
Queen
45
Van Halen
52
Pearl Jam
54
Iron Maiden
81
Deep Purple
92
U2
112
Led Zeppelin
114
0
20
40
60
80
100
120
COUNT

INSIGHTS

- Led Zeppelin and U2 emerge as the foremost contributors, with 114 and 112 compositions respectively, underscoring their substantial impact on the genre.
- Notable rock bands like Deep Purple, Iron Maiden, and Pearl Jam follow closely, with significant numbers of compositions, showcasing a diverse range of influential artists.
- These insights offer valuable guidance for music curation, playlist creation, and targeted promotional strategies to engage rock music enthusiasts effectively.
- Leveraging the popularity and influence of these top rock artists can enhance audience engagement and satisfaction, driving increased user interaction and retention on the platform.

REQUEST 8

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 .

QUERY

```
SELECT name,milliseconds
FROM track
WHERE milliseconds>(
    SELECT avg(milliseconds)
    FROM track
)
ORDER BY milliseconds DESC
```

OUTPUT

	name character varying (150)	milliseconds integer
1	Occupation / Precipice	5286953
2	Through a Looking Glass	5088838
3	Greetings from Earth, Pt. 1	2960293
4	The Man With Nine Lives	2956998
5	Battlestar Galactica, Pt. 2	2956081
6	Battlestar Galactica, Pt. 1	2952702
7	Murder On the Rising Star	2935894
8	Battlestar Galactica, Pt. 3	2927802
9	Take the Celestra	2927677
10	Fire In Space	2926593
11	The Long Patrol	2925008
12	The Magnificent Warriors	2924716
13	The Living Legend, Pt. 1	2924507
14	The Gun On Ice Planet Zero, Pt. 2	2924341

INSIGHTS

- They likely feature intricate arrangements or extended instrumental sections, appealing to listeners seeking deeper musical experiences.
- Such tracks may represent genres like progressive rock or classical music known for their longer compositions, reflecting diverse artistic styles within the dataset.
- Understanding the presence of these longer tracks allows for targeted recommendations and curated playlists, enhancing user satisfaction and engagement with the platform.
- Analyzing listener interactions and feedback with these longer tracks can provide further insights into audience preferences and guide future content curation strategies.

REQUEST 9

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

QUERY

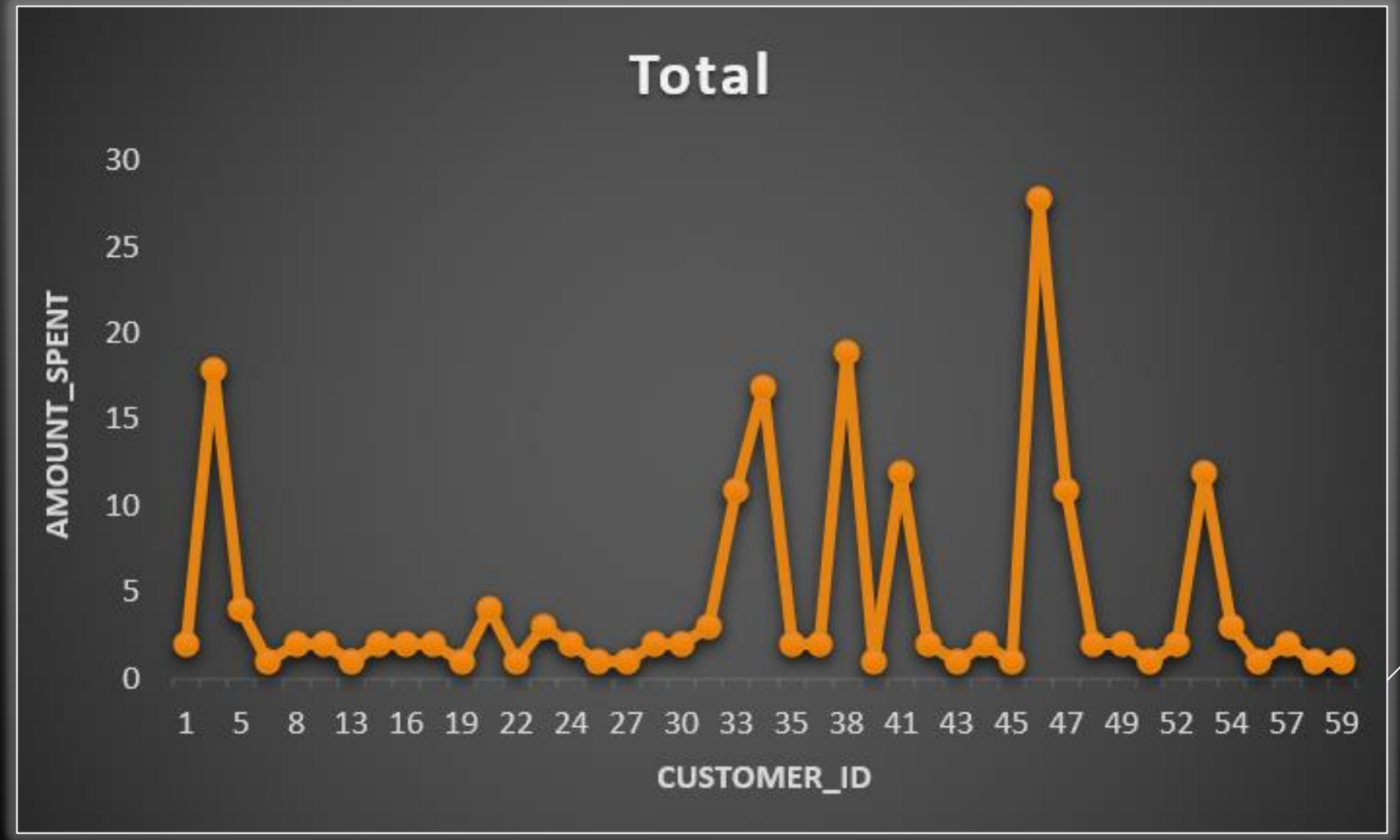
```
WITH best_selling_artist AS (
    SELECT artist.artist_id AS artist_id,artist.name AS artist_name,
    SUM(invoice_line.unit_price*invoice_line.quantity) AS total_sales
    FROM invoice_line
    JOIN track ON track.track_id=invoice_line.track_id
    JOIN album ON album.album_id=track.album_id
    JOIN artist ON artist.artist_id=album.artist_id
    GROUP BY artist.artist_id
    ORDER BY total_sales DESC
    LIMIT 1
)
SELECT customer.customer_id, customer.first_name, customer.last_name, best_selling_artist.artist_name,
SUM(invoice_line.unit_price*invoice_line.quantity) AS amount_spent
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 album ON album.album_id=track.album_id
JOIN best_selling_artist ON best_selling_artist.artist_id=album.artist_id
GROUP BY customer.customer_id,customer.first_name,customer.last_name,best_selling_artist.artist_name
ORDER BY amount_spent DESC
```

OUTPUT

	customer_id integer	first_name character	last_name character	artist_name character varying (120)	amount_spent double precision
1	46	Hugh	O'Reilly	Queen	27.719999999999985
2	38	Niklas	Schröder	Queen	18.81
3	3	François	Tremblay	Queen	17.82
4	34	João	Fernandes	Queen	16.830000000000002
5	53	Phil	Hughes	Queen	11.88
6	41	Marc	Dubois	Queen	11.88
7	47	Lucas	Mancini	Queen	10.89
8	33	Ellie	Sullivan	Queen	10.89
9	20	Dan	Miller	Queen	3.96
10	5	R	Madhav	Queen	3.96
11	23	John	Gordon	Queen	2.9699999999999998
12	54	Steve	Murray	Queen	2.9699999999999998
13	31	Martha	Silk	Queen	2.9699999999999998
14	16	Frank	Harris	Queen	1.98
15	17	Jack	Smith	Queen	1.98
16	24	Frank	Ralston	Queen	1.98

	customer_id integer	first_name character	last_name character	artist_name character varying (120)	amount_spent double precision
17	30	Edward	Francis	Queen	1.98
18	35	Madalena	Sampaio	Queen	1.98
19	36	Hannah	Schneider	Queen	1.98
20	11	Alexandre	Rocha	Queen	1.98
21	8	Daan	Peeters	Queen	1.98
22	42	Wyatt	Girard	Queen	1.98
23	44	Terhi	Hämäläinen	Queen	1.98
24	1	Luís	Gonçalves	Queen	1.98
25	48	Johannes	Van der Berg	Queen	1.98
26	49	Stanisław	Wójcik	Queen	1.98
27	52	Emma	Jones	Queen	1.98
28	57	Luis	Rojas	Queen	1.98
29	15	Jennifer	Peterson	Queen	1.98
30	28	Julia	Barnett	Queen	1.98
31	27	Patrick	Gray	Queen	0.99
32	58	Manoj	Pareek	Queen	0.99

VISUAL


Total
AMOUNT_SPENT
30
25
20
15
10
5
0
1 5 8 13 16 19 22 24 27 30 33 35 38 41 43 45 47 49 52 54 57 59
CUSTOMER_ID

INSIGHTS

- Varied spending levels among customers, with some like Hugh O'Reilly spending significantly higher amounts compared to others like Isabelle Mercier.
- Presence of repeat purchases across the customer base, indicating sustained interest in Queen's music over time.
- High-spending customers like Hugh O'Reilly, Niklas Schroder, and François Tremblay signify strong affinity or frequent purchases of Queen's music.
- Understanding spending distribution provides insights into customer engagement levels and opportunities for targeted marketing efforts.
- Tailoring marketing strategies to retain existing high-spending customers and attract new ones presents potential for maximizing revenue from Queen's music sales.

REQUEST 10

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 .

QUERY

```
WITH popular_genre as
(
    SELECT COUNT(invoice_line.quantity) 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
```

OUTPUT

	purchases bigint	country character varying (	name character varying (12	genre_id character vary	rowno bigint
1	17	Argentina	Alternative & Punk	4	1
2	34	Australia	Rock	1	1
3	40	Austria	Rock	1	1
4	26	Belgium	Rock	1	1
5	205	Brazil	Rock	1	1
6	333	Canada	Rock	1	1
7	61	Chile	Rock	1	1
8	143	Czech Republic	Rock	1	1
9	24	Denmark	Rock	1	1
10	46	Finland	Rock	1	1
11	211	France	Rock	1	1
12	194	Germany	Rock	1	1
13	44	Hungary	Rock	1	1
14	102	India	Rock	1	1
15	72	Ireland	Rock	1	1
16	35	Italy	Rock	1	1
16	35	Italy	Rock	1	1
17	33	Netherlands	Rock	1	1
18	40	Norway	Rock	1	1
19	40	Poland	Rock	1	1
20	108	Portugal	Rock	1	1
21	46	Spain	Rock	1	1
22	60	Sweden	Rock	1	1
23	166	United Kingdom	Rock	1	1
24	561	USA	Rock	1	1

INSIGHTS

- Rock emerges as the most popular genre in all listed countries, including the USA, Brazil, and France.
- This consistency underscores Rock's universal appeal and enduring popularity globally.
- Despite cultural differences, Rock music maintains its dominance, reflecting its significant influence on global music culture.
- Understanding Rock's popularity enables businesses to tailor their music catalog and marketing strategies accordingly.
- Leveraging Rock's widespread appeal presents opportunities for maximizing revenue generation and audience engagement in diverse markets.

RECOMMENDATIONS FOR ENHANCING DIGITAL MUSIC STORE PERFORMANCE

- Utilize customer segmentation for targeted marketing and personalized recommendations.
- Analyze sales data to understand genre, artist, and track popularity for effective inventory management.
- Implement predictive analytics for forecasting sales and customer behavior.
- Develop recommendation systems to enhance user engagement and drive sales.
- Explore geographic data for market expansion opportunities and localization efforts.
- Analyze customer feedback, and ensure data security and compliance for continuous improvement and customer satisfaction.

THANK YOU!

HOW TO REACH ME ?

Mail – kotikoteswararao9999@gmail.com

Koteswara Rao Nadikoti