Generating SQL for SQLite using Ollama, ChromaDB

This notebook runs through the process of using the vanna Python package to generate SQL using AI (RAG + LLMs) including connecting to a database and training. If you're not ready to train on your own database, you can still try it using a sample SQLite database.

Which LLM do you want to use?

- OpenAl via Vanna.Al (Recommended)
 Use Vanna.Al for free to generate your queries
- OpenAl

Use OpenAI with your own API key

Azure OpenAl

If you have OpenAI models deployed on Azure

• [Selected] Ollama

Use Ollama locally for free. Requires additional setup.

Mistral via Mistral API

If you have a Mistral API key

Other LLM

If you have a different LLM model

Where do you want to store the 'training' data?

- Vanna Hosted Vector DB (Recommended)
 Use Vanna. Als hosted vector database (pgvector) for free. This is usable across machines with no additional setup.
- [Selected] ChromaDB

Use ChromaDBs open-source vector database for free locally. No additional setup is necessary -- all database files will be created and stored locally.

Margo

Use Margo locally for free. Requires additional setup. Or use their hosted option.

Other VectorDB

Use any other vector database. Requires additional setup.

Setup

!pwd!pip install vanna!pip install 'vanna[chromadb]'!pip install ollama!pip show vanna # 0.6.3 , 0.5.5, 0.2.1!pip show ollama # 0.2.0

```
In [1]: import warnings
import re
```

```
warnings.filterwarnings('ignore', category=DeprecationWarning, message='^Num
# warnings.filterwarnings('ignore', category=DeprecationWarning, message=re.
import os
import re
from time import time
from datetime import datetime

from vanna.ollama import Ollama
from vanna.chromadb.chromadb_vector import ChromaDB_VectorStore
```

```
In [2]: model_name = "qwen2.5:14b" # "qwen2.5" # 'deepseek-coder-v2'
CONFIG = {
        'model': model_name,
}

file_db = "~/Downloads/chinook.sqlite"

clean_and_train = True # False

sql_id = 1
NUM_RETRY = 3

allow_llm_to_see_data = True
# allow_llm_to_see_data (bool): Whether to allow the LLM to see the data (form)
```

```
In [3]: class MyVanna(ChromaDB_VectorStore, Ollama):
            def init (self, config=None):
                ChromaDB VectorStore. init (self, config=config)
                Ollama. init (self, config=config)
        def remove collections(collection name=None, ACCEPTED TYPES = ["sql", "ddl"
            if not collection name:
                collections = ACCEPTED TYPES
            elif isinstance(collection name, str):
                collections = [collection name]
            elif isinstance(collection name, list):
                collections = collection name
                print(f"\t{collection name} is unknown: Skipped")
                return
            for c in collections:
                if not c in ACCEPTED TYPES:
                    print(f"\t{c} is unknown: Skipped")
                    continue
                # print(f"vn.remove collection('{c}')")
                vn.remove collection(c)
        def strip brackets(ddl):
            This function removes square brackets from table and column names in a \Gamma
```

```
Args:
                ddl (str): The DDL script containing square brackets.
            Returns:
                str: The DDL script with square brackets removed.
            # Use regular expressions to match and replace square brackets
            pattern = r"\setminus[([^{]}]+)]" # Match any character except ] within square b
            return re.sub(pattern, r"\1", ddl)
        def my vn ask(question, sql id, allow llm to see data=False, num retry=NUM F
            # allow retry by appending error msg to question
            print(f"\n{separator}\n# QUESTION - {sql id}: {question}\n{separator}\r
            sql, df, fig, err msg = vn.ask(question=question, allow llm to see data=
            if not err msg or ("[ERROR-SQL]" not in err msg) and ("[ERROR-DB]" not i
                return sql, df, fig, err msg
            if err msq and "an unknown error was encountered while running the model
                # re-run
                sql, df, fig, err msg = vn.ask(question=question, allow llm to see d
                if not err msg or ("[ERROR-SQL]" not in err msg) and ("[ERROR-DB]" r
                    return sql, df, fig, err msg
            # re-trv
            for i retry in range(num retry-1):
                msg = f"*** RETRY {i retry+1} ***"
                print(msg)
                question = f"""
                For the question {question},
                the generated SQL statement {sql} results in the following exception
                Please fix the error and re-generate the SQL
                0.00
                sql, df, fig, err msg = vn.ask(question=question, allow llm to see d
                if not err msg or ("[ERROR-SQL]" not in err msg) and ("[ERROR-DB]" r
                    break
            return sql, df, fig, err msg
In [4]: vn = MyVanna(config=CONFIG)
In [5]: hostname = os.uname().nodename
        print("Hostname:", hostname)
       Hostname: ducklover1
In [6]: file db = os.path.abspath(os.path.expanduser(file db))
        vn.connect to sqlite(file db)
In [7]: vn.run sql is set
Out[7]: True
```

```
In [8]: if clean_and_train:
    remove_collections()
```

Training

SQLite sample database

You only need to train once. Do not train again unless you want to add more training data.

In [9]:	df_	_ddl =	vn.run_sql("SELECT type, sql FROM sqlite_master WHERE sql is not nu
In [10]:	df_	ddl	
Out[10]:		type	sql
	0	table	CREATE TABLE "albums"\r\n(\r\n [AlbumId] IN
	1	table	CREATE TABLE sqlite_sequence(name,seq)
	2	table	CREATE TABLE "artists"\r\n(\r\n [ArtistId]
	3	table	CREATE TABLE "customers"\r\n(\r\n [Customer
	4	table	CREATE TABLE "employees"\r\n(\r\n [Employee
	5	table	CREATE TABLE "genres"\r\n(\r\n [GenreId] IN
	6	table	CREATE TABLE "invoices"\r\n(\r\n [InvoiceId
	7	table	CREATE TABLE "invoice_items"\r\n(\r\n [Invo
	8	table	CREATE TABLE "media_types"\r\n(\r\n [MediaT
	9	table	CREATE TABLE "playlists"\r\n(\r\n [Playlist
	10	table	CREATE TABLE "playlist_track"\r\n(\r\n [Pla
	11	table	CREATE TABLE "tracks"\r\n(\r\n [TrackId] IN
	12	index	CREATE INDEX [IFK_AlbumArtistId] ON "albums" (
	13	index	CREATE INDEX [IFK_CustomerSupportRepId] ON "cu
	14	index	CREATE INDEX [IFK_EmployeeReportsTo] ON "emplo
	15	index	CREATE INDEX [IFK_InvoiceCustomerId] ON "invoi
	16	index	CREATE INDEX [IFK_InvoiceLineInvoiceId] ON "in
	17	index	CREATE INDEX [IFK_InvoiceLineTrackId] ON "invo
	18	index	CREATE INDEX [IFK_PlaylistTrackTrackId] ON "pl
	19	index	CREATE INDEX [IFK_TrackAlbumId] ON "tracks" ([
	20	index	CREATE INDEX [IFK_TrackGenreId] ON "tracks" ([
	21	index	CREATE INDEX [IFK_TrackMediaTypeId] ON "tracks
	22	table	CREATE TABLE sqlite_stat1(tbl,idx,stat)

```
if clean_and_train:
    for ddl in df_ddl['sql'].to_list():
        ddl = strip_brackets(ddl)
        vn.train(ddl=ddl)

# Sometimes you may want to add documentation about your business termin
    vn.train(documentation="In the chinook database invoice means order")

    doc_str = """
    In the 'customers' table, address column names do not have 'Billing' pre
    e.g. country column name is 'country', not 'BillingCountry'
    """
    vn.train(documentation=doc_str)
```

```
Adding ddl: CREATE TABLE "albums"
    Albumid INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL.
    Title NVARCHAR(160) NOT NULL,
    ArtistId INTEGER NOT NULL,
    FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistId)
                ON DELETE NO ACTION ON UPDATE NO ACTION
Adding ddl: CREATE TABLE sqlite sequence(name, seq)
Adding ddl: CREATE TABLE "artists"
    ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    Name NVARCHAR(120)
Adding ddl: CREATE TABLE "customers"
    CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    FirstName NVARCHAR(40) NOT NULL,
    LastName NVARCHAR(20) NOT NULL,
    Company NVARCHAR(80),
    Address NVARCHAR(70),
    City NVARCHAR(40),
    State NVARCHAR(40),
    Country NVARCHAR(40),
    PostalCode NVARCHAR(10),
    Phone NVARCHAR(24),
    Fax NVARCHAR(24),
    Email NVARCHAR(60) NOT NULL,
    SupportRepId INTEGER,
    FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId)
                ON DELETE NO ACTION ON UPDATE NO ACTION
Adding ddl: CREATE TABLE "employees"
    EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    LastName NVARCHAR(20) NOT NULL,
    FirstName NVARCHAR(20) NOT NULL,
    Title NVARCHAR(30),
    ReportsTo INTEGER,
    BirthDate DATETIME,
    HireDate DATETIME,
    Address NVARCHAR(70),
    City NVARCHAR(40),
    State NVARCHAR(40),
    Country NVARCHAR(40),
    PostalCode NVARCHAR(10),
    Phone NVARCHAR(24).
    Fax NVARCHAR(24).
    Email NVARCHAR(60),
    FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId)
                ON DELETE NO ACTION ON UPDATE NO ACTION
Adding ddl: CREATE TABLE "genres"
    GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    Name NVARCHAR(120)
```

```
Adding ddl: CREATE TABLE "invoices"
    InvoiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    CustomerId INTEGER NOT NULL,
    InvoiceDate DATETIME NOT NULL,
    BillingAddress NVARCHAR(70),
    BillingCity NVARCHAR(40),
    BillingState NVARCHAR(40),
    BillingCountry NVARCHAR(40),
    BillingPostalCode NVARCHAR(10),
    Total NUMERIC(10,2) NOT NULL,
    FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId)
                ON DELETE NO ACTION ON UPDATE NO ACTION
)
Adding ddl: CREATE TABLE "invoice items"
    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    InvoiceId INTEGER NOT NULL,
    TrackId INTEGER NOT NULL,
    UnitPrice NUMERIC(10,2) NOT NULL,
    Quantity INTEGER NOT NULL,
    FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId)
                ON DELETE NO ACTION ON UPDATE NO ACTION,
    FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId)
                ON DELETE NO ACTION ON UPDATE NO ACTION
Adding ddl: CREATE TABLE "media types"
    MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    Name NVARCHAR(120)
Adding ddl: CREATE TABLE "playlists"
    PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
    Name NVARCHAR(120)
Adding ddl: CREATE TABLE "playlist track"
    PlaylistId INTEGER NOT NULL,
    TrackId INTEGER NOT NULL.
    CONSTRAINT PK_PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),
    FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId)
                ON DELETE NO ACTION ON UPDATE NO ACTION,
    FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId)
                ON DELETE NO ACTION ON UPDATE NO ACTION
Adding ddl: CREATE TABLE "tracks"
    TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL.
    Name NVARCHAR(200) NOT NULL,
    AlbumId INTEGER,
    MediaTypeId INTEGER NOT NULL,
    GenreId INTEGER,
    Composer NVARCHAR(220),
    Milliseconds INTEGER NOT NULL,
```

```
Bytes INTEGER,
            UnitPrice NUMERIC(10,2) NOT NULL,
            FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId)
                        ON DELETE NO ACTION ON UPDATE NO ACTION,
            FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId)
                        ON DELETE NO ACTION ON UPDATE NO ACTION.
            FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaTypeId)
                        ON DELETE NO ACTION ON UPDATE NO ACTION
        Adding ddl: CREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)
        Adding ddl: CREATE INDEX IFK CustomerSupportRepId ON "customers" (SupportRep
        Adding ddl: CREATE INDEX IFK EmployeeReportsTo ON "employees" (ReportsTo)
        Adding ddl: CREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)
        Adding ddl: CREATE INDEX IFK InvoiceLineInvoiceId ON "invoice items" (Invoic
        eId)
        Adding ddl: CREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)
        Adding ddl: CREATE INDEX IFK PlaylistTrackTrackId ON "playlist track" (Track
        Adding ddl: CREATE INDEX IFK TrackAlbumId ON "tracks" (AlbumId)
        Adding ddl: CREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)
        Adding ddl: CREATE INDEX IFK TrackMediaTypeId ON "tracks" (MediaTypeId)
        Adding ddl: CREATE TABLE sqlite stat1(tbl,idx,stat)
        Adding documentation....
        Adding documentation....
In [12]: # show training data
         training data = vn.get training data()
         training data
```

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	id	question	content	training_data_type
0	039f9d54-59f7-5f29- 8c04-14dbc3e95671- ddl	None	CREATE TABLE "artists"\r\n(\r\n ArtistId IN	ddl
1	0db84e3d-ef41-563c- 803e-21c1b985dc19- ddl	None	CREATE TABLE "invoices"\r\n(\r\n InvoiceId	ddl
2	10cba811-ddba-5042- 9e90-d764dfcd1629- ddl	None	CREATE INDEX IFK_InvoiceCustomerId ON "invoice	ddl
3	2c711317-b93d-5f60- a728-cb1c6fcbc040- ddl	None	CREATE INDEX IFK_CustomerSupportRepId ON "cust	ddl
4	37319c81-65f7-50ee- 956b-795de244bee5- ddl	None	CREATE TABLE sqlite_stat1(tbl,idx,stat)	ddl
5	40bd77cd-e1de- 5872-8693- 624117ff413c-ddl	None	CREATE INDEX IFK_InvoiceLineInvoiceId ON "invo	ddl
6	41130543-7164-562a- 90a7-0fd0a409c154- ddl	None	CREATE TABLE "albums"\r\n(\r\n AlbumId INTE	ddl
7	458debc8-8082-5450- a17a-66028bd55ace- ddl	None	CREATE TABLE "playlists"\r\n(\r\n PlaylistI	ddl
8	4815f3fd-925b-53ce- 9dfa-0e4285d5abd3- ddl	None	CREATE TABLE "invoice_items"\r\n(\r\n Invoi	ddl
9	48d484e9-984c-58ff- b391-75521c69d486- ddl	None	CREATE INDEX IFK_PlaylistTrackTrackId ON "play	ddl
10	551e1120-a6ee-554f- 8b8a-ccf4f22d3636- ddl	None	CREATE INDEX IFK_AlbumArtistId ON "albums" (Ar	ddl
11	5ff4911e-45c1-5a59- 9566-243a9b6a3320- ddl	None	CREATE TABLE "employees"\r\n(\r\n EmployeeI	ddl
12	65df0648-bf05-5f75- 9365-c21f54b2302d- ddl	None	CREATE TABLE "media_types"\r\n(\r\n MediaTy	ddl
13	6b585176-e66d- 5b23-8d86- ca8a80e3af3d-ddl	None	CREATE INDEX IFK_EmployeeReportsTo ON "employe	ddl
14	868758b8-e018- 55e7-8cc3- 75c0e6d211c8-ddl	None	CREATE INDEX IFK_TrackAlbumId ON "tracks" (Alb	ddl
15	9ea4613d-c1be-5a77- ada9-c54ee3f0cab7- ddl	None	CREATE INDEX IFK_TrackMediaTypeId ON "tracks"	ddl

	id	question	content	training_data_type
16	a9c9a852-608d-5ef2- aede-26ba098d83d1- ddl	None	CREATE INDEX IFK_TrackGenreId ON "tracks" (Gen	ddl
17	b42cc9e1-9219-5a42- 9a06-de906f76239e- ddl	None	CREATE TABLE "tracks"\r\n(\r\n TrackId INTE	ddl
18	c387b9d2-5ff4-5a07- 8364-f5dab45bb2a9- ddl	None	CREATE TABLE "genres"\r\n(\r\n GenreId INTE	ddl
19	d654f328-dc36-549e- 84c3-06ee0db7e0f7- ddl	None	CREATE TABLE "playlist_track"\r\n(\r\n Play	ddl
20	d93f0d68-023d-5afb- 8121-ba346699d318- ddl	None	CREATE TABLE "customers"\r\n(\r\n CustomerI	ddl
21	e5879308-329e-543f- a693-0c14e2f9972e- ddl	None	CREATE INDEX IFK_InvoiceLineTrackId ON "invoic	ddl
22	ea84418b-1a28-59b4- a1f4-2fb674208adc- ddl	None	CREATE TABLE sqlite_sequence(name,seq)	ddl
0	2b4dda0a-a6ac-5e34- 8f76-e41c0734d55e- doc	None	In the chinook database invoice means order	documentation
1	ece10d36-9223-5045- 9ac8-4b5bc090acb5- doc	None	\n In the 'customers' table, address column	documentation

Asking the Al

Whenever you ask a new question, it will find the 10 most relevant pieces of training data and use it as part of the LLM prompt to generate the SQL.

```
In [13]: ts_start = time()

SELECT name FROM sqlite_master WHERE type = 'table';
SELECT c.CustomerId, SUM(il.Quantity) AS TotalAlbums
FROM Customers c
    JOIN invoices i ON c.CustomerId = i.CustomerId
    JOIN invoice_items il ON i.InvoiceId = il.InvoiceId
    GROUP BY c.CustomerId
    ORDER BY TotalAlbums DESC
LIMIT 5

In [14]: questions = [
    "Can you list all tables in the SQLite database catalog?",
    "which table stores customer's orders",
    "How many customers are there",
    "what are the top 5 countries that customers come from?",
```

```
"List all albums and their corresponding artist names \,\,\, ",
    """Find all tracks with a name containing "What" (case-insensitive) """
    "Get the total number of invoices for each customer",
    "Find the total number of invoices per country",
    "List all invoices with a total exceeding $10",
    "Find all invoices since 2010 and the total amount invoiced:",
    "List all employees and their reporting manager's name (if any):",
    " Get the average invoice total for each customer:",
    "Find the top 5 most expensive tracks (based on unit price):",
    "List all genres and the number of tracks in each genre:",
    "Get all genres that do not have any tracks associated with them:",
    "List all customers who have not placed any orders:",
        Can you find the top 10 most popular artists based on the number of
        Hint: There are 3 tables - artists, albums and tracks,
        where albums and artists are linked by ArtistId, albums and tracks a
    "List all customers from Canada and their email addresses:",
    "Find the customer with the most invoices ",
    "Find the customer who bought the most albums in total quantity (across
        Find the top 5 customers who bought the most albums in total quantit
        Hint: album quantity is found in invoice items,
    0.00
         Find the top 5 customers who spent the most money overall,
         Hint: order total can be found on invoices table, calculation using
    "Get all playlists containing at least 10 tracks and the total duration
    "Identify artists who have albums with tracks appearing in multiple gen
]
```

Loop over questions

```
In [15]: for n, question in enumerate(questions):
    # if n != 4: continue

# if n > 5: continue

my_vn_ask(question=question, sql_id=n+2, allow_llm_to_see_data=allow_llm
```

Number of requested results 10 is greater than number of elements in index 2, updating $n_results = 2$

====

QUESTION - 2: Can you list all tables in the SQLite database catalog?

====

[(SQL Prompt)]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE sqlite stat1(tbl,idx,stat)\n\nCREATE TABLE s qlite sequence(name,seq)\n\nCREATE TABLE "playlists"\r\n(\r\n INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name $NVARCHAR(120)\r\n)\n$ \nCREATE TABLE "genres"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMEN Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE "tracks" $\r\n(\r\n$ T NOT NULL,\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(20 0) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NUL GenreId INTEGER.\r\n Composer NVARCHAR(220),\r\n s INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) N FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t OT NULL,\r\n ON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERE NCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "media types"\r\n MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n $NVARCHAR(120)\r\n)\nCREATE TABLE "artists"\r\n(\r\n$ ArtistId INTEGER PR IMARY KEY AUTOINCREMENT NOT NULL,\r\n Name $NVARCHAR(120)\r\n)\n\nCREATE T$ ABLE "invoice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCRE MENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER N UnitPrice NUMERIC(10.2) NOT NULL.\r\n OT NULL,\r\n Quantity INTEGER FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) NOT NULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE TABLE "playlist track"\r\n(\r\n PlaylistId INTEGER N OT NULL,\r\n TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrac k PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERE NCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DEL ETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(16 0) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistI d) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\n\n In the \'customers\' table, address column names do not have \'Billing\' prefix, \n e.g. country colu mn name is \'country\', not \'BillingCountry\'\n \n\nIn the chinook datab ase invoice means order\n\n===Response Guidelines \n1. If the provided conte xt is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requ ires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strings in that column. Prepe nd the query with a comment saying intermediate sql \n3. If the provided con text is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n 5. If the question has been asked and answ ered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database

catalog?'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[(Prompt Content)]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE sglite stat1(tbl,idx,stat)\n\nCREATE TABLE s glite sequence(name,seq)\n\nCREATE TABLE \"playlists\"\r\n(\r\n d INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n$) GenreId INTEGER PRIMARY KEY AUTOINCR \n\nCREATE TABLE \"genres\"\r\n(\r\n EMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE \"tracks\"\r $\n(\r\n$ TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n VARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER GenreId INTEGER.\r\n Composer NVARCHAR(220),\r\n UnitPrice NUMERIC(1 iseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) 0,2) NOT NULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreI d) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (MediaTypeId) REFERENCES \"media types\" (MediaTy peId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"media types\"\r\n(\r\n MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NO T NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE \"artists\"\ $\r\n$ (\ $\r\n$) ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(12 InvoiceLineId INTEGER 0)\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invo Quantity INTEGER NOT NULL,\r\n ices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n OREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO AC TION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlist track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n RAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n Y (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO AC TION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES \"tracks\" $(TrackId) \r\n\t\0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TAB$ LE \"albums\"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NUL $L,\r\n$ FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\t0 $L,\r\n$ N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\n In the 'customers' table, address column names do not have 'Billing' p e.g. country column name is 'country', not 'BillingCountry'\n refix, \n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n 1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is a lmost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strin gs in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it w as given before. \n"}, {"role": "user", "content": "Can you list all tables

in the SQLite database catalog?"}]

```
[( Ollama Response )]
```

{'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:26:25.633170889Z', 'me ssage': {'role': 'assistant', 'content': "The provided context does not incl ude a way to list all tables in an SQLite database catalog through a SQL que ry on the given table structure. However, typically in SQLite, one could use the following query to achieve this:\n\n```sql\nSELECT name FROM sqlite_mast er WHERE type = 'table';\n``` \n\nSince the above is standard SQLite practic e and not specific to the schema provided, here's how you would list all tab les relevant to the schema shown if you wanted only those:\n\n``sql\nSELECT name FROM sqlite master WHERE type = 'table' AND name IN ('playlists', 'genr es', 'tracks', 'media_types', 'artists', 'invoice_items', 'playlist_track', 'albums');\n```\n\nBut generally, for listing all tables in an SQLite databa se given the context you've provided about specific tables and their structu re, we rely on standard SQLite practices rather than custom SQL based on you r schema. \n\nIf you want to list ALL available tables as per typical SQLite practice, stick with the first query I mentioned."}, 'done reason': 'stop', 'done': True, 'total duration': 154789623743, 'load duration': 8828851120, 'prompt eval count': 803, 'prompt eval duration': 76602234000, 'eval count': 203, 'eval duration': 69245091000}

[(LLM Response)]

The provided context does not include a way to list all tables in an SQLite database catalog through a SQL query on the given table structure. However, typically in SQLite, one could use the following query to achieve this:

```
```sql
SELECT name FROM sqlite_master WHERE type = 'table';
```

Since the above is standard SQLite practice and not specific to the schema p rovided, here's how you would list all tables relevant to the schema shown i f you wanted only those:

```
```sql
SELECT name FROM sqlite_master WHERE type = 'table' AND name IN ('playlist
s', 'genres', 'tracks', 'media_types', 'artists', 'invoice_items', 'playlist
_track', 'albums');
```

But generally, for listing all tables in an SQLite database given the contex t you've provided about specific tables and their structure, we rely on stan dard SQLite practices rather than custom SQL based on your schema.

If you want to list ALL available tables as per typical SQLite practice, stick with the first query I mentioned.

```
[( Output from LLM )]
```

The provided context does not include a way to list all tables in an SQLite database catalog through a SQL query on the given table structure. However, typically in SQLite, one could use the following query to achieve this:

```
```sql
SELECT name FROM sqlite_master WHERE type = 'table';
```
```

Since the above is standard SQLite practice and not specific to the schema p rovided, here's how you would list all tables relevant to the schema shown i f you wanted only those:

```
```sql
SELECT name FROM sqlite_master WHERE type = 'table' AND name IN ('playlist
s', 'genres', 'tracks', 'media_types', 'artists', 'invoice_items', 'playlist
_track', 'albums');
```

But generally, for listing all tables in an SQLite database given the contex t you've provided about specific tables and their structure, we rely on stan dard SQLite practices rather than custom SQL based on your schema.

If you want to list ALL available tables as per typical SQLite practice, stick with the first query I mentioned.

[( Extracted SQL )]

SELECT name FROM sqlite master WHERE type = 'table'

[( SQL )]

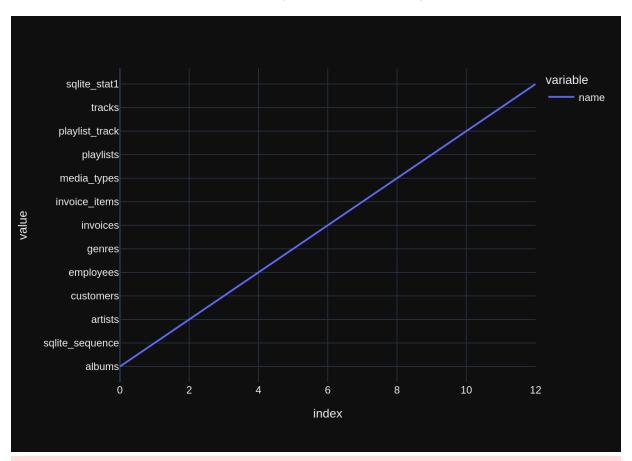
generated SQL statement

**SELECT** name **FROM** sqlite\_master **WHERE** type = 'table'

[( DATA )]
queried data frame

	name
0	albums
1	sqlite_sequence
2	artists
3	customers
4	employees
5	genres
6	invoices
7	invoice_items
8	media_types
9	playlists
10	playlist_track
11	tracks
12	sqlite_stat1

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
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 tains the results of the query that answers the question the user asked: 'Ca
 n you list all tables in the SQLite database catalog?'\n\nThe DataFrame was
 produced using this query: SELECT name FROM sqlite master WHERE type = 'tabl
 e'\n\nThe following is information about the resulting pandas DataFrame 'd
 f': \nRunning df.dtypes gives:\n name
 object\ndtype: object"}, {"role":
 "user", "content": "Can you generate the Python plotly code to chart the res
 ults of the dataframe? Assume the data is in a pandas dataframe called 'df'.
 If there is only one value in the dataframe, use an Indicator. Respond with
only Python code. Do not answer with any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'gwen2.5:14b', 'created at': '2024-10-12T23:26:52.307248031Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\nim
 port plotly.io as pio\n\nfig = go.Figure(go.Indicator(mode="indicator", valu
 e=len(df), title={"text": "Number of Tables"}}))\nfig.show()'}, 'done reaso
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 051190, 'prompt eval count': 150, 'prompt eval duration': 12348252000, 'eval
 count': 46, 'eval duration': 14170242000}
 [(PYTHON)]
generated Plotly code
import plotly.graph_objs as go
import plotly.io as pio
fig = go.Figure(go.Indicator(mode="indicator", value=len(df), title={"text": "Number of Table
s"}}))
```



Number of requested results 10 is greater than number of elements in index 1, updating n\_results = 1 Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

\_\_\_\_\_\_

====

# QUESTION - 3: which table stores customer's orders

\_\_\_\_\_

====

[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE InvoiceLineId INTEGER PRIMARY KEY AUTOINCR TABLE "invoice items"\r\n(\r\n EMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n  $NVARCHAR(70), \ r\ n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n untry NVARCHAR(40),\r\n Phone NVARCHAR(2 Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n portRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT N OT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(2 0) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n rthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n State NVARCHAR(40),\r\n City NVARCHAR(40),\r\n Country NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE TABLE "playlists"\r PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n e NVARCHAR(120)\r\n)\n\nCREATE TABLE sqlite stat1(tbl,idx,stat)\n\nCREATE TA AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL BLE "albums"\r\n(\r\n  $L,\r\n$ Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NUL FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON  $L,\r\n$ DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlist track"\r PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\t0N DELE TE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "t racks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCRE ATE TABLE "media types"\r\n(\r\n MediaTypeId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n===Additional Context \n$ \nIn the chinook database invoice means order\n\n\n In the \'customers\' table, address column names do not have \'Billing\' prefix, \n

ry column name is \'country\', not \'BillingCountry\'\n \n\n===Response G uidelines \n1. If the provided context is sufficient, please generate a vali d SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the d istinct strings in that column. Prepend the query with a comment saying inte rmediate\_sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'\}, \{'role': 'user', 'content': 'Can you l ist all tables in the SQLite database catalog?'\}, \{'role': 'assistant', 'content': "SELECT name FROM sqlite\_master WHERE type = 'table'"\}, \{'role': 'user', 'content': "which table stores customer's orders"\}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

#### [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingState NVARCHAR(40),\r\n illingCity NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER FOREIGN KEY (CustomerId) REFERENCES \"customers\" IC(10,2) NOT NULL,\r\n (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOIN CREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n City NVARCHAR(40),\r\n ddress NVARCHAR(70),\r\n State NVARCHAR(40),\r Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n  $RCHAR(24), \r\n$ SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employe es\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCR EATE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCR LastName NVARCHAR(20) NOT NULL,\r\n EMENT NOT NULL,\r\n FirstName NVA RCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r BirthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NV (70), r n $ARCHAR(40), \r\n$ PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) Fax NVARCHAR(24),\r\n REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE TABLE \"p PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL laylists\"\r\n(\r\n Name NVARCHAR(120)\r\n)\n\nCREATE TABLE sglite stat1(tbl,idx,stat) \n\nCREATE TABLE \"albums\"\r\n(\r\n Albumid INTEGER PRIMARY KEY AUTOINCR

EMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGE R NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playl PlaylistId INTEGER NOT NULL,\r\n ist track\"\r\n(\r\n TrackId INTEGER CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, Track NOT NULL,\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"media types\"\r\n(\r\n MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\n===A$ dditional Context \n\nIn the chinook database invoice means order\n\n n the 'customers' table, address column names do not have 'Billing' prefix, e.g. country column name is 'country', not 'BillingCountry'\n ==Response Guidelines \n1. If the provided context is sufficient, please gen erate a valid SQL query without any explanations for the question. \n2. If t he provided context is almost sufficient but requires knowledge of a specifi c string in a particular column, please generate an intermediate SQL query t o find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use the most relevant table (s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "Can you list all tables in the SQLite database catalog?"}, {"role": "assist ant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"r ole": "user", "content": "which table stores customer's orders"}]

Number of requested results 10 is greater than number of elements in index 1, updating n results =1

Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

```
[(Ollama Response)]
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'done': True, 'total_duration': 110964951563, 'load_duration': 10426672, 'pr
ompt_eval_count': 1041, 'prompt_eval_duration': 110403260000, 'eval_count':
2, 'eval_duration': 337457000}
[(LLM Response)]
invoices
*** RETRY 1 ***
```

#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER UnitPrice NUMERIC(10.2) NOT NULL.\r\n NOT NULL,\r\n Ouantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE INDEX IFK Invo iceLineInvoiceId ON "invoice items" (InvoiceId)\n\nCREATE TABLE "artists"\r ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (Cust omerId)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY K FirstName NVARCHAR(40) NOT NULL,\r\n EY AUTOINCREMENT NOT NULL,\r\n astName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n  $NVARCHAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n untry NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(2 4),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n portRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId)  $\r \n \t \0$  DELETE NO ACTION ON UPDATE NO ACTION $\r \n \n \$ TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT N LastName NVARCHAR(20) NOT NULL,\r\n OT NULL,\r\n FirstName NVARCHAR(2 0) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n rthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r Phone NVARCHAR(24),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHA \n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY A UTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE "genre GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $s"\r\n(\r\n$ me  $NVARCHAR(120)\r\n)\n\n===Additional Context \n\n\n$ In the \'customer s\' table, address column names do not have \'Billing\' prefix, \n ountry column name is \'country\', not \'BillingCountry\'\n \n\nIn the ch inook database invoice means order\n\n===Response Guidelines \n1. If the pro vided context is sufficient, please generate a valid SQL query without any e

xplanations for the question. \n2. If the provided context is almost suffici
ent but requires knowledge of a specific string in a particular column, plea
se generate an intermediate SQL query to find the distinct strings in that c
olumn. Prepend the query with a comment saying intermediate\_sql \n3. If the
provided context is insufficient, please explain why it can\'t be generated.
\n4. Please use the most relevant table(s). \n5. If the question has been as
ked and answered before, please repeat the answer exactly as it was given be
fore. \n'\}, {'role': 'user', 'content': 'Can you list all tables in the SQLi
te database catalog?'\}, {'role': 'assistant', 'content': "SELECT name FROM s
qlite\_master WHERE type = 'table'"\}, {'role': 'user', 'content': "\n
For the question which table stores customer's orders, \n the generat
ed SQL statement invoices results in the following exception [ERROR-SQL] the
generated SQL: invoices\n does not starts with ('select', 'with') .\n
Please fix the error and re-generate the SQL\n "\}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillinaCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOIN CREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE INDEX IFK In voiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"artist ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $s\''\r\n(\r\n$ Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices \" (CustomerId)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NUL LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n  $L,\r\n$ Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Country NVARCHAR(40),\r\n Phone NVA  $RCHAR(24), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employe es\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCR EATE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVA RCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r BirthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR (70), r nCity NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NV  $ARCHAR(40), \r\n$ PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo)

REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlists\"\r\n(\r\n PlaylistId INTEGER Name NVARCHAR(120) $\r\n)\n\n$ CREATE PRIMARY KEY AUTOINCREMENT NOT NULL.\r\n TABLE \"genres\"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT N Name NVARCHAR(120) $\r\n\n\n===Additional Context \n\n\n$ the 'customers' table, address column names do not have 'Billing' prefix, \n e.g. country column name is 'country', not 'BillingCountry'\n chinook database invoice means order\n\n===Response Guidelines \n1. If the p rovided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is almost suffic ient but requires knowledge of a specific string in a particular column, ple ase generate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been as ked and answered before, please repeat the answer exactly as it was given be fore. \n"}, {"role": "user", "content": "Can you list all tables in the SQLi te database catalog?"}, {"role": "assistant", "content": "SELECT name FROM s qlite master WHERE type = 'table'"}, {"role": "user", "content": "\n For the question which table stores customer's orders, \n ed SQL statement invoices results in the following exception [ERROR-SQL] the generated SQL : invoices\n does not starts with ('select','with') .\n Please fix the error and re-generate the SQL\n "}]

```
[(Ollama Response)]
{'model': 'qwen2.5:14b', 'created_at': '2024-10-12T23:30:01.872177581Z', 'me
ssage': {'role': 'assistant', 'content': 'SELECT * FROM invoices'}, 'done_re
ason': 'stop', 'done': True, 'total_duration': 78071228182, 'load_duration':
13194148, 'prompt_eval_count': 982, 'prompt_eval_duration': 76424364000, 'ev
al_count': 5, 'eval_duration': 1386316000}
[(LLM Response)]
SELECT * FROM invoices

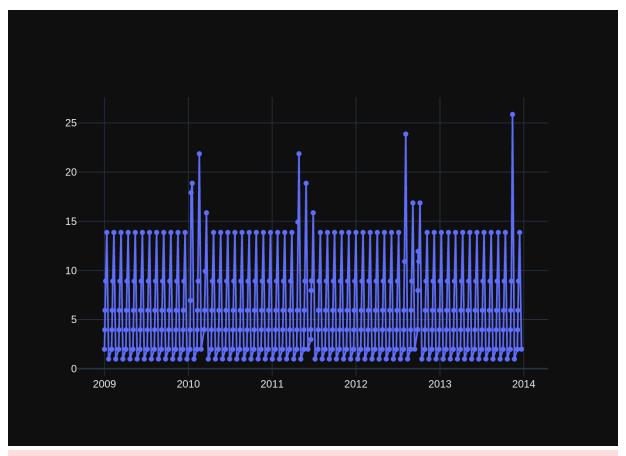
[(SQL)]
generated SQL statement
SELECT * FROM invoices

[(DATA)]
queried data frame
```

	InvoiceId	CustomerId	InvoiceDate	BillingAddress	BillingCity	BillingState	BillingCou
0	1	2	2009-01-01 00:00:00	Theodor- Heuss-Straße 34	Stuttgart	None	Geri
1	2	4	2009-01-02 00:00:00	Ullevålsveien 14	Oslo	None	No
2	3	8	2009-01-03 00:00:00	Grétrystraat 63	Brussels	None	Bel
3	4	14	2009-01-06 00:00:00	8210 111 ST NW	Edmonton	AB	Ca
4	5	23	2009-01-11 00:00:00	69 Salem Street	Boston	MA	
•••	•••	•••	•••	•••	•••	•••	
407	408	25	2013-12-05 00:00:00	319 N. Frances Street	Madison	WI	
408	409	29	2013-12-06 00:00:00	796 Dundas Street West	Toronto	ON	Ca
409	410	35	2013-12-09 00:00:00	Rua dos Campeões Europeus de Viena, 4350	Porto	None	Рог
410	411	44	2013-12-14 00:00:00	Porthaninkatu 9	Helsinki	None	Fir
411	412	58	2013-12-22 00:00:00	12,Community Centre	Delhi	None	
412 rows × 9 columns							

file:///home/gongai/Downloads/ollama-qwen2.5-14b-chromadb-sqlite-test-3.html

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: '\n
 For the question which table stores customer's orders, \n
ed SQL statement invoices results in the following exception [ERROR-SQL] the
 generated SQL : invoices\n does not starts with ('select','with') .\n
 Please fix the error and re-generate the SQL\n
 '\n\nThe DataFrame was
 produced using this query: SELECT * FROM invoices\n\nThe following is inform
 ation about the resulting pandas DataFrame 'df': \nRunning df.dtypes give
 s:\n InvoiceId
 int64\nCustomerId
 int64\nInvoiceDate
object\nBillingAddress
 object\nBillingCity
 object\nBillingS
 object\nBillingPostalCode
tate
 object\nBillingCountry
 ject\nTotal
 float64\ndtype: object"}, {"role": "user", "conte
 nt": "Can you generate the Python plotly code to chart the results of the da
 taframe? Assume the data is in a pandas dataframe called 'df'. If there is o
 nly one value in the dataframe, use an Indicator. Respond with only Python c
ode. Do not answer with any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:30:46.317162451Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\n\n
 fig = go.Figure(go.Indicator(mode="number", value=df
 if len(df) == 1:\n
 [\'Total\'].iloc[0]))\nelse:\n
 fig = go.Figure()\n
 fig.add trace(go.Sc
 atter(x=df[\'InvoiceDate\'], y=df[\'Total\'], mode=\'lines+markers\'))\n
 \nfig.show()'}, 'done_reason': 'stop', 'done': True, 'total_duration': 44418
 196349, 'load duration': 10788904, 'prompt eval count': 237, 'prompt eval du
 ration': 20365817000, 'eval count': 76, 'eval duration': 23953012000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['Total'].iloc[0]))
else:
 fig = go.Figure()
 fig.add trace(go.Scatter(x=df['InvoiceDate'], y=df['Total'], mode='lines+markers'))
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

\_\_\_\_\_\_

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# QUESTION - 4: How many customers are there

\_\_\_\_\_

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#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n
BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON "customers" (SupportRepId)\n\nCREATE TABLE FirstName NVARCHAR(40) NOT NULL,\r\n  $L,\r\n$ LastName NVARCHAR(20) NO T NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n y  $NVARCHAR(40), \r\n$ State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER.\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerI d ON "invoices" (CustomerId)\n\nCREATE TABLE "invoice items"\r\n(\r\n oiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTE GER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(1 Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (Invoi 0,2) NOT NULL,\r\n ceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDAT E NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK Invoice LineInvoiceId ON "invoice items" (InvoiceId)\n\nCREATE TABLE "albums"\r\n(\r AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARC HAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (A rtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDA TE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n irstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo BirthDate DATETIME,\r\n HireDate DATETIME,\r\n INTEGER,\r\n City NVARCHAR(40),\r\n  $NVARCHAR(70), \r\n$ State NVARCHAR(40),\r\n untry NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(2 4),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlists"\r\n(\r\n INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n$ \n\n===Additional Context \n\n\n In the \'customers\' table, address colu mn names do not have \'Billing\' prefix, \n e.g. country column name is \'country\', not \'BillingCountry\'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n1. If the provided context is suffic ient, please generate a valid SQL query without any explanations for the que stion. \n2. If the provided context is almost sufficient but requires knowle dge of a specific string in a particular column, please generate an intermed

iate SQL query to find the distinct strings in that column. Prepend the quer y with a comment saying intermediate sql \n3. If the provided context is ins ufficient, please explain why it can\'t be generated. \n4. Please use the mo st relevant table(s). \n5. If the question has been asked and answered befor e, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': "\n For the question which table stores customer's the generated SQL statement invoices results in the follow orders, \n ing exception [ERROR-SQL] the generated SQL : invoices\n does not starts wit Please fix the error and re-generate the SQL h ('select','with') .\n "}, {'role': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'How many customers are there'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

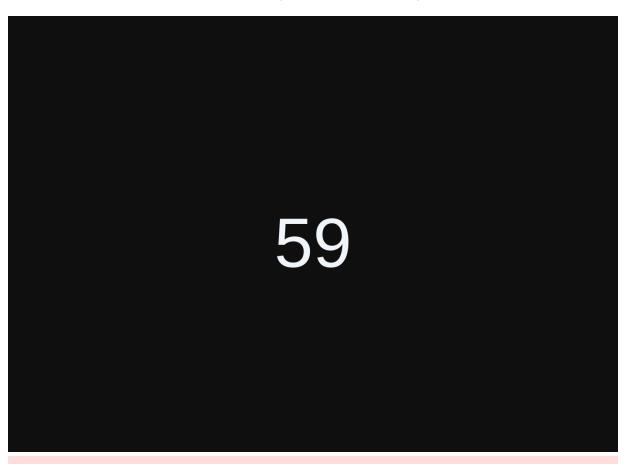
[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou BillingPostalCode NVARCHAR(10),\r\n ntry NVARCHAR(40),\r\n IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (SupportRepId)\n\nCREATE TAB LE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NO T NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(2 0) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r Phone NVARCHAR(24),\r\n PostalCode NVARCHAR(10),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n R(24), r nFOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustome rId ON \"invoices\" (CustomerId)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId I NTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC Quantity INTEGER NOT NULL,\r\n (10,2) NOT NULL,\r\n FOREIGN KEY (Inv oiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON U FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackI PDATE NO ACTION,\r\n d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"albu AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $ms\"\r\n(\r\n$ Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n EIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\t0N DELETE NO A CTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"i nvoice items\" (TrackId)\n\nCREATE TABLE \"employees\"\r\n(\r\n d INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(3 0),\r\n ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n HireDate DAT

Address NVARCHAR(70),\r\n ETIME,\r\n City NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r  $VARCHAR(40), \r\n$ Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(6 \n FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (EmployeeId) \r 0), r n\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlis  $ts\"\r\n(\r\n$ PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\n===Additional Context  $\n\n$ rs' table, address column names do not have 'Billing' prefix, \n e.a. cou ntry column name is 'country', not 'BillingCountry'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explana tions for the question. \n2. If the provided context is almost sufficient bu t requires knowledge of a specific string in a particular column, please gen erate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provide d context is insufficient, please explain why it can't be generated. \n4. Pl ease use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "\n For the question which table st ores customer's orders, \n the generated SQL statement invoices resul ts in the following exception [ERROR-SQL] the generated SQL : invoices\n doe s not starts with ('select','with') .\n Please fix the error and re-q "}, {"role": "assistant", "content": "SELECT \* FROM enerate the SQL\n invoices"}, {"role": "user", "content": "Can you list all tables in the SQLi te database catalog?"}, {"role": "assistant", "content": "SELECT name FROM s qlite master WHERE type = 'table'"}, {"role": "user", "content": "How many c ustomers are there"}] [( Ollama Response )] {'model': 'qwen2.5:14b', 'created\_at': '2024-10-12T23:32:38.85378886Z', 'mes sage': {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, 'done reason': 'stop', 'done': True, 'total duration': 112422902035, 'load d uration': 12851872, 'prompt eval count': 1039, 'prompt eval duration': 11032 5709000, 'eval count': 6, 'eval duration': 1731025000} [( LLM Response )] SELECT COUNT(\*) FROM customers [( SQL )] generated SQL statement **SELECT COUNT(\*) FROM** customers [( DATA )] queried data frame COUNT(\*)

59

0

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Ho
w many customers are there'\n\nThe DataFrame was produced using this query:
 SELECT COUNT(*) FROM customers\n\nThe following is information about the res
ulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n COUNT(*)
 \ndtype: object"}, {"role": "user", "content": "Can you generate the Python
 plotly code to chart the results of the dataframe? Assume the data is in a p
 andas dataframe called 'df'. If there is only one value in the dataframe, us
e an Indicator. Respond with only Python code. Do not answer with any explan
 ations -- just the code."}]
 [(Ollama Response)]
 {'model': 'gwen2.5:14b', 'created at': '2024-10-12T23:33:01.191124008Z', 'me
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 \n\nfig = go.Figure(go.Indicator(mode="number", value=df[\'COUNT(*)\'].iloc
 [0]))\nfig.show()'}, 'done reason': 'stop', 'done': True, 'total duration':
 22306016918, 'load_duration': 13581611, 'prompt_eval_count': 143, 'prompt_ev
 al duration': 11927786000, 'eval count': 34, 'eval duration': 10314918000}
 [(PYTHON)]
generated Plotly code
import plotly.graph objects as go
fig = go.Figure(go.Indicator(mode="number", value=df['COUNT(*)'].iloc[0]))
```



Number of requested results 10 is greater than number of elements in index 3, updating  $n_results = 3$ 

Number of requested results 10 is greater than number of elements in index 2, updating n\_results = 2

\_\_\_\_\_\_

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# QUESTION - 5: what are the top 5 countries that customers come from?

\_\_\_\_\_

[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT N OT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(2 0) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r Phone NVARCHAR(24),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHA Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice items"\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n voiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPric e NUMERIC(10,2) NOT  $NULL,\r\n$  Quantity INTEGER NOT  $NULL,\r\n$ KEY (InvoiceId) REFERENCES "invoices" (InvoiceId)  $\r \n \$  DELETE NO ACTIO N ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (Tra ckid) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "media types"\r\n(\r\n MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NOT Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK CustomerSupportRepI d ON "customers" (SupportRepId)\n\nCREATE TABLE "employees"\r\n(\r\n oyeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR FirstName NVARCHAR(20) NOT NULL,\r\n (20) NOT NULL,\r\n Title NVARCH  $AR(30), \r\n$ ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n e NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(1 Phone NVARCHAR(24),\r\n Fax  $NVARCHAR(24), \r\n$ 0), r nEmail NVARCHA FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r  $R(60), \r\n$ \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "album AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $s"\r\n(\r\n$ Τi tle NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREI GN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTIO N ON UPDATE NO ACTION\r\n)\n\CREATE TABLE "playlist track"\r\n(\r\n listId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n T PK\_PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (P laylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION O FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackI N UPDATE NO ACTION,\r\n d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE sqli te sequence(name, seq)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n R, r n

Bvtes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (Albumid) REFERENCES "albums" (Albumid) \r\n\t\tON DELETE NO ACTION ON UPDAT E NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\n===Additional Context \n\n\n In the \'customers\' table, address column names do not have \'Billing\' prefix, \n ry column name is \'country\', not \'BillingCountry\'\n \n\nIn the chinoo k database invoice means order $\n==$ Response Guidelines  $\n1$ . If the provide d context is sufficient, please generate a valid SQL query without any expla nations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please q enerate an intermediate SQL query to find the distinct strings in that colum n. Prepend the query with a comment saying intermediate sql \n3. If the prov ided context is insufficient, please explain why it can\'t be generated. \n 4. Please use the most relevant table(s). \n5. If the question has been aske d and answered before, please repeat the answer exactly as it was given befo re. \n'}, {'role': 'user', 'content': 'How many customers are there'}, {'rol e': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'use r', 'content': "\n For the question which table stores customer's ord the generated SQL statement invoices results in the following ers, \n exception [ERROR-SQL] the generated SQL : invoices\n does not starts with ('select','with') .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'us er', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'what are the top 5 countries that customers come from?'}l

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep\_alive=None

#### [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL.\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE CustomerId INTEGER PRIMARY KEY AUTOINCREMENT TABLE \"customers\"\r\n(\r\n NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR (20) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR PostalCode NVARCHAR(10),\r\n (40), r nPhone NVARCHAR(24),\r\n  $NVARCHAR(24), \ r\ n$ Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEG FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoi InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT N ce items\"\r\n(\r\n ULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NUL \n

FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t \tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFE RENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION  $\r\n)\n\n\CREATE TABLE \"media_types\"\r\n(\r\n$ MediaTypeId INTEGER PRIMAR Y KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (SupportRepId)\n\nCREATE TABLE \"e mployees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL  $L,\r\n$ LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) T NULL, $\r\n$ Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n BirthDat e DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n ty NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"e 4),\r\n mployees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE TABLE \"albums\"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGE R NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playl ist track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, Track FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE TABLE \"trac TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $ks\"\r\n(\r\n$ Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INT EGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (Albu mId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (Ge nreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE FOREIGN KEY (MediaTypeId) REFERENCES \"media types\" (Medi NO ACTION,\r\n aTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n\n===Additi In the 'customers' table, address column names do not onal Context \n\n\n have 'Billing' prefix, \n e.g. country column name is 'country', not 'Bil lingCountry'\n \n\nIn the chinook database invoice means order\n\n===Resp onse Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the pro vided context is almost sufficient but requires knowledge of a specific stri ng in a particular column, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explai n why it can't be generated. \n4. Please use the most relevant table(s). \n 5. If the question has been asked and answered before, please repeat the ans wer exactly as it was given before. \n"}, {"role": "user", "content": "How m any customers are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "\n For the question wh ich table stores customer's orders, \n the generated SQL statement in voices results in the following exception [ERROR-SQL] the generated SQL : in voices\n does not starts with ('select','with') .\n Please fix the er ror and re-generate the SQL\n "}, {"role": "assistant", "content": "S ELECT \* FROM invoices"}, {"role": "user", "content": "Can you list all table s in the SQLite database catalog?"}, {"role": "assistant", "content": "SELEC T name FROM sqlite\_master WHERE type = 'table'"}, {"role": "user", "conten t": "what are the top 5 countries that customers come from?"}]

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[(Ollama Response)]
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CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Customer
Count DESC \nLIMIT 5; \n\nNote: The original table columns do not have 'Bill
ing' prefix for country. Adjusting to correct column name:\n\nSELECT Countr
y, COUNT(*) as CustomerCount \nFROM customers \nGROUP BY Country \nORDER BY
CustomerCount DESC \nLIMIT 5;"}, 'done reason': 'stop', 'done': True, 'total
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[(LLM Response)]
SELECT BillingCountry, COUNT(*) as CustomerCount
FROM customers
GROUP BY BillingCountry
ORDER BY CustomerCount DESC
LIMIT 5:
Note: The original table columns do not have 'Billing' prefix for country. A
djusting to correct column name:
SELECT Country, COUNT(*) as CustomerCount
FROM customers
GROUP BY Country
ORDER BY CustomerCount DESC
LIMIT 5;
[(Output from LLM)]
 SELECT BillingCountry, COUNT(*) as CustomerCount
FROM customers
GROUP BY BillingCountry
ORDER BY CustomerCount DESC
LIMIT 5;
Note: The original table columns do not have 'Billing' prefix for country. A
djusting to correct column name:
SELECT Country, COUNT(*) as CustomerCount
FROM customers
GROUP BY Country
ORDER BY CustomerCount DESC
LIMIT 5:
[(Extracted SQL)]
 SELECT BillingCountry, COUNT(*) as CustomerCount
FROM customers
GROUP BY BillingCountry
ORDER BY CustomerCount DESC
LIMIT 5
[(SQL)]
generated SQL statement
```

**SELECT** BillingCountry, **COUNT(\*) as** CustomerCount

**FROM** customers

**GROUP BY** BillingCountry

ORDER BY CustomerCount DESC

#### LIMIT 5

Number of requested results 10 is greater than number of elements in index 3, updating n\_results = 3

Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

\*\*\* RETRY 1 \*\*\*

[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT N OT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(2 0) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHA Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER.\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARC FirstName NVARCHAR(20) NOT NULL,\r\n HAR(20) NOT NULL,\r\n Title NVA  $RCHAR(30), \r\n$ ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n ate DATETIME.\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n PostalCode NVARCHAR State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n  $(10), \r\n$  $HAR(60), \r\n$ FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE sqlite sequence(name,seq)\n\nCREATE TABLE "invoice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NU  $LL,\r\n$ TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NU LL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERE NCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DEL ETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "artists"\r\n(\r\n ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(12 0)\r\n)\n\nCREATE TABLE "genres"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUT OINCREMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE sqlite s tat1(tbl,idx,stat)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER PRIM ARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES "artist ArtistId INTEGER NOT NULL,\r\n s" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT N OT NULL,\r\n Name NVARCHAR(120)\r\n)\n\n===Additional Context  $\n\n\$ In the \'customers\' table, address column names do not have \'Billing\' pre e.g. country column name is \'country\', not \'BillingCountry\'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n 1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is a lmost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strin gs in that column. Prepend the query with a comment saying intermediate sgl \n3. If the provided context is insufficient, please explain why it can\'t b e generated. \n4. Please use the most relevant table(s). \n5. If the questio n has been asked and answered before, please repeat the answer exactly as it

was given before. \n'}, {'role': 'user', 'content': "\n For the quest ion which table stores customer's orders, \n the generated SQL statem ent invoices results in the following exception [ERROR-SQL] the generated SQ L : invoices\n does not starts with ('select', 'with') .\n "}, {'role': 'assistant', 'conten the error and re-generate the SQL\n t': 'SELECT \* FROM invoices'}, {'role': 'user', 'content': 'How many custome rs are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM custo mers'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite d atabase catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlit e\_master WHERE type = 'table'"}, {'role': 'user', 'content': "\n the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

#### [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR (20) NOT NULL, $\r\n$ Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR \n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n  $(40), \r\n$  $NVARCHAR(24), \r\n$ Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEG FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"emplo EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r  $yees\"\r\n(\r\n$ LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NU \n ReportsTo INTEGER,\r\n  $LL,\r\n$ Title NVARCHAR(30),\r\n BirthDate DA HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n TETIME,\r\n  $VARCHAR(40), \r\n$ State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"e mployees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE TABLE \"invoice items InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPr

ice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n GN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES \"tracks \" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT TABLE \"artists\"\r\n(\r\n NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE TABLE \"genres\"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n 0)\r\n)\n\nCREATE TABLE sqlite stat1(tbl,idx,stat)\n\nCREATE TABLE \"albums Albumid INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n tle NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREI GN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\t0N DELETE NO ACT ION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlists\"\r\n(\r\n istId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120) \r\n)\n\n===Additional Context \n\n\n In the 'customers' table, address e.g. country column name is column names do not have 'Billing' prefix, \n 'country', not 'BillingCountry'\n \n\nIn the chinook database invoice mea ns order\n\n===Response Guidelines \n1. If the provided context is sufficien t, please generate a valid SQL query without any explanations for the questi on. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query wit h a comment saying intermediate sql \n3. If the provided context is insuffic ient, please explain why it can't be generated. \n4. Please use the most rel evant table(s). \n5. If the question has been asked and answered before, ple ase repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "\n For the question which table stores customer's orders, the generated SQL statement invoices results in the following exce ption [ERROR-SQL] the generated SQL : invoices\n does not starts with ('sele Please fix the error and re-generate the SQL\n ct','with') .\n "}, {"role": "assistant", "content": "SELECT \* FROM invoices"}, {"role": "us er", "content": "How many customers are there"}, {"role": "assistant", "cont ent": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "Can yo u list all tables in the SQLite database catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT Bill ingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCou ntry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following except ion [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Cus tomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCou nt DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Custo merCount DESC \nLIMIT 5': no such column: BillingCountry .\n ix the error and re-generate the SQL\n " } ]

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```
[(LLM Response)]
SELECT Country, COUNT(*) AS CustomerCount
FROM customers
```

```
GROUP BY Country
ORDER BY CustomerCount DESC
LIMIT 5

[(SQL)]
generated SQL statement

SELECT Country, COUNT(*) AS CustomerCount
```

**FROM** customers

**GROUP BY** Country

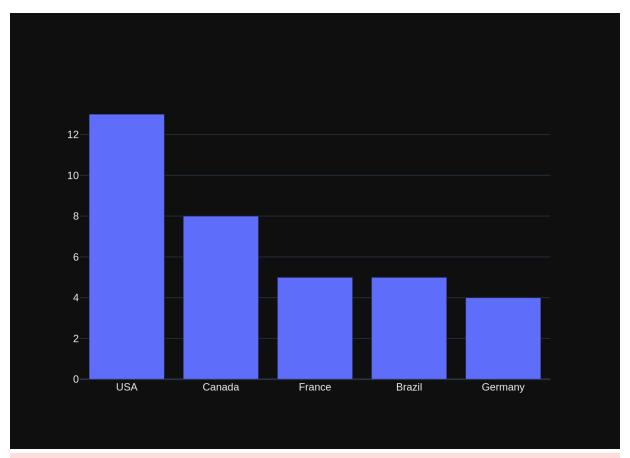
ORDER BY CustomerCount DESC

## LIMIT 5

[( DATA )]
queried data frame

	Country	CustomerCount
0	USA	13
1	Canada	8
2	France	5
3	Brazil	5
4	Germany	4

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: '\n
 For the question what are the top 5 countries that customers come from?, \n
the generated SQL statement SELECT BillingCountry, COUNT(*) as CustomerCount
 \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL
 IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL:
 SELECT BillingCountry, COUNT(*) as CustomerCount \nFROM customers \nGROUP BY
 BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on
 sql 'SELECT BillingCountry, COUNT(*) as CustomerCount \nFROM customers \nGRO
UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum
n: BillingCountry .\n
 Please fix the error and re-generate the SQL\n
 '\n\nThe DataFrame was produced using this query: SELECT Country, COUNT(*) A
 S CustomerCount \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount
DESC \nLIMIT 5\n\nThe following is information about the resulting pandas Da
taFrame 'df': \nRunning df.dtypes gives:\n Country
 object\nCustomer
 int64\ndtype: object"}, {"role": "user", "content": "Can you gener
 ate the Python plotly code to chart the results of the dataframe? Assume the
data is in a pandas dataframe called 'df'. If there is only one value in the
 dataframe, use an Indicator. Respond with only Python code. Do not answer wi
 th any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:38:29.313209138Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph_objs as go\n\n
 if len(df) == 1:\n
 fig = go.Figure(go.Indicator(mode="number", value=df
 [\'CustomerCount\'].iloc[0]))\nelse:\n
 fig = go.Figure([go.Bar(x=df[\'Cou
 ntry\'], y=df[\'CustomerCount\'])])\n
 \nfig.show()'}, 'done reason': 'sto
 p', 'done': True, 'total duration': 48343544924, 'load duration': 11960440,
 'prompt eval count': 307, 'prompt eval duration': 27143639000, 'eval count':
 67, 'eval duration': 21100023000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['CustomerCount'].iloc[0]))
else:
 fig = qo.Figure([go.Bar(x=df['Country'], y=df['CustomerCount'])])
```



Number of requested results 10 is greater than number of elements in index 4, updating n\_results = 4Number of requested results 10 is greater than number of elements in index 2, updating n results = 2 -----

====

# QUESTION - 6: List all albums and their corresponding artist names

\_\_\_\_\_

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## [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)\n\n AlbumId INTEGER PRIMARY KEY AUTOINCREMENT CREATE TABLE "albums"\r\n(\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\t NULL,\r\n ON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\REATE TABLE "tracks"\r\n(\r TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n AR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT N GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n nds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t NOT NULL,\r\n \tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFE RENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaTypeId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackAl bumId ON "tracks" (AlbumId)\n\nCREATE TABLE "artists"\r\n(\r\n NTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n$ \nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n\nCREATE INDEX IFK Pl aylistTrackTrackId ON "playlist track" (TrackId)\n\nCREATE TABLE "playlist  $s"\r\n(\r\n$ PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE "genres" $\r\n(\r\n$ PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\nCREATE$ INDEX IFK TrackMediaTypeId ON "tracks" (MediaTypeId)\n\n===Additional Cont In the \'customers\' table, address column names do not have ext \n\n\n \'Billing\' prefix, \n e.g. country column name is \'country\', not \'Bil lingCountry\'\n \n\nIn the chinook database invoice means order\n\n===Res ponse Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the pro vided context is almost sufficient but requires knowledge of a specific stri ng in a particular column, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate\_sql \n3. If the provided context is insufficient, please explai n why it can\'t be generated. \n4. Please use the most relevant table(s). \n 5. If the question has been asked and answered before, please repeat the ans wer exactly as it was given before. \n'}, {'role': 'user', 'content': 'Can y ou list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'c ontent': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': "\n For the question which table s tores customer's orders, \n the generated SQL statement invoices resu Its in the following exception [ERROR-SQL] the generated SQL : invoices\n do es not starts with ('select','with') .\n Please fix the error and re-"}, {'role': 'assistant', 'content': 'SELECT \* FRO generate the SQL\n M invoices'}, {'role': 'user', 'content': 'List all albums and their corresp onding artist names '}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

## [( Prompt Content )]

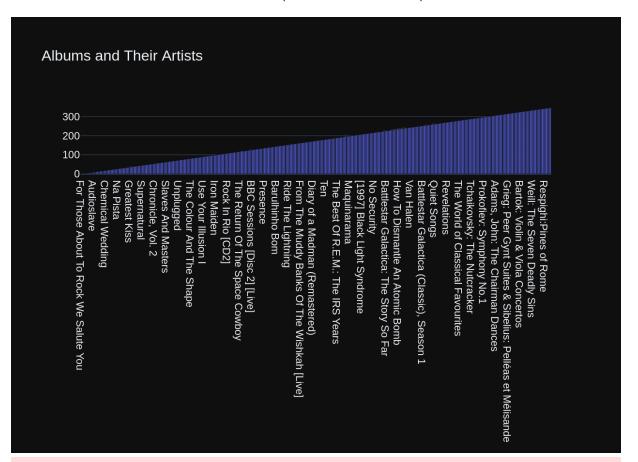
[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK AlbumArtistId ON \"albums\" (ArtistId)\n \nCREATE TABLE \"albums\"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREM Title NVARCHAR(160) NOT NULL,\r\n ENT NOT NULL,\r\n ArtistId INTEGER FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r NOT NULL,\r\n \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"tracks TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n \"\r\n(\r\n me NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEG ER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (Albu mId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (Ge nreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE FOREIGN KEY (MediaTypeId) REFERENCES \"media types\" (Medi NO ACTION,\r\n aTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDE X IFK TrackAlbumId ON \"tracks\" (AlbumId)\n\nCREATE TABLE \"artists\"\r\n ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n ARCHAR(120)\r\n)\n\nCREATE INDEX IFK TrackGenreId ON \"tracks\" (GenreId)\n \nCREATE INDEX IFK\_PlaylistTrackTrackId ON \"playlist track\" (TrackId)\n\nC REATE TABLE \"playlists\"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOINC REMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\nCREATE TABLE \"genres\"\r$ GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n VARCHAR(120)\r\n)\n\nCREATE INDEX IFK TrackMediaTypeId ON \"tracks\" (MediaT ypeId)\n\n===Additional Context \n\n\n In the 'customers' table, addres s column names do not have 'Billing' prefix, \n e.g. country column name is 'country', not 'BillingCountry'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n1. If the provided context is suffic ient, please generate a valid SQL query without any explanations for the que stion. \n2. If the provided context is almost sufficient but requires knowle dge of a specific string in a particular column, please generate an intermed iate SQL query to find the distinct strings in that column. Prepend the quer y with a comment saying intermediate sql \n3. If the provided context is ins ufficient, please explain why it can't be generated. \n4. Please use the mos t relevant table(s). \n5. If the question has been asked and answered befor e, please repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "Can you list all tables in the SQLite database catalo

```
g?"}, {"role": "assistant", "content": "SELECT name FROM sqlite_master WHERE
 type = 'table'"}, {"role": "user", "content": "How many customers are ther
e"}, {"role": "assistant", "content": "SELECT COUNT(*) FROM customers"}, {"r
 ole": "user", "content": "\n
 For the question what are the top 5 coun
tries that customers come from?, \n
 the generated SQL statement SELEC
T BillingCountry, COUNT(*) as CustomerCount \nFROM customers \nGROUP BY Bill
 ingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following
 exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(*)
 as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Custo
merCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, CO
UNT(*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER B
Y CustomerCount DESC \nLIMIT 5': no such column: BillingCountry .\n
lease fix the error and re-generate the SOL\n
 "}, {"role": "assistan
 t", "content": "SELECT Country, COUNT(*) AS CustomerCount \nFROM customers
 \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "use
 r", "content": "\n
 For the question which table stores customer's ord
ers, \n
 the generated SQL statement invoices results in the following
 exception [ERROR-SQL] the generated SQL : invoices\n does not starts with
 ('select','with') .\n
 Please fix the error and re-generate the SQL\n
 "}, {"role": "assistant", "content": "SELECT * FROM invoices"}, {"role": "us
 er", "content": "List all albums and their corresponding artist names "}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:40:19.308507312Z', 'me
 ssage': {'role': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.N
 ame AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.Artis
 tId;'}, 'done reason': 'stop', 'done': True, 'total duration': 109906114810,
 'load duration': 12867555, 'prompt eval count': 937, 'prompt eval duration':
 98572026000, 'eval count': 32, 'eval duration': 10619813000}
 [(LLM Response)]
 SELECT a. Title AS AlbumTitle, ar. Name AS ArtistName
 FROM albums a
JOIN artists ar ON a.ArtistId = ar.ArtistId;
 [(Output from LLM)]
 SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName
 FROM albums a
JOIN artists ar ON a.ArtistId = ar.ArtistId;
 [(Extracted SQL)]
 SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName
 FROM albums a
 JOIN artists ar ON a.ArtistId = ar.ArtistId
 [(SQL)]
 generated SQL statement
SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName
FROM albums a
JOIN artists ar ON a.ArtistId = ar.ArtistId
 [(DATA)]
 queried data frame
```

	AlbumTitle	ArtistName
0	For Those About To Rock We Salute You	AC/DC
1	Balls to the Wall	Accept
2	Restless and Wild	Accept
3	Let There Be Rock	AC/DC
4	Big Ones	Aerosmith
•••		
342	Respighi:Pines of Rome	Eugene Ormandy
343	Schubert: The Late String Quartets & String Qu	Emerson String Quartet
344	Monteverdi: L'Orfeo	C. Monteverdi, Nigel Rogers - Chiaroscuro; Lon
345	Mozart: Chamber Music	Nash Ensemble
346	Koyaanisqatsi (Soundtrack from the Motion Pict	Philip Glass Ensemble

347 rows × 2 columns

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Li
 st all albums and their corresponding artist names '\n\nThe DataFrame was p
 roduced using this guery: SELECT a.Title AS AlbumTitle, ar.Name AS ArtistNam
 e \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId\n\nThe follo
wing is information about the resulting pandas DataFrame 'df': \nRunning df.
dtypes gives:\n AlbumTitle
 object\nArtistName
 object\ndtype: object"},
 {"role": "user", "content": "Can you generate the Python plotly code to char
t the results of the dataframe? Assume the data is in a pandas dataframe cal
 led 'df'. If there is only one value in the dataframe, use an Indicator. Res
 pond with only Python code. Do not answer with any explanations -- just the
 code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:41:09.441666845Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\nim
 port plotly.offline as py\n = 1:\n
 fig = go.Figure(go.Indica
 tor(mode="text", value=df[\'AlbumTitle\'][0], title={"text": df[\'ArtistName
 \'][0]}))\nelse:\n
 fig = go.Figure(data=[go.Bar(x=df[\'AlbumTitle\'], y=d
 f.index, text=df[\'ArtistName\'], textposition=\'auto\', name=\'Albums by Ar
tist\')])\nfig.update layout(title="Albums and Their Artists")\npy.plot(fi
 g)'}, 'done reason': 'stop', 'done': True, 'total duration': 50087210650, 'l
 oad duration': 10899020, 'prompt eval count': 175, 'prompt eval duration': 1
 4615627000, 'eval_count': 113, 'eval_duration': 35326254000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
import plotly.offline as py
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="text", value=df['AlbumTitle'][0], title={"text": df['Artist
Name'][0]}))
else:
 fig = go.Figure(data=[go.Bar(x=df['AlbumTitle'], y=df.index, text=df['ArtistName'], textposi
tion='auto', name='Albums by Artist')])
fig.update layout(title="Albums and Their Artists")
py.plot(fig)
```



Number of requested results 10 is greater than number of elements in index 5, updating  $n_results = 5$ Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$  -----

====

# QUESTION - 7: Find all tracks with a name containing "What" (case-insensi tive)

\_\_\_\_\_\_

====

## [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n\nCR EATE INDEX IFK PlaylistTrackTrackId ON "playlist track" (TrackId)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n TypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(2 Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n 20),\r\n FOREIGN KEY (AlbumId) REFERENCES "alb tPrice NUMERIC(10,2) NOT NULL,\r\n ums" (Albumid) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n GN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION O N UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media type s" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCRE ATE INDEX IFK TrackAlbumId ON "tracks" (AlbumId)\n\nCREATE INDEX IFK TrackMe PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n GN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE IND EX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE INDEX IFK A lbumArtistId ON "albums" (ArtistId)\n\nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR  $(120)\r\n)\n\CREATE TABLE "genres"\r\n(\r\n$ GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\n===Additional Co ntext \n\nIn the chinook database invoice means order\n\n\n In the \'cust omers\' table, address column names do not have \'Billing\' prefix, \n g. country column name is \'country\', not \'BillingCountry\'\n sponse Guidelines \n1. If the provided context is sufficient, please generat e a valid SQL query without any explanations for the question. \n2. If the p rovided context is almost sufficient but requires knowledge of a specific st ring in a particular column, please generate an intermediate SQL query to fi nd the distinct strings in that column. Prepend the query with a comment say ing intermediate sql \n3. If the provided context is insufficient, please ex plain why it can\'t be generated. \n4. Please use the most relevant table (s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'role': 'assista nt', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'rol e': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'ta ble'"}, {'role': 'user', 'content': 'How many customers are there'}, {'rol e': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'use r', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCo untry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Custome rCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount D ESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Customer Count DESC \nLIMIT 5': no such column: BillingCountry .\n the error and re-generate the SQL\n "}, {'role': 'assistant', 'conten t': 'SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY C ountry \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'conten For the question which table stores customer's orders, \n the generated SQL statement invoices results in the following exception [ERR OR-SQL] the generated SQL : invoices\n does not starts with ('select','wit Please fix the error and re-generate the SQL\n ole': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'user', 'c ontent': 'Find all tracks with a name containing "What" (case-insensitive) '}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK TrackGenreId ON \"tracks\" (GenreId)\n\n CREATE INDEX IFK PlaylistTrackTrackId ON \"playlist track\" (TrackId)\n\nCRE TrackId INTEGER PRIMARY KEY AUTOINCREMENT N ATE TABLE \"tracks\"\r\n(\r\n Name NVARCHAR(200) NOT NULL,\r\n OT NULL,\r\n AlbumId INTEGER.\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARC  $HAR(220), \r\n$ Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n FOREIGN KEY (AlbumId) REFERENCES UnitPrice NUMERIC(10,2) NOT NULL,\r\n  $\$  (Albumid)  $\$  \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\t0N DELETE NO A CTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES \"med ia types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE INDEX IFK TrackAlbumId ON \"tracks\" (AlbumId)\n\nCREATE INDEX IFK TrackMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCREATE TABLE \"playlist track\"\r\n(\r\n PlavlistId INTEGER NOT NULL.\r\n TrackId INTEGER NO CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackI T NULL,\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACT ION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackI d)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (ArtistId)\n\nCREATE TABL PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT E \"playlists\"\r\n(\r\n Name NVARCHAR(120)\r\n)\n\nCREATE TABLE \"genres\"\r\n(\r\n NULL,\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(12 0)\r\n)\n\n===Additional Context \n\nIn the chinook database invoice means In the 'customers' table, address column names do not have 'B order\n\n\n illing' prefix, \n e.g. country column name is 'country', not 'BillingCou \n\n===Response Guidelines \n1. If the provided context is suffic ient, please generate a valid SQL query without any explanations for the que stion. \n2. If the provided context is almost sufficient but requires knowle

dge of a specific string in a particular column, please generate an intermed iate SQL query to find the distinct strings in that column. Prepend the quer y with a comment saying intermediate sql \n3. If the provided context is ins ufficient, please explain why it can't be generated. \n4. Please use the mos t relevant table(s). \n5. If the question has been asked and answered befor e, please repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistI d"}, {"role": "user", "content": "Can you list all tables in the SQLite data base catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqlite\_m aster WHERE type = 'table'"}, {"role": "user", "content": "How many customer s are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM custom ers"}, {"role": "user", "content": "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL state ment SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCou ntry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: BillingCountry .\n "}, {"role": "assistan Please fix the error and re-generate the SQL\n t", "content": "SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "use r", "content": "\n For the question which table stores customer's ord ers, \n the generated SQL statement invoices results in the following exception [ERROR-SQL] the generated SQL : invoices\n does not starts with Please fix the error and re-generate the SQL\n ('select','with') .\n "}, {"role": "assistant", "content": "SELECT \* FROM invoices"}, {"role": "us er", "content": "Find all tracks with a name containing \"What\" (case-insen sitive) "}] [( Ollama Response )] {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:43:04.206186937Z', 'me ssage': {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks W HERE LOWER(Name) LIKE '%what%'"}, 'done reason': 'stop', 'done': True, 'tota l duration': 114170074488, 'load duration': 12867235, 'prompt eval count': 1 012, 'prompt eval duration': 108019899000, 'eval count': 16, 'eval duratio n': 5269609000} [( LLM Response )] SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%' [( SQL )] generated SQL statement SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%' [( DATA )]

queried data frame

	TrackId	Name
0	26	What It Takes
1	88	What You Are
2	130	Do what cha wanna
3	342	What is and Should Never Be
4	607	So What
5	960	What A Day
6	1000	What If I Do?
7	1039	What Now My Love
8	1145	Whatsername
9	1440	Whatever It Is, I Just Can't Stop
10	1469	Look What You've Done
11	1470	Get What You Need
12	1628	What Is And What Should Never Be
13	1778	You're What's Happening (In The World Today)
14	1823	So What
15	2772	I Don't Know What To Do With Myself
16	2884	What Kate Did
17	2893	Whatever the Case May Be
18	2992	I Still Haven't Found What I'm Looking for
19	3007	I Still Haven't Found What I'm Looking For
20	3258	Whatever Gets You Thru the Night
21	3475	What Is It About Men

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Fi
 nd all tracks with a name containing \"What\" (case-insensitive) '\n\nThe Da
 taFrame was produced using this query: SELECT TrackId, Name FROM tracks WHER
 E LOWER(Name) LIKE '%what%'\n\nThe following is information about the result
 ing pandas DataFrame 'df': \nRunning df.dtypes gives:\n TrackId
 object\ndtype: object"}, {"role": "user", "content": "Can you gene
 rate the Python plotly code to chart the results of the dataframe? Assume th
 e data is in a pandas dataframe called 'df'. If there is only one value in t
 he dataframe, use an Indicator. Respond with only Python code. Do not answer
with any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:43:42.109977455Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\nif
 len(df) == 1:\n
 fig = go.Figure(go.Indicator(mode="text", value=df[\'Name
\'][0]))\nelse:\n
 fig = go.Figure(data=[go.Bar(x=df[\'TrackId\'], y=df
 [\'Name\'].str.len(), text=df[\'Name\'], textposition=\'auto\')])\nfig.show
 ()'}, 'done reason': 'stop', 'done': True, 'total duration': 37874007949, 'l
 oad duration': 12594084, 'prompt eval count': 167, 'prompt eval duration': 1
 3958564000, 'eval count': 76, 'eval duration': 23774227000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = qo.Figure(qo.Indicator(mode="text", value=df['Name'][0]))
 fig = go.Figure(data=[go.Bar(x=df['TrackId'], y=df['Name'].str.len(), text=df['Name'], textpo
sition='auto')])
```



Number of requested results 10 is greater than number of elements in index 6, updating n\_results = 6Number of requested results 10 is greater than number of elements in index 2, updating n\_results = 2 \_\_\_\_\_\_

====

# QUESTION - 8: Get the total number of invoices for each customer

\_\_\_\_\_

====

[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE INDEX IFK I nvoiceLineInvoiceId ON "invoice\_items" (InvoiceId)\n\nCREATE TABLE "invoice\_ InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL  $items"\r\n(\r\n$ InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION.\r\n FOREIGN KEY (TrackId) REFERENCES "trac ks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE TABLE "c ustomers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL FirstName NVARCHAR(40) NOT NULL,\r\n L.\r\n LastName NVARCHAR(20) NO T NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n v NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportR epId ON "customers" (SupportRepId)\n\nCREATE TABLE "employees"\r\n(\r\n mployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCH AR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL,\r\n Title NVAR  $CHAR(30), \r\n$ ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n te DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n tate NVARCHAR(40),\r\n PostalCode NVARCHAR(1  $0), \r\n$ Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHA FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK Emplo yeeReportsTo ON "employees" (ReportsTo)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(20 AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NUL 0) NOT NULL.\r\n L.\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n s INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) N FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t OT NULL,\r\n ON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERE NCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n In the \'customers\' tabl e, address column names do not have \'Billing\' prefix, \n e.g. country c

olumn name is \'country\', not \'BillingCountry\'\n \n\n===Response Guide lines \n1. If the provided context is sufficient, please generate a valid SQ L query without any explanations for the question. \n2. If the provided cont ext is almost sufficient but requires knowledge of a specific string in a pa rticular column, please generate an intermediate SQL query to find the disti nct strings in that column. Prepend the guery with a comment saying intermed iate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactl y as it was given before. \n'}, {'role': 'user', 'content': 'How many custom ers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM cust omers'}, {'role': 'user', 'content': "\n For the question which table stores customer's orders, \n the generated SQL statement invoices res ults in the following exception [ERROR-SQL] the generated SQL : invoices\n d oes not starts with ('select','with') .\n Please fix the error and re -generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT \* FR OM invoices'}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated S QL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM custome rs \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingC ountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT Bi llingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingC ountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: BillingCoun Please fix the error and re-generate the SQL\n ole': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCount \nF ROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, a r.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.Ar tistId'}, {'role': 'user', 'content': 'Find all tracks with a name containin g "What" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT Tra ckId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'rol e': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'ta ble'"}, {'role': 'user', 'content': 'Get the total number of invoices for ea ch customer'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

## [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE INDEX IFK

InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"inv oice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NUL  $L,\r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NU FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n LL,\r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) RE FERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO N\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId) \n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AU TOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n me NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVARC  $HAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n  $NVARCHAR(40), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId I FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (Employee NTEGER,\r\n Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (SupportRepId)\n\nCREATE TABLE \"empl oyees\" $\r\n(\r\n$ EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NU LL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n BirthDate DA HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n TETIME,\r\n  $VARCHAR(40), \r\n$ State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"e mployees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE INDEX IFK EmployeeReportsTo ON \"employees\" (ReportsTo)\n\nCREAT E TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n Composer NVARCHA diaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n  $R(220), \r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO A CTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES \"med ia\_types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\n===Additional Context \n\nIn the chinook database invoice means ord In the 'customers' table, address column names do not have 'Bill er\n\n\n ing' prefix, \n e.g. country column name is 'country', not 'BillingCountr \n\n===Response Guidelines \n1. If the provided context is sufficien t, please generate a valid SQL query without any explanations for the questi on. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query wit h a comment saying intermediate sql \n3. If the provided context is insuffic ient, please explain why it can't be generated. \n4. Please use the most rel evant table(s). \n5. If the question has been asked and answered before, ple ase repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "\n r the question which table stores customer's orders, \n SQL statement invoices results in the following exception [ERROR-SQL] the ge nerated SQL : invoices\n does not starts with ('select','with') .\n lease fix the error and re-generate the SQL\n "}, {"role": "assistan t", "content": "SELECT \* FROM invoices"}, {"role": "user", "content": "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount

\nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumT itle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all tracks with a name co ntaining \"What\" (case-insensitive) "}, {"role": "assistant", "content": "S ELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": "Can you list all tables in the SQLite database catalo g?"}, {"role": "assistant", "content": "SELECT name FROM sqlite\_master WHERE type = 'table'"}, {"role": "user", "content": "Get the total number of invoi ces for each customer"}] [( Ollama Response )] {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:46:41.99681322Z', 'mes sage': {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invo ices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName; '}, 'done reason': 'stop', 'done': True, 'total duration': 179769 849857, 'load duration': 11832793, 'prompt eval count': 1420, 'prompt eval d uration': 160520963000, 'eval count': 51, 'eval duration': 18216246000} [( LLM Response )] SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInv oices FROM customers c JOIN invoices i ON c.CustomerId = i.CustomerId GROUP BY c.CustomerId, c.FirstName, c.LastName; [( Output from LLM )] SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalIn voices FROM customers c JOIN invoices i ON c.CustomerId = i.CustomerId GROUP BY c.CustomerId, c.FirstName, c.LastName; [( Extracted SQL )] SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalIn voices

FROM customers c JOIN invoices i ON c.CustomerId = i.CustomerId GROUP BY c.CustomerId, c.FirstName, c.LastName

file:///home/gongai/Downloads/ollama-qwen2.5-14b-chromadb-sqlite-test-3.html

generated SQL statement

[( SQL )]

**SELECT c**.CustomerId, **c**.FirstName, **c**.LastName, **COUNT**(i.InvoiceId) **AS** TotalInvoices

**FROM** customers **c** 

JOIN invoices i ON c.CustomerId = i.CustomerId

**GROUP BY c**.CustomerId, **c**.FirstName, **c**.LastName

[( DATA )]
queried data frame

	CustomerId	FirstName	LastName	TotalInvoices
0	1	Luís	Gonçalves	7
1	2	Leonie	Köhler	7
2	3	François	Tremblay	7
3	4	Bjørn	Hansen	7
4	5	František	Wichterlová	7
5	6	Helena	Holý	7
6	7	Astrid	Gruber	7
7	8	Daan	Peeters	7
8	9	Кага	Nielsen	7
9	10	Eduardo	Martins	7
10	11	Alexandre	Rocha	7
11	12	Roberto	Almeida	7
12	13	Fernanda	Ramos	7
13	14	Mark	Philips	7
14	15	Jennifer	Peterson	7
15	16	Frank	Harris	7
16	17	Jack	Smith	7
17	18	Michelle	Brooks	7
18	19	Tim	Goyer	7
19	20	Dan	Miller	7
20	21	Kathy	Chase	7
21	22	Heather	Leacock	7
22	23	John	Gordon	7
23	24	Frank	Ralston	7
24	25	Victor	Stevens	7
25	26	Richard	Cunningham	7
26	27	Patrick	Gray	7
27	28	Julia	Barnett	7
28	29	Robert	Brown	7
29	30	Edward	Francis	7
30	31	Martha	Silk	7
31	32	Aaron	Mitchell	7
32	33	Ellie	Sullivan	7
33	34	João	Fernandes	7

	CustomerId	FirstName	LastName	TotalInvoices
34	35	Madalena	Sampaio	7
35	36	Hannah	Schneider	7
36	37	Fynn	Zimmermann	7
37	38	Niklas	Schröder	7
38	39	Camille	Bernard	7
39	40	Dominique	Lefebvre	7
40	41	Marc	Dubois	7
41	42	Wyatt	Girard	7
42	43	Isabelle	Mercier	7
43	44	Terhi	Hämäläinen	7
44	45	Ladislav	Kovács	7
45	46	Hugh	O'Reilly	7
46	47	Lucas	Mancini	7
47	48	Johannes	Van der Berg	7
48	49	Stanisław	Wójcik	7
49	50	Enrique	Muñoz	7
50	51	Joakim	Johansson	7
51	52	Emma	Jones	7
52	53	Phil	Hughes	7
53	54	Steve	Миггау	7
54	55	Mark	Taylor	7
55	56	Diego	Gutiérrez	7
56	57	Luis	Rojas	7
57	58	Manoj	Pareek	7
58	59	Puja	Srivastava	6

```
[Ollama parameters]
model=gwen2.5:14b,
options={},
keep alive=None
```

[( Prompt Content )]

[{"role": "system", "content": "The following is a pandas DataFrame that con tains the results of the query that answers the question the user asked: 'Ge t the total number of invoices for each customer'\n\nThe DataFrame was produ ced using this query: SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i. InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.Customer Id = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\n\nThe fol lowing is information about the resulting pandas DataFrame 'df': \nRunning d f.dtypes gives:\n CustomerId int64\nFirstName object\nLastName object\nTotalInvoices int64\ndtype: object"}, {"role": "user", "conten t": "Can you generate the Python plotly code to chart the results of the dat aframe? Assume the data is in a pandas dataframe called 'df'. If there is on ly one value in the dataframe, use an Indicator. Respond with only Python co de. Do not answer with any explanations -- just the code."}]

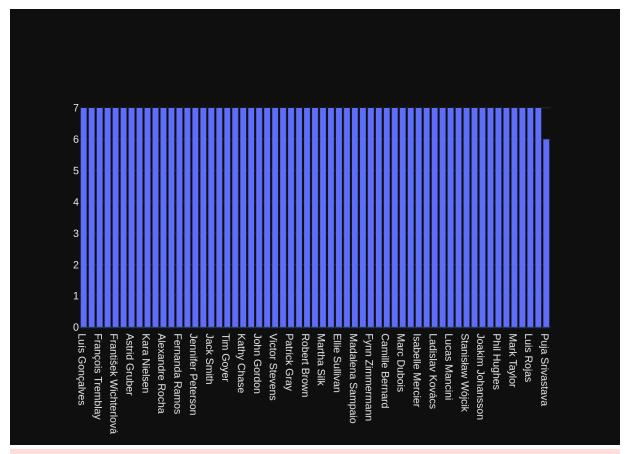
# [( Ollama Response )]

{'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:47:26.614526743Z', 'me ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\nim port plotly.io as pio\n\nif len(df) == 1:\n fig = go.Figure(go.Indicator (mode="number", value=df[\'TotalInvoices\'].values[0]))\nelse:\n o.Figure(data=[qo.Bar(x=df[\'FirstName\'] + \' \' + df[\'LastName\'], y=df [\'TotalInvoices\'])])\n\npio.show(fig)'}, 'done reason': 'stop', 'done': Tr ue, 'total duration': 44581796224, 'load duration': 13609759, 'prompt eval c ount': 207, 'prompt eval duration': 17549408000, 'eval count': 86, 'eval dur ation': 26930614000}



```
[(PYTHON)]
generated Plotly code
import plotly.graph_objs as go
import plotly.io as pio

if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['TotalInvoices'].values[0]))
else:
 fig = go.Figure(data=[go.Bar(x=df['FirstName'] + ' ' + df['LastName'], y=df['TotalInvoices'])])
pio.show(fig)
```



Number of requested results 10 is greater than number of elements in index 7, updating n results = 7

# QUESTION - 9: Find the total number of invoices per country

Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL.\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou BillingPostalCode NVARCHAR(10),\r\n ntry NVARCHAR(40),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE TABLE "invo ice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT N ULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NUL FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\t  $L,\r\n$ ON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERE NCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE INDEX IFK InvoiceLineInvoiceId ON "invoice items" (InvoiceId)\n\n CREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE T EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NO ABLE "employees"\r\n(\r\n LastName NVARCHAR(20) NOT NULL,\r\n T NULL,\r\n FirstName NVARCHAR(2 0) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n rthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40).\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHA FOREIGN KEY (ReportsTo) REFERENCES Email NVARCHAR(60),\r\n "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY A UTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n ame NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVAR City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n  $CHAR(70), \r\n$ Countr y  $NVARCHAR(40), \r\n$ PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n epId INTEGER.\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (Empl oyeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK EmployeeReportsTo ON "employees" (ReportsTo)\n\nCREATE TABLE "albums"\r AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN K EY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n  $R_{r} r n$ Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT E NO ACTION.\r\n FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media\_types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n\n\n\n===Additional Context \r\nIn the chinook database in voice means order\n\n\n In the \'customers\' table, address column names do not have \'Billing\' prefix, \n e.g. country column name is \'country \', not \'BillingCountry\'\n \n\n===Response Guidelines \n1. If the provi ded context is sufficient, please generate a valid SQL query without any exp lanations for the question. \n2. If the provided context is almost sufficien t but requires knowledge of a specific string in a particular column, please

generate an intermediate SQL query to find the distinct strings in that colu mn. Prepend the query with a comment saying intermediate sql \n3. If the pro vided context is insufficient, please explain why it can\'t be generated. \n 4. Please use the most relevant table(s). \n5. If the question has been aske d and answered before, please repeat the answer exactly as it was given befo re. \n'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.Fi rstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\n JOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.Fir stName, c.LastName'}, {'role': 'user', 'content': "\n For the questio n which table stores customer's orders, \n the generated SQL statemen t invoices results in the following exception [ERROR-SQL] the generated SQL : invoices\n does not starts with ('select','with') .\n Please fix th e error and re-generate the SQL\n "}, {'role': 'assistant', 'conten t': 'SELECT \* FROM invoices'}, {'role': 'user', 'content': "\n e question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'rol e': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS Artist Name \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'rol e': 'user', 'content': 'Find all tracks with a name containing "What" (caseinsensitive) '}, {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Can y ou list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'Find the total number of invoices per country'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL.\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou BillingPostalCode NVARCHAR(10),\r\n ntry NVARCHAR(40),\r\n Total NUMER FOREIGN KEY (CustomerId) REFERENCES \"customers\" IC(10,2) NOT NULL,\r\n (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE TABLE \"i InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT N nvoice items\"\r\n(\r\n

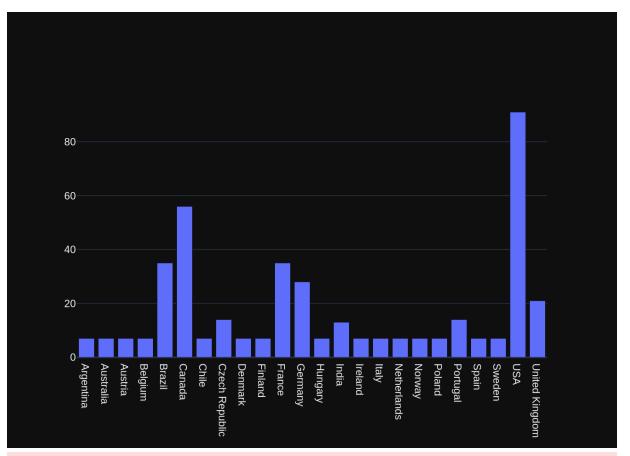
InvoiceId INTEGER NOT NULL,\r\n OT NULL.\r\n TrackId INTEGER NOT NUL UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NU FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n LL.\r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) RE FERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO N\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (Invoic eId)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId)\n \nCREATE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTO INCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n ReportsTo INTEGE NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n R, r nBirthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARC  $HAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n  $NVARCHAR(40), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NUL LastName NVARCHAR(20) NOT NULL,\r\n  $L,\r\n$ Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVA Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n  $RCHAR(24), \r\n$ FOREIGN KEY (SupportRepId) REFERENCES \"employe SupportRepId INTEGER,\r\n es\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCR EATE INDEX IFK EmployeeReportsTo ON \"employees\" (ReportsTo)\n\nCREATE TABL AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL E \"albums\"\r\n(\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NUL  $L,\r\n$ FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\t0  $L,\r\n$ N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"tracks\"\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n (\r\n RCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NO T NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n econds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10, 2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreI d) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (MediaTypeId) REFERENCES \"media types\" (MediaTy peId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additiona l Context \n\nIn the chinook database invoice means order\n\n\n ustomers' table, address column names do not have 'Billing' prefix, \n g. country column name is 'country', not 'BillingCountry'\n \n\n===Respon se Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provi ded context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find th e distinct strings in that column. Prepend the query with a comment saying i ntermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before.  $\n"$ }, {"role": "user", "content": "Get the t otal number of invoices for each customer"}, {"role": "assistant", "conten t": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS Tot alInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId \nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "user", "conten t": "\n For the question which table stores customer's orders, \n the generated SQL statement invoices results in the following exception [ERR OR-SQL] the generated SQL : invoices\n does not starts with ('select','wit

h') .\n Please fix the error and re-generate the SQL\n ole": "assistant", "content": "SELECT \* FROM invoices"}, {"role": "user", "c ontent": "\n For the question what are the top 5 countries that custo mers come from?, \n the generated SQL statement SELECT BillingCountr y, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nOR DER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERRO R-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCoun t \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as Cust omerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCoun t DESC \nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY Count ry \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "user", "content": "H ow many customers are there"}, {"role": "assistant", "content": "SELECT COUN T(\*) FROM customers"}, {"role": "user", "content": "List all albums and thei r corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all trac ks with a name containing \"What\" (case-insensitive) "}, {"role": "assistan t", "content": "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%wh at%'"}, {"role": "user", "content": "Can you list all tables in the SQLite d atabase catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqlit e master WHERE type = 'table'"}, {"role": "user", "content": "Find the total number of invoices per country"}] [( Ollama Response )] {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:50:37.667644711Z', 'me ssage': {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceI d) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.C ustomerId\nGROUP BY c.Country'}, 'done reason': 'stop', 'done': True, 'total duration': 190804028075, 'load duration': 21585115, 'prompt eval count': 15 35, 'prompt eval duration': 176756459000, 'eval count': 36, 'eval duration': 12869235000} [( LLM Response )] SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices FROM customers c JOIN invoices i ON c.CustomerId = i.CustomerId

GROUP BY c.Country [( SQL )] generated SQL statement **SELECT c**.Country, **COUNT**(i.InvoiceId) **AS** TotalInvoices FROM customers c **JOIN** invoices i **ON c**.CustomerId = i.CustomerId **GROUP BY c**.Country [( DATA )] queried data frame

	Country	TotalInvoices
0	Argentina	7
1	Australia	7
2	Austria	7
3	Belgium	7
4	Brazil	35
5	Canada	56
6	Chile	7
7	Czech Republic	14
8	Denmark	7
9	Finland	7
10	France	35
11	Germany	28
12	Hungary	7
13	India	13
14	Ireland	7
15	Italy	7
16	Netherlands	7
17	Norway	7
18	Poland	7
19	Portugal	14
20	Spain	7
21	Sweden	7
22	USA	91
23	United Kingdom	21

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Fi
 nd the total number of invoices per country'\n\nThe DataFrame was produced u
 sing this guery: SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM
 customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Coun
 trv\n\nThe following is information about the resulting pandas DataFrame 'd
 f': \nRunning df.dtypes gives:\n Country
 object\nTotalInvoices
 int64\ndtype: object"}, {"role": "user", "content": "Can you generate the Py
 thon plotly code to chart the results of the dataframe? Assume the data is i
 n a pandas dataframe called 'df'. If there is only one value in the datafram
 e, use an Indicator. Respond with only Python code. Do not answer with any e
 xplanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:51:14.294270474Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objects as go
 \n \in \n
 fig = go.Figure(go.Indicator(mode="number", value=
 df[\'TotalInvoices\'].iloc[0]))\nelse:\n
 fig = go.Figure([go.Bar(x=df[\'C
 ountry\'], y=df[\'TotalInvoices\'])])\nfig.show()'}, 'done_reason': 'stop',
 'done': True, 'total duration': 36592969742, 'load duration': 10926912, 'pro
 mpt eval count': 181, 'prompt eval duration': 15202319000, 'eval count': 68,
 'eval duration': 21244202000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph_objects as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['TotalInvoices'].iloc[0]))
else:
 fig = go.Figure([go.Bar(x=df['Country'], y=df['TotalInvoices'])])
```



Number of requested results 10 is greater than number of elements in index 8, updating  $n_results = 8$ Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$  \_\_\_\_\_\_

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# QUESTION - 10: List all invoices with a total exceeding \$10

\_\_\_\_\_

====

[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoice items"\r\n(\r\n InvoiceLineId IN TEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NUL TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NUL Quantity INTEGER NOT NULL,\r\n  $L,\r\n$ FOREIGN KEY (InvoiceId) REFEREN CES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DEL ETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoic eId ON "invoice items" (InvoiceId)\n\nCREATE TABLE "invoices"\r\n(\r\n voiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGE InvoiceDate DATETIME NOT NULL,\r\n R NOT NULL,\r\n BillingAddress NV  $ARCHAR(70), \r\n$ BillingCity NVARCHAR(40),\r\n BillingState NVARCHAR(4 BillingPostalCode NVARCHAR(1 0), r nBillingCountry NVARCHAR(40),\r\n Total NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) RE 0), r nFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO A CTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackI d)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREAT E TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT N Name NVARCHAR(200) NOT NULL,\r\n ULL,\r\n AlbumId INTEGER,\r\n iaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n nitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES "a lbums" (Albumid) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n EIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media type s" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCRE ATE INDEX IFK EmployeeReportsTo ON "employees" (ReportsTo)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL  $L,\r\n$ FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(20) NO T NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n State NVARCHAR(40),\r\n y  $NVARCHAR(40), \r\n$ Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\CREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARC FirstName NVARCHAR(20) NOT NULL,\r\n HAR(20) NOT NULL,\r\n Title NVA  $RCHAR(30), \r\n$ ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n ate DATETIME,\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR Phone NVARCHAR(24),\r\n  $(10), \r\n$ Fax NVARCHAR(24),\r\n Email NVARC FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId)  $HAR(60), \r\n$ \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK Cus tomerSupportRepId ON "customers" (SupportRepId)\n\n\===Additional Context \n\nIn the chinook database invoice means order\n\n\n In the \'customers \' table, address column names do not have \'Billing\' prefix, \n

untry column name is \'country\', not \'BillingCountry\'\n e Guidelines \nl. If the provided context is sufficient, please generate a v alid SQL query without any explanations for the question. \n2. If the provid ed context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find th e distinct strings in that column. Prepend the guery with a comment saying i ntermediate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'Get the t otal number of invoices for each customer'}, {'role': 'assistant', 'conten t': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS Tot alInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId \nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'conten t': 'Find the total number of invoices per country'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM cust omers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Countr y'}, {'role': 'user', 'content': "\n For the question which table sto res customer's orders, \n the generated SQL statement invoices result s in the following exception [ERROR-SQL] the generated SQL : invoices $\n$  does not starts with ('select','with') .\n Please fix the error and re-gen "}, {'role': 'assistant', 'content': 'SELECT \* FROM i erate the SOL\n nvoices'}, {'role': 'user', 'content': 'How many customers are there'}, {'ro le': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'us er', 'content': "\n For the question what are the top 5 countries tha t customers come from?, \n the generated SQL statement SELECT Billing Country, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountr y \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Custome rCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount D ESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Customer Count DESC \nLIMIT 5': no such column: BillingCountry .\n Please fix "}, {'role': 'assistant', 'conten the error and re-generate the SQL\n t': 'SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY C ountry \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'conten t': 'List all albums and their corresponding artist names '}, {'role': 'ass istant', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nF ROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'use r', 'content': 'Find all tracks with a name containing "What" (case-insensit ive) '}, {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'conten t': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}]

```
[Ollama parameters]
model=qwen2.5:14b,
options={},
keep_alive=None

[(Prompt Content)]
[{"role": "system", "content": "You are a SQLite expert. Please help to gene
rate a SQL query to answer the question. Your response should ONLY be based
on the given context and follow the response guidelines and format instructi
ons. \n===Tables \nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId)
```

INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NU TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NU LL.\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERE NCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON D ELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvo iceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTE InvoiceDate DATETIME NOT NULL,\r\n GER NOT NULL,\r\n BillingAddress  $NVARCHAR(70), \r\n$ BillingCity NVARCHAR(40),\r\n BillingState NVARCHAR BillingCountry NVARCHAR(40),\r\n (40), r nBillingPostalCode NVARCHAR (10), r nTotal NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId) \n\nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGE R, r nMediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Comp oser NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACT FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFER ENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK EmployeeReportsTo ON \"employees\" (ReportsT o)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n Name NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVA City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n  $RCHAR(70), \r\n$ PostalCode NVARCHAR(10),\r\n ry NVARCHAR(40),\r\n Phone NVARCHAR(2 Email NVARCHAR(60) NOT NULL,\r\n 4),\r\n Fax NVARCHAR(24),\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employees portRepId INTEGER,\r\n \" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREA TE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREM ENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARC HAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n HireDate DATETIME,\r\n BirthDate DATETIME,\r\n Address NVARCHAR(70),\r City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR (40), r nPostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFE  $NVARCHAR(24), \r\n$ RENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO A CTION\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (Suppor tRepId)\n\n===Additional Context \n\nIn the chinook database invoice means In the 'customers' table, address column names do not have 'B order\n\n\n illing' prefix, \n e.g. country column name is 'country', not 'BillingCou \n\n===Response Guidelines \n1. If the provided context is suffic ient, please generate a valid SQL query without any explanations for the que stion. \n2. If the provided context is almost sufficient but requires knowle dge of a specific string in a particular column, please generate an intermed iate SQL query to find the distinct strings in that column. Prepend the quer y with a comment saying intermediate sql \n3. If the provided context is ins ufficient, please explain why it can't be generated. \n4. Please use the mos t relevant table(s). \n5. If the question has been asked and answered befor e, please repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastNa

me, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i 0 N c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastNam e"}, {"role": "user", "content": "Find the total number of invoices per coun try"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.InvoiceI d) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.C ustomerId\nGROUP BY c.Country"}, {"role": "user", "content": "\n the question which table stores customer's orders, \n the generated S QL statement invoices results in the following exception [ERROR-SQL] the gen erated SQL : invoices\n does not starts with ('select','with') .\n ease fix the error and re-generate the SQL\n "}, {"role": "assistan t", "content": "SELECT \* FROM invoices"}, {"role": "user", "content": "How m any customers are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "\n For the auestion wh at are the top 5 countries that customers come from?, \n the generate d SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM cust omers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 resu Its in the following exception [ERROR-DB] Failed to execute SQL: SELECT Bill ingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCou ntry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELE CT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY Bil lingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: Billin gCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumT itle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all tracks with a name co ntaining \"What\" (case-insensitive) "}, {"role": "assistant", "content": "S ELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": "Can vou list all tables in the SOLite database catalo g?"}, {"role": "assistant", "content": "SELECT name FROM sqlite\_master WHERE type = 'table'"}, {"role": "user", "content": "List all invoices with a tota l exceeding \$10"}] [( Ollama Response )] {'model': 'qwen2.5:14b', 'created\_at': '2024-10-12T23:54:18.842728059Z', 'me ssage': {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoi ces WHERE Total > 10'}, 'done\_reason': 'stop', 'done': True, 'total\_duratio n': 184453861217, 'load duration': 11178852, 'prompt eval count': 1542, 'pro mpt eval duration': 178358787000, 'eval count': 14, 'eval duration': 4828695 000} [( LLM Response )] SELECT InvoiceId, Total FROM invoices WHERE Total > 10 [( SQL )] generated SQL statement **SELECT** InvoiceId, Total **FROM** invoices **WHERE** Total > 10 [( DATA )] queried data frame

	InvoiceId	Total
0	5	13.86
1	12	13.86
2	19	13.86
3	26	13.86
4	33	13.86
•••	•••	
59	383	13.86
60	390	13.86
61	397	13.86
62	404	25.86
63	411	13.86

#### 64 rows × 2 columns

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

## [( Prompt Content )]

[{"role": "system", "content": "The following is a pandas DataFrame that con tains the results of the query that answers the question the user asked: 'Li st all invoices with a total exceeding \$10'\n\nThe DataFrame was produced us ing this query: SELECT InvoiceId, Total FROM invoices WHERE Total > 10\n\nTh e following is information about the resulting pandas DataFrame 'df': \nRunn ing df.dtypes gives:\n InvoiceId int64\nTotal float64\ndtype: ob ject"}, {"role": "user", "content": "Can you generate the Python plotly code to chart the results of the dataframe? Assume the data is in a pandas datafr ame called 'df'. If there is only one value in the dataframe, use an Indicat or. Respond with only Python code. Do not answer with any explanations -- ju st the code."}]

## 

[( PYTHON )]
generated Plotly code

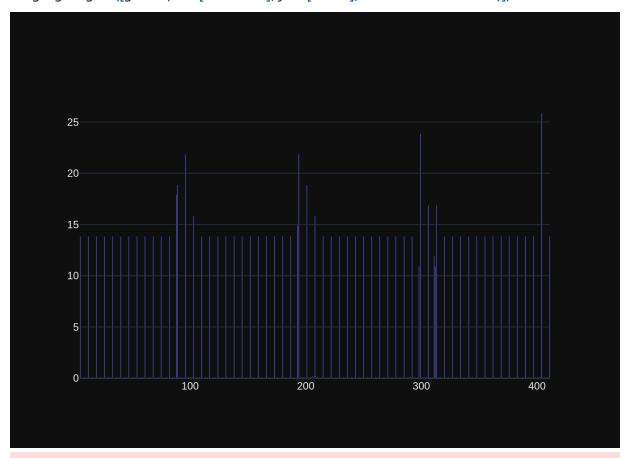
# import plotly.graph\_objects as go

**if** len(df) **==** 1:

fig = go.Figure(go.Indicator(mode="value", value=df['Total'].iloc[0]))

## else:

fig = go.Figure([go.Bar(x=df['InvoiceId'], y=df['Total'], name='Invoice Totals')])



Number of requested results 10 is greater than number of elements in index 9, updating  $n_results = 9$ 

Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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# QUESTION - 11: Find all invoices since 2010 and the total amount invoice d:

\_\_\_\_\_\_

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### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId)  $\r \n \t \n \$  DELETE NO ACTION ON UPDATE NO ACTION $\r \n \n \$ TABLE "invoice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) NOT NULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON "invoice items" (Invoi ceId)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCR EATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE TAB EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT LE "employees"\r\n(\r\n NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n ate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHA  $R(24), \r\n$ Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY A UTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n ame NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVAR  $CHAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n y NVARCHAR(40),\r\n Phone NVARCHAR(24),\r Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (Empl epId INTEGER,\r\n oyeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INT Composer NVARCHAR(220),\r\n GenreId INTEGER,\r\n EGER NOT NULL,\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMER FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumI IC(10,2) NOT NULL,\r\n d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (Genr eId) REFERENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaType Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "al  $bums"\r\n(\r\n$ AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n EIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\t0N DELETE NO ACT

ION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlist track"\r\n(\r\n TrackId INTEGER NOT NULL,\r\n aylistId INTEGER NOT NULL,\r\n INT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (Track Id) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n\n stomers\' table, address column names do not have \'Billing\' prefix, \n e.g. country column name is \'country\', not \'BillingCountry\'\n Response Guidelines \n1. If the provided context is sufficient, please gener ate a valid SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific s tring in a particular column, please generate an intermediate SQL query to f ind the distinct strings in that column. Prepend the query with a comment sa ying intermediate sql \n3. If the provided context is insufficient, please e xplain why it can\'t be generated. \n4. Please use the most relevant table (s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'cont ent': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'u ser', 'content': 'Get the total number of invoices for each customer'}, {'ro le': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c. CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'Find the total number of invoices per countr y'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust omerId\nGROUP BY c.Country'}, {'role': 'user', 'content': "\n question which table stores customer's orders, \n the generated SQL s tatement invoices results in the following exception [ERROR-SQL] the generat ed SQL : invoices\n does not starts with ('select', 'with') .\n "}, {'role': 'assistant', 'co fix the error and re-generate the SQL\n ntent': 'SELECT \* FROM invoices'}, {'role': 'user', 'content': 'How many cus tomers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM c ustomers'}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL s tatement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCoun try, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \n ORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT Bill ingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCou ntry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: BillingCountr Please fix the error and re-generate the SQL\n "}, {'rol y .\n e': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCount \nFRO M customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, a r.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.Ar tistId'}, {'role': 'user', 'content': 'Find all tracks with a name containin g "What" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT Tra ckId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'rol e': 'assistant', 'content': "SELECT name FROM sqlite\_master WHERE type = 'ta ble'"}, {'role': 'user', 'content': 'Find all invoices since 2010 and the to tal amount invoiced:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL.\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId)  $\r \n \t \n \$  DELETE NO ACTION ON UPDATE NO ACTION $\r \n \n \$ TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOIN CREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL.\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) NOT NULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (I nvoiceId)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId) \n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId)\n\nCR EATE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVA Title NVARCHAR(30),\r\n RCHAR(20) NOT NULL,\r\n ReportsTo INTEGER,\r BirthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n (70), r nCountry NV PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24), $\r\n$  $ARCHAR(40), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NUL LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n State NVARCHAR(40),\r Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVA  $RCHAR(24), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employe es\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCR EATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n NOT NULL,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARC  $HAR(220), \r\n$ Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO A CTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES \"med ia types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r  $\n)\n\n\CREATE TABLE \"albums\"\r\n(\r\n$ AlbumId INTEGER PRIMARY KEY AUTOI NCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INT FOREIGN KEY (ArtistId) REFERENCES \"artists\" (Artist EGER NOT NULL,\r\n Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"p PlaylistId INTEGER NOT NULL,\r\n TrackId INT laylist track\"\r\n(\r\n

EGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (Playlist TrackId),\r\n Id) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (Tra ckid) REFERENCES \"tracks\" (Trackid) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook database invoic In the 'customers' table, address column names do not e means order\n\n\n have 'Billing' prefix, \n e.g. country column name is 'country', not 'Bil lingCountry'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for t he question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an in termediate SQL query to find the distinct strings in that column. Prepend th e query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use t he most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n"}, {"rol e": "user", "content": "List all invoices with a total exceeding \$10"}, {"ro le": "assistant", "content": "SELECT InvoiceId, Total FROM invoices WHERE To tal > 10"}, {"role": "user", "content": "Get the total number of invoices fo r each customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c. FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c \nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.F irstName, c.LastName"}, {"role": "user", "content": "Find the total number o f invoices per country"}, {"role": "assistant", "content": "SELECT c.Countr y, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "conten For the question which table stores customer's orders, \n the generated SQL statement invoices results in the following exception [ERR OR-SQL] the generated SQL : invoices\n does not starts with ('select','wit Please fix the error and re-generate the SQL\n ole": "assistant", "content": "SELECT \* FROM invoices"}, {"role": "user", "c ontent": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "\n Fo r the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum Please fix the error and re-generate the SQL\n n: BillingCountry .\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumT itle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all tracks with a name co ntaining \"What\" (case-insensitive) "}, {"role": "assistant", "content": "S ELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": "Can you list all tables in the SQLite database catalo g?"}, {"role": "assistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}]

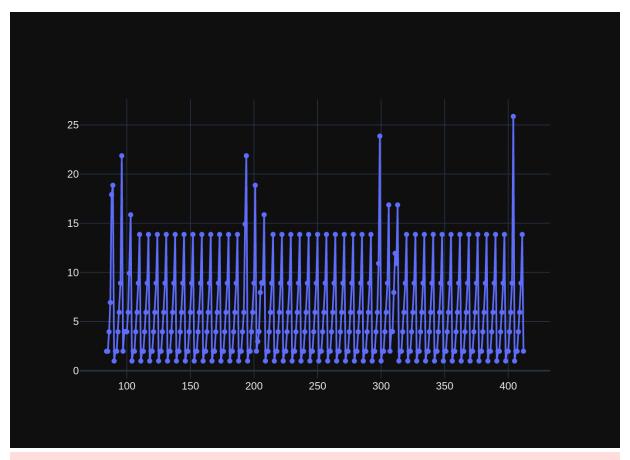
[( Ollama Response )]

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 l count': 1706, 'prompt eval duration': 201404611000, 'eval count': 26, 'eva
 l duration': 9298631000}
 [(LLM Response)]
 SELECT InvoiceId, Total
 FROM invoices
WHERE InvoiceDate >= '2010-01-01';
 [(Output from LLM)]
 SELECT InvoiceId, Total
 FROM invoices
WHERE InvoiceDate >= '2010-01-01';
 [(Extracted SQL)]
 SELECT InvoiceId, Total
 FROM invoices
WHERE InvoiceDate >= '2010-01-01'
[(SQL)]
generated SQL statement
SELECT InvoiceId, Total
FROM invoices
WHERE InvoiceDate >= '2010-01-01'
 [(DATA)]
queried data frame
 InvoiceId Total
 0
 84
 1.98
 1
 85
 1.98
 2
 86
 3.96
 3
 87 6.94
 4
 88 17.91

324
 408 3.96
325
 409 5.94
326
 410 8.91
327
 411 13.86
328
 412 1.99
```

329 rows × 2 columns

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Fi
 nd all invoices since 2010 and the total amount invoiced: '\n\nThe DataFrame
was produced using this query: SELECT InvoiceId, Total \nFROM invoices \nWHE
RE InvoiceDate >= '2010-01-01'\n\nThe following is information about the res
 ulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n InvoiceId
 float64\ndtype: object"}, {"role": "user", "content": "Can
t64\nTotal
you generate the Python plotly code to chart the results of the dataframe? A
 ssume the data is in a pandas dataframe called 'df'. If there is only one va
 lue in the dataframe, use an Indicator. Respond with only Python code. Do no
t answer with any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-12T23:59:03.300786165Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\n\n
 if len(df) == 1:\n
 fig = go.Figure(go.Indicator(mode="number", value=df
 [\'Total\'].iloc[0]))\nelse:\n
 fig = go.Figure([go.Scatter(x=df[\'Invoice
 Id\'], y=df[\'Total\'], mode=\'markers+lines\')])\nfig.show()'}, 'done reaso
 n': 'stop', 'done': True, 'total duration': 36909945193, 'load duration': 10
682812, 'prompt eval count': 179, 'prompt eval duration': 14963051000, 'eval
 count': 71, 'eval duration': 21890570000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['Total'].iloc[0]))
 fig = go.Figure([go.Scatter(x=df['InvoiceId'], y=df['Total'], mode='markers+lines')])
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

\_\_\_\_\_\_

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# QUESTION - 12: List all employees and their reporting manager's name (if any):

\_\_\_\_\_\_

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## [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK\_EmployeeReportsTo ON "employees" (Report sTo)\n\nCREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n Name NVARCHAR(20) NOT NULL, $\r\n$ Title NVARCHAR(30),\r\n ReportsTo INT BirthDate DATETIME,\r\n EGER,\r\n HireDate DATETIME,\r\n Address NV  $ARCHAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Coun PostalCode NVARCHAR(10),\r\n try NVARCHAR(40),\r\n Phone NVARCHAR(2 Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) N LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(8 OT NULL,\r\n 0),\r\n Address NVARCHAR(70).\r\n City NVARCHAR(40),\r\n  $CHAR(40), \r\n$ Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHAR(24),\r\n Phone NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFEREN CES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION \r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON "customers" (SupportRepId) \n\nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRIMARY KEY AUTOIN CREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DA TETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingCity NVA BillingState NVARCHAR(40),\r\n BillingCountry NVARCHAR  $RCHAR(40), \r\n$  $(40), \r\n$ BillingPostalCode NVARCHAR(10),\r\n Total NUMERIC(10,2) NOT FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r NULL,\r\n \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL items"\r\n(\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n  $L,\r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "trac ks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT N TABLE "artists"\r\n(\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE "tracks" $\r\n(\r\n$ ckId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n Milliseconds INTEGER Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES "genr es" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n N KEY (MediaTypeId) REFERENCES "media types" (MediaTypeId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n mId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) R

EFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTI ON\r\n)\n\nCREATE TABLE sglite stat1(tbl,idx,stat)\n\n\n===Additional Contex In the \'customers\' table, address column names do not have \'B illing\' prefix, \n e.g. country column name is \'country\', not \'Billin \n\nIn the chinook database invoice means order\n\n===Respon gCountry\'\n se Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provi ded context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find th e distinct strings in that column. Prepend the guery with a comment saying i ntermediate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'Get the t otal number of invoices for each customer'}, {'role': 'assistant', 'conten t': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS Tot alInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId \nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'conten t': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Total \nFROM invoices \nWHERE Inv oiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'Find the total numb er of invoices per country'}, {'role': 'assistant', 'content': 'SELECT c.Cou ntry, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country'}, {'role': 'user', 'cont ent': 'List all albums and their corresponding artist names '}, {'role': 'a ssistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'u ser', 'content': "\n For the question what are the top 5 countries th at customers come from?, \n the generated SQL statement SELECT Billin gCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCount ry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exceptio n [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Custo merCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Customer Count DESC \nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'conten t': 'SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY C ountry \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'conten t': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'rol e': 'user', 'content': 'How many customers are there'}, {'role': 'assistan t', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'conten t': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'as sistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': "\n For the question which table stores c ustomer's orders, \n the generated SQL statement invoices results in the following exception [ERROR-SQL] the generated SQL : invoices\n does not starts with ('select','with') .\n Please fix the error and re-generat "}, {'role': 'assistant', 'content': 'SELECT \* FROM invoi ces'}, {'role': 'user', 'content': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT Track Id, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'co ntent': "List all employees and their reporting manager's name (if any):"}]

[Ollama parameters]

model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK EmployeeReportsTo ON \"employees\" (Repo rtsTo)\n\nCREATE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n irstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo BirthDate DATETIME,\r\n HireDate DATETIME.\r\n INTEGER,\r\n Address  $NVARCHAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n untry NVARCHAR(40),\r\n Phone NVARCHAR(2 4),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTIO N ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n Custome rId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL.\r\n FirstName NVARCHAR(4 0) NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHA Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n  $R(80), \r\n$ State N  $VARCHAR(40), \r\n$ Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REF ERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (Suppo rtRepId)\n\nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER PRIMARY CustomerId INTEGER NOT NULL,\r\n KEY AUTOINCREMENT NOT NULL,\r\n iceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingState NVARCHAR(40),\r\n ngCity NVARCHAR(40),\r\n BillingCountry BillingPostalCode NVARCHAR(10),\r\n  $NVARCHAR(40), \r\n$ Total NUMERIC(1 0,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (Cu stomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TAB InvoiceLineId INTEGER PRIMARY KEY AUTOINCRE LE \"invoice items\"\r\n(\r\n MENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER N OT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) NOT NULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"artists\"\r\n(\r\n ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE TABLE TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r \"tracks\"\r\n(\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n Id INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(22 0), r nMilliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n FOREIGN KEY (AlbumId) REFERENCES \"alb Price NUMERIC(10,2) NOT NULL,\r\n ums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n IGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTIO N ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES \"media t ypes\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n \nCREATE TABLE \"albums\"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREM Title NVARCHAR(160) NOT NULL,\r\n ENT NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE sqlite st atl(tbl,idx,stat)\n\n===Additional Context \n\n\n In the 'customers' ta ble, address column names do not have 'Billing' prefix, \n e.g. country c olumn name is 'country', not 'BillingCountry'\n \n\nIn the chinook databa se invoice means order\n\n===Response Guidelines \n1. If the provided contex t is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requ ires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strings in that column. Prepe nd the query with a comment saying intermediate sql \n3. If the provided con text is insufficient, please explain why it can't be generated. \n4. Please use the most relevant table(s).  $\n$ 5. If the question has been asked and answ ered before, please repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "Get the total number of invoices for each custo mer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invo ices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT Invoi ceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"rol e": "assistant", "content": "SELECT c.Country, COUNT(i.InvoiceId) AS TotalIn voices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGR OUP BY c.Country"}, {"role": "user", "content": "List all albums and their c orresponding artist names "}, {"role": "assistant", "content": "SELECT a.Ti tle AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar 0 N a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "\n question what are the top 5 countries that customers come from?, \n he generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "List all invoices with a total exceeding \$10"}, {"role": "assistant", "content": "SELECT InvoiceId, Total FROM invoic es WHERE Total > 10"}, {"role": "user", "content": "How many customers are t here"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "Can you list all tables in the SQLite database catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "\n ion which table stores customer's orders, \n the generated SQL statem ent invoices results in the following exception [ERROR-SQL] the generated SQ L : invoices\n does not starts with ('select','with') .\n "}, {"role": "assistant", "conten the error and re-generate the SQL\n t": "SELECT \* FROM invoices"}, {"role": "user", "content": "Find all tracks with a name containing \"What\" (case-insensitive) "}, {"role": "assistant", "content": "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%wha t%'"}, {"role": "user", "content": "List all employees and their reporting m anager's name (if any):"}]

FROM employees e1

**LEFT JOIN** employees e2 **ON** e1.ReportsTo = e2.EmployeeId

[( DATA )]
queried data frame

	EmployeeId	EmployeeName	ManagerName
0	1	Andrew Adams	None
1	2	Nancy Edwards	Andrew Adams
2	3	Jane Peacock	Nancy Edwards
3	4	Margaret Park	Nancy Edwards
4	5	Steve Johnson	Nancy Edwards
5	6	Michael Mitchell	Andrew Adams
6	7	Robert King	Michael Mitchell
7	8	Laura Callahan	Michael Mitchell

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Li
 st all employees and their reporting manager's name (if any):\\n\nThe DataFr
ame was produced using this query: SELECT el.EmployeeId, el.FirstName || ' '
 || e1.LastName AS EmployeeName, \n
 COALESCE(e2.FirstName | | ' ' | | e2.
LastName, 'None') AS ManagerName \nFROM employees e1 \nLEFT JOIN employees e
 2 ON el.ReportsTo = e2.EmployeeId\n\nThe following is information about the
 resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n EmployeeId
 int64\nEmployeeName
 object\nManagerName
 object\ndtype: object"}, {"ro
 le": "user", "content": "Can you generate the Python plotly code to chart th
e results of the dataframe? Assume the data is in a pandas dataframe called
 'df'. If there is only one value in the dataframe, use an Indicator. Respond
with only Python code. Do not answer with any explanations -- just the cod
e."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:03:26.197317355Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\nim
 port plotly.figure factory as ff\n\nif len(df) == 1:\n
 fiq = qo.Fiqure(q
 o.Indicator(mode="text", value=df[\'EmployeeName\'].iloc[0], text=df[\'Manaq
erName\'].iloc[0]))\nelse:\n
 fig = ff.create table(df)\n
 ()'}, 'done reason': 'stop', 'done': True, 'total duration': 40969431107, 'l
 oad duration': 12212825, 'prompt eval count': 220, 'prompt eval duration': 1
8565716000, 'eval count': 72, 'eval duration': 22345310000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
import plotly.figure factory as ff
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="text", value=df['EmployeeName'].iloc[0], text=df['Man
agerName'].iloc[0]))
else:
 fig = ff.create table(df)
```

Employeeld	EmployeeName	ManagerName
1	Andrew Adams	None
2	Nancy Edwards	Andrew Adams
3	Jane Peacock	Nancy Edwards
4	Margaret Park	Nancy Edwards
5	Steve Johnson	Nancy Edwards
6	Michael Mitchell	Andrew Adams
7	Robert King	Michael Mitchell
8	Laura Callahan	Michael Mitchell

Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

\_\_\_\_\_\_

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# QUESTION - 13: Get the average invoice total for each customer:

\_\_\_\_\_

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## [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL.\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER FOREIGN KEY (CustomerId) REFERENCES "customers" IC(10,2) NOT NULL,\r\n (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE INDEX IFK I nvoiceLineInvoiceId ON "invoice\_items" (InvoiceId)\n\nCREATE TABLE "invoice\_ InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL  $items"\r\n(\r\n$ InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "trac ks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE TABLE sq lite stat1(tbl,idx,stat)\n\nCREATE INDEX IFK CustomerSupportRepId ON "custom ers" (SupportRepId)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEG ER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NU LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n City NVARCHAR(40),\r\n Address NVARCHAR(70),\r\n State NVARCHAR(40),\r Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVA  $RCHAR(24), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employee s" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREA TE INDEX IFK EmployeeReportsTo ON "employees" (ReportsTo)\n\nCREATE TABLE "e mployees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL  $L,\r\n$ LastName NVARCHAR(20) NOT NULL, $\r\n$ FirstName NVARCHAR(20) NO T NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n e DATETIME,\r\n State NVARCHAR(40),\r\n ty NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n Phone NVARCHAR(24),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "em 4),\r\n ployees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n \n\n===Additional Context \n\nIn the chinook database invoice means order\n In the \'customers\' table, address column names do not have \'Billi ng\' prefix, \n e.g. country column name is \'country\', not \'BillingCou \n\n===Response Guidelines \n1. If the provided context is suffi cient, please generate a valid SQL query without any explanations for the qu estion. \n2. If the provided context is almost sufficient but requires knowl edge of a specific string in a particular column, please generate an interme diate SQL query to find the distinct strings in that column. Prepend the que ry with a comment saying intermediate sql \n3. If the provided context is in sufficient, please explain why it can\'t be generated. \n4. Please use the m ost relevant table(s). \n5. If the question has been asked and answered befo

re, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastNa me, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i 0 N c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastNam e'}, {'role': 'user', 'content': 'Find the total number of invoices per coun try'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceI d) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.C ustomerId\nGROUP BY c.Country'}, {'role': 'user', 'content': 'List all invoi ces with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT I nvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'conten t': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Total \nFROM invoices \nWHERE Inv oiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM customer s'}, {'role': 'user', 'content': "\n For the question which table sto res customer's orders, \n the generated SQL statement invoices result s in the following exception [ERROR-SQL] the generated SQL : invoices\n does not starts with ('select','with') .\n Please fix the error and re-gen "}, {'role': 'assistant', 'content': 'SELECT \* FROM i erate the SQL\n nvoices'}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL s tatement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCoun try, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \n ORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT Bill ingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCou ntry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: BillingCountr y .\n Please fix the error and re-generate the SQL\n "}, {'rol e': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCount \nFRO M customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'content': "List all employees and their reporting manage r's name (if any):"}, {'role': 'assistant', 'content': "SELECT el.EmployeeI d, e1.FirstName || ' ' || e1.LastName AS EmployeeName, \n COALESCE(e2. FirstName || ' ' || e2.LastName, 'None') AS ManagerName \nFROM employees e1 \nLEFT JOIN employees e2 ON e1.ReportsTo = e2.EmployeeId"}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'rol e': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS Artist Name \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'rol e': 'user', 'content': 'Find all tracks with a name containing "What" (caseinsensitive) '}, {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}]

```
[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None
```

[( Prompt Content )]
[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructions. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P

RIMARY KEY AUTOINCREMENT NOT NULL,\r\n Customerid INTEGER NOT NULL,\r\n

InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId)  $\r \n \t \0$  DELETE NO ACTION ON UPDATE NO ACTION $\r \n \n \$ INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"inv oice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NUL NULL,\r\n  $L,\r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NU  $LL,\r\n$ FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) RE FERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO N\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId) \n\nCREATE TABLE sqlite stat1(tbl,idx,stat)\n\nCREATE INDEX IFK CustomerSupp ortRepId ON \"customers\" (SupportRepId)\n\nCREATE TABLE \"customers\"\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(4 Company NVARCHAR(80),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n e NVARCHAR(10),\r\n mail NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO AC TION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK EmployeeReportsTo ON \"emp loyees\" (ReportsTo)\n\nCREATE TABLE \"employees\"\r\n(\r\n EmployeeId IN TEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT FirstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n HireDate DATETIM \n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n E, r nState NVARC Country NVARCHAR(40),\r\n  $HAR(40), \r\n$ PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DEL ETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n\n In the 'customers' table, addr ess column names do not have 'Billing' prefix, \n e.g. country column nam e is 'country', not 'BillingCountry'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL guery withou t any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular colum n, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. I f the provided context is insufficient, please explain why it can't be gener ated. \n4. Please use the most relevant table(s). \n5. If the question has b een asked and answered before, please repeat the answer exactly as it was gi ven before. \n"}, {"role": "user", "content": "Get the total number of invoi ces for each customer"}, {"role": "assistant", "content": "SELECT c.Customer Id, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM custo mers c\nJ0IN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerI d, c.FirstName, c.LastName"}, {"role": "user", "content": "Find the total nu mber of invoices per country"}, {"role": "assistant", "content": "SELECT c.C ountry, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "co ntent": "List all invoices with a total exceeding \$10"}, {"role": "assistan t", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"role": "user", "content": "Find all invoices since 2010 and the total amou nt invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Total \n

FROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "conte nt": "How many customers are there"}, {"role": "assistant", "content": "SELE CT COUNT(\*) FROM customers"}, {"role": "user", "content": "\n question which table stores customer's orders, \n the generated SQL s tatement invoices results in the following exception [ERROR-SQL] the generat ed SQL : invoices\n does not starts with ('select', 'with') .\n fix the error and re-generate the SQL\n "}, {"role": "assistant", "co ntent": "SELECT \* FROM invoices"}, {"role": "user", "content": "\n r the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "List all employees and their reporting m anager's name (if any):"}, {"role": "assistant", "content": "SELECT e1.Emplo yeeId, e1.FirstName || ' ' || e1.LastName AS EmployeeName, \n (e2.FirstName || ' ' || e2.LastName, 'None') AS ManagerName \nFROM employees el \nLEFT JOIN employees e2 ON el.ReportsTo = e2.EmployeeId"}, {"role": "use r", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, ar.Name AS A rtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all tracks with a name containing \"What\" (case-insensitive) "}, {"role": "assistant", "content": "SELECT TrackId, Nam e FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": " Get the average invoice total for each customer:"}] [( Ollama Response )] {'model': 'gwen2.5:14b', 'created at': '2024-10-13T00:06:37.580091661Z', 'me ssage': {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJ0IN invo ices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, 'done reason': 'stop', 'done': True, 'total duration': 1912429 12045, 'load\_duration': 11432972, 'prompt\_eval\_count': 1526, 'prompt\_eval\_du ration': 172660714000, 'eval count': 48, 'eval duration': 16870680000} [( LLM Response )] SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoice Total

c.LastName'}, 'done\_reason': 'stop', 'done': True, 'total\_duration': 1912
12045, 'load\_duration': 11432972, 'prompt\_eval\_count': 1526, 'prompt\_eval
ration': 172660714000, 'eval\_count': 48, 'eval\_duration': 16870680000}

[( LLM Response )]
SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvo
Total
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.CustomerId, c.FirstName, c.LastName

[( SQL )]
generated SQL statement

SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal
FROM customers c

JOIN invoices i ON c.CustomerId = i.CustomerId

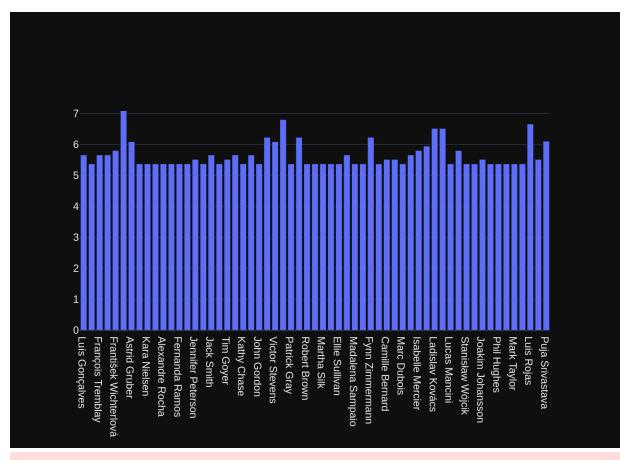
**GROUP BY c.**Customerld, **c.**FirstName, **c.**LastName

[( DATA )]
queried data frame

	CustomerId	FirstName	LastName	AverageInvoiceTotal
0	1	Luís	Gonçalves	5.660000
1	2	Leonie	Köhler	5.374286
2	3	François	Tremblay	5.660000
3	4	Bjørn	Hansen	5.660000
4	5	František	Wichterlová	5.802857
5	6	Helena	Holý	7.088571
6	7	Astrid	Gruber	6.088571
7	8	Daan	Peeters	5.374286
8	9	Кага	Nielsen	5.374286
9	10	Eduardo	Martins	5.374286
10	11	Alexandre	Rocha	5.374286
11	12	Roberto	Almeida	5.374286
12	13	Fernanda	Ramos	5.374286
13	14	Mark	Philips	5.374286
14	15	Jennifer	Peterson	5.517143
15	16	Frank	Harris	5.374286
16	17	Jack	Smith	5.660000
17	18	Michelle	Brooks	5.374286
18	19	Tim	Goyer	5.517143
19	20	Dan	Miller	5.660000
20	21	Kathy	Chase	5.374286
21	22	Heather	Leacock	5.660000
22	23	John	Gordon	5.374286
23	24	Frank	Ralston	6.231429
24	25	Victor	Stevens	6.088571
25	26	Richard	Cunningham	6.802857
26	27	Patrick	Gray	5.374286
27	28	Julia	Barnett	6.231429
28	29	Robert	Brown	5.374286
29	30	Edward	Francis	5.374286
30	31	Martha	Silk	5.374286
31	32	Aaron	Mitchell	5.374286
32	33	Ellie	Sullivan	5.374286
33	34	João	Fernandes	5.660000

	CustomerId	FirstName	LastName	AverageInvoiceTotal
34	35	Madalena	Sampaio	5.374286
35	36	Hannah	Schneider	5.374286
36	37	Fynn	Zimmermann	6.231429
37	38	Niklas	Schröder	5.374286
38	39	Camille	Bernard	5.517143
39	40	Dominique	Lefebvre	5.517143
40	41	Магс	Dubois	5.374286
41	42	Wyatt	Girard	5.660000
42	43	Isabelle	Mercier	5.802857
43	44	Terhi	Hämäläinen	5.945714
44	45	Ladislav	Kovács	6.517143
45	46	Hugh	O'Reilly	6.517143
46	47	Lucas	Mancini	5.374286
47	48	Johannes	Van der Berg	5.802857
48	49	Stanisław	Wójcik	5.374286
49	50	Enrique	Muñoz	5.374286
50	51	Joakim	Johansson	5.517143
51	52	Emma	Jones	5.374286
52	53	Phil	Hughes	5.374286
53	54	Steve	Миггау	5.374286
54	55	Mark	Taylor	5.374286
55	56	Diego	Gutiérrez	5.374286
56	57	Luis	Rojas	6.660000
57	58	Manoj	Pareek	5.517143
58	59	Puja	Srivastava	6.106667

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: ' G
 et the average invoice total for each customer:'\n\nThe DataFrame was produc
ed using this query: SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Tot
 al) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerI
 d = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\n\nThe foll
 owing is information about the resulting pandas DataFrame 'df': \nRunning d
 f.dtypes gives:\n CustomerId
 int64\nFirstName
 ject\nLastName
 object\nAverageInvoiceTotal
 float64\ndtype:
 object"}, {"role": "user", "content": "Can you generate the Python plotly co
de to chart the results of the dataframe? Assume the data is in a pandas dat
 aframe called 'df'. If there is only one value in the dataframe, use an Indi
 cator. Respond with only Python code. Do not answer with any explanations --
 just the code."}]
 [(Ollama Response)]
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 ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\n\n
 if len(df) == 1:\n
 fig = go.Figure(go.Indicator(mode="number", value=df
 [\'AverageInvoiceTotal\'].iloc[0]))\nelse:\n
 fig = go.Figure([go.Bar(x=df
 [\'FirstName\'] + \' \' + df[\'LastName\'], y=df[\'AverageInvoiceTotal\'])])
 \nfig.show()'}, 'done reason': 'stop', 'done': True, 'total duration': 40466
 546836, 'load duration': 10630849, 'prompt eval count': 205, 'prompt eval du
 ration': 17115270000, 'eval count': 76, 'eval duration': 23212296000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['AverageInvoiceTotal'].iloc[0]))
else:
 fig = go.Figure([go.Bar(x=df['FirstName'] + ' ' + df['LastName'], y=df['AverageInvoiceTota
l'])])
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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# QUESTION - 14: Find the top 5 most expensive tracks (based on unit pric
e):

\_\_\_\_\_\_

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[( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n mId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT E NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackAlbumId ON "tracks" (AlbumId)\n \nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n\nCREATE INDEX IFK Pl aylistTrackTrackId ON "playlist track" (TrackId)\n\nCREATE INDEX IFK Invoice LineTrackId ON "invoice\_items" (TrackId)\n\nCREATE INDEX IFK TrackMediaTypeI d ON "tracks" (MediaTypeId)\n\nCREATE TABLE "invoice items"\r\n(\r\n iceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEG ER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10, 2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (Invoice Id) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t \tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlist tra  $ck"\r\n(\r\n$ PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NU CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r  $LL,\r\n$ FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\t0 N DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFEREN CES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)\n\nCREATE TABLE "a  $lbums"\r\n(\r\n$ AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n EIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\t0N DELETE NO ACT ION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook d In the \'customers\' table, address col atabase invoice means order\n\n\n umn names do not have \'Billing\' prefix, \n e.g. country column name is \'country\', not \'BillingCountry\'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query withou t any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular colum n, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. I f the provided context is insufficient, please explain why it can\'t be gene rated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was g iven before. \n'}, {'role': 'user', 'content': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "S ELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role':

'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'List all albums and their corresponding a rtist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS AlbumTi tle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': ' Get the average invoice total f or each customer:'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c. FirstName, c.LastName'}, {'role': 'user', 'content': 'Find all invoices sinc e 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "S ELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-0 1'"}, {'role': 'user', 'content': 'Find the total number of invoices per cou ntry'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceI d) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.C ustomerId\nGROUP BY c.Country'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SE LECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoi ces\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'c ontent': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (ba sed on unit price):'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMA RY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n lbumId INTEGER.\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n R, r nBytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPD FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) ATE NO ACTION,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTy peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION 0 N UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackAlbumId ON \"tracks\" (Albu mId)\n\nCREATE INDEX IFK TrackGenreId ON \"tracks\" (GenreId)\n\nCREATE INDE X IFK PlaylistTrackTrackId ON \"playlist track\" (TrackId)\n\nCREATE INDEX I FK InvoiceLineTrackId ON \"invoice items\" (TrackId)\n\nCREATE INDEX IFK Tra ckMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCREATE TABLE \"invoice items \"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n ice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREI GN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES \"tracks \" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlist track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n ackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY aylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (Artis tId)\n\nCREATE TABLE \"albums\"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTO INCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n TEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artists\" (Artis tId)  $\r \n \t \0$  DELETE NO ACTION ON UPDATE NO ACTION $\r \n \n \===Additional$ Context \n\nIn the chinook database invoice means order\n\n\n tomers' table, address column names do not have 'Billing' prefix, \n e.g. country column name is 'country', not 'BillingCountry'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a val id SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the d istinct strings in that column. Prepend the query with a comment saying inte rmediate sql \n3. If the provided context is insufficient, please explain wh y it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer ex actly as it was given before. \n"}, {"role": "user", "content": "Find all tr acks with a name containing \"What\" (case-insensitive) "}, {"role": "assist ant", "content": "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '% what%'"}, {"role": "user", "content": "List all invoices with a total exceed ing \$10"}, {"role": "assistant", "content": "SELECT InvoiceId, Total FROM in voices WHERE Total > 10"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELE CT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artis ts ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": " Get the a verage invoice total for each customer:"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoic eTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGR OUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "as sistant", "content": "SELECT InvoiceId, Total \nFROM invoices \nWHERE Invoic eDate >= '2010-01-01'"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": "SELECT c.Countr y, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "conten t": "Get the total number of invoices for each customer"}, {"role": "assista nt", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.Invoi ceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "us er", "content": "Can you list all tables in the SQLite database catalog?"},

{"role": "assistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": For the guestion what are the top 5 countries "user", "content": "\n that customers come from?, \n the generated SQL statement SELECT Bill ingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCou ntry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following except ion [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Cus tomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCou nt DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Custo merCount DESC \nLIMIT 5': no such column: BillingCountry .\n ix the error and re-generate the SOL\n "}, {"role": "assistant", "con tent": "SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP B Y Country \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "user", "conte nt": "Find the top 5 most expensive tracks (based on unit price):"}]

[( Ollama Response )]

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ssage': {'role': 'assistant', 'content': 'SELECT TrackId, Name, UnitPrice \n
FROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, 'done\_reason': 'stop', 'd
one': True, 'total\_duration': 159431217528, 'load\_duration': 13083517, 'prom
pt\_eval\_count': 1371, 'prompt\_eval\_duration': 150324079000, 'eval\_count': 2
2, 'eval\_duration': 7440719000}

[( LLM Response )]
SELECT TrackId, Name, UnitPrice
FROM tracks
ORDER BY UnitPrice DESC
LIMIT 5

[( SQL )]

generated SQL statement

**SELECT** TrackId, Name, UnitPrice

FROM tracks

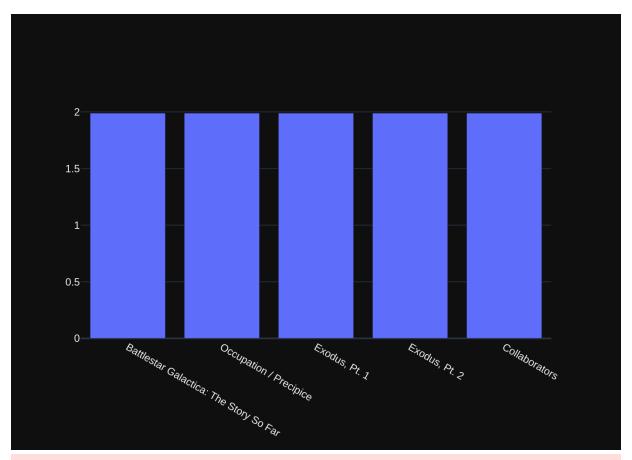
**ORDER BY UnitPrice DESC** 

LIMIT 5

[( DATA )]
queried data frame

	TrackId	Name	UnitPrice
0	2819	Battlestar Galactica: The Story So Far	1.99
1	2820	Occupation / Precipice	1.99
2	2821	Exodus, Pt. 1	1.99
3	2822	Exodus, Pt. 2	1.99
4	2823	Collaborators	1.99

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Fi
 nd the top 5 most expensive tracks (based on unit price):'\n\nThe DataFrame
was produced using this query: SELECT TrackId, Name, UnitPrice \nFROM tracks
 \nORDER BY UnitPrice DESC \nLIMIT 5\n\nThe following is information about th
e resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n TrackId
 object\nUnitPrice
 float64\ndtype: object"}, {"role":
 int64\nName
 "user", "content": "Can you generate the Python plotly code to chart the res
 ults of the dataframe? Assume the data is in a pandas dataframe called 'df'.
 If there is only one value in the dataframe, use an Indicator. Respond with
only Python code. Do not answer with any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created_at': '2024-10-13T00:10:32.65555734Z', 'mes
 sage': {'role': 'assistant', 'content': "import plotly.graph objs as go\nif
 len(df) == 1:\n fig = qo.Figure(go.Indicator(mode='number', value=df['Uni
 tPrice'].values[0]))\nelse:\n
 fig = go.Figure([go.Bar(x=df['Name'], y=df
 ['UnitPrice'])])\nfig.show()"}, 'done reason': 'stop', 'done': True, 'total
duration': 35016760365, 'load duration': 10415415, 'prompt eval count': 179,
 'prompt eval duration': 14705884000, 'eval count': 66, 'eval duration': 2016
7916000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode='number', value=df['UnitPrice'].values[0]))
 fig = go.Figure([go.Bar(x=df['Name'], y=df['UnitPrice'])])
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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# QUESTION - 15: List all genres and the number of tracks in each genre:

\_\_\_\_\_

====

## [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n mId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Bytes INTEGER,\r\n FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n E NO ACTION,\r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n \nCREATE TABLE "genres"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMEN Name NVARCHAR(120) $\r\n)\n$ CREATE INDEX IFK PlaylistTrack T NOT NULL,\r\n TrackId ON "playlist track" (TrackId)\n\nCREATE INDEX IFK TrackAlbumId ON "t racks" (AlbumId)\n\nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK TrackMediaTypeId ON "tracks" (MediaTypeId)\n\nCREATE TABLE "playli st track"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, Track NOT NULL,\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO N\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTO INCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId IN TEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistI d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)\n\n===Additional Context \n\nIn the c hinook database invoice means order\n\n In the \'customers\' table, add ress column names do not have \'Billing\' prefix, \n e.g. country column name is \'country\', not \'BillingCountry\'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL quer y without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particula r column, please generate an intermediate SQL query to find the distinct str ings in that column. Prepend the query with a comment saying intermediate sq l \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the questi on has been asked and answered before, please repeat the answer exactly as i t was given before.  $\n'$ }, {'role': 'user', 'content': 'Find the top 5 most e xpensive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nL IMIT 5'}, {'role': 'user', 'content': 'List all albums and their correspondi ng artist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS Alb umTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.Artist Id = ar.ArtistId'}, {'role': 'user', 'content': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "S

ELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'rol e': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalIn voices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGR OUP BY c.Country'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT nam e FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'Li st all invoices with a total exceeding \$10'}, {'role': 'assistant', 'conten t': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'use r', 'content': 'Get the total number of invoices for each customer'}, {'rol e': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, C OUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.C ustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amou nt invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Total \n FROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'conte nt': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELE CT COUNT(\*) FROM customers'}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\n FROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'List a ll genres and the number of tracks in each genre:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep\_alive=None

### [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMA RY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n lbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Bytes INTEGER,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTy peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O N UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackGenreId ON \"tracks\" (Genr eId)\n\nCREATE TABLE \"genres\"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTO INCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK Playl istTrackTrackId ON \"playlist track\" (TrackId)\n\nCREATE INDEX IFK TrackAlb umId ON \"tracks\" (AlbumId)\n\nCREATE TABLE \"playlists\"\r\n(\r\n istId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120) \r\n)\n\nCREATE INDEX IFK TrackMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCR EATE TABLE \"playlist track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY FOREIGN KEY (PlaylistId) REFERENCES \"playlist (PlaylistId, TrackId),\r\n s\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n EIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\t0N DELETE NO ACTI ON ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"albums\"\r\n(\r\n NTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT N

ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERE NCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION \r\n)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (ArtistId)\n\n===Add itional Context \n\nIn the chinook database invoice means order\n\n\n the 'customers' table, address column names do not have 'Billing' prefix, \n e.g. country column name is 'country', not 'BillingCountry'\n n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the pro vided context is almost sufficient but requires knowledge of a specific stri ng in a particular column, please generate an intermediate SQL guery to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explai n why it can't be generated. \n4. Please use the most relevant table(s). \n 5. If the question has been asked and answered before, please repeat the ans wer exactly as it was given before. \n"}, {"role": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistan t", "content": "SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY Uni tPrice DESC \nLIMIT 5"}, {"role": "user", "content": "List all albums and th eir corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all trac ks with a name containing \"What\" (case-insensitive) "}, {"role": "assistan t", "content": "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%wh at%'"}, {"role": "user", "content": "Find the total number of invoices per c ountry"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.Invoic eId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content": "Can you lis t all tables in the SQLite database catalog?"}, {"role": "assistant", "conte nt": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "use r", "content": "List all invoices with a total exceeding \$10"}, {"role": "as sistant", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 1 0"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstNa me, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstNam e, c.LastName"}, {"role": "user", "content": "Find all invoices since 2010 a nd the total amount invoiced:"}, {"role": "assistant", "content": "SELECT In voiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"rol e": "user", "content": "How many customers are there"}, {"role": "assistan t", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "conten t": " Get the average invoice total for each customer:"}, {"role": "assistan t", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) A S AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "us er", "content": "List all genres and the number of tracks in each genre:"}]

{'model': 'qwen2.5:14b', 'created\_at': '2024-10-13T00:12:50.540476796Z', 'me
ssage': {'role': 'assistant', 'content': 'SELECT g.Name AS GenreName, COUNT
(t.TrackId) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId =
t.GenreId\nGROUP BY g.Name'}, 'done\_reason': 'stop', 'done': True, 'total\_du
ration': 137795560710, 'load\_duration': 10677076, 'prompt\_eval\_count': 1161,
'prompt eval duration': 123040277000, 'eval count': 39, 'eval duration': 131

15316000}

[( LLM Response )]

[( Ollama Response )]

```
SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks
FROM genres g
JOIN tracks t ON g.GenreId = t.GenreId
GROUP BY g.Name

[(SQL)]
generated SQL statement

SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks
FROM genres g
JOIN tracks t ON g.GenreId = t.GenreId
GROUP BY g.Name

[(DATA)]
queried data frame
```

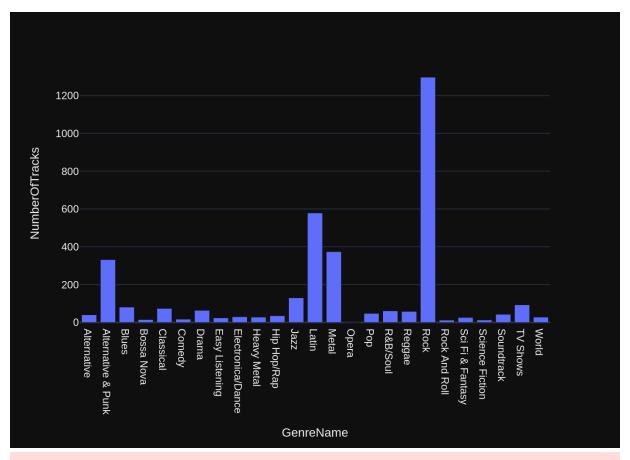
	GenreName	NumberOfTracks
0	Alternative	40
1	Alternative & Punk	332
2	Blues	81
3	Bossa Nova	15
4	Classical	74
5	Comedy	17
6	Drama	64
7	Easy Listening	24
8	Electronica/Dance	30
9	Heavy Metal	28
10	Hip Hop/Rap	35
11	Jazz	130
12	Latin	579
13	Metal	374
14	Opera	1
15	Рор	48
16	R&B/Soul	61
17	Reggae	58
18	Rock	1297
19	Rock And Roll	12
20	Sci Fi & Fantasy	26
21	Science Fiction	13
22	Soundtrack	43
23	TV Shows	93
24	World	28

```
[Ollama parameters]
model=gwen2.5:14b,
options={},
keep alive=None
[(Prompt Content)]
[{"role": "system", "content": "The following is a pandas DataFrame that con
tains the results of the query that answers the question the user asked: 'Li
st all genres and the number of tracks in each genre:'\n\nThe DataFrame was
produced using this query: SELECT q.Name AS GenreName, COUNT(t.TrackId) AS N
umberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP
BY g.Name\n\nThe following is information about the resulting pandas DataFra
me 'df': \nRunning df.dtypes gives:\n GenreName
 object\nNumberOfTrac
 int64\ndtype: object"}, {"role": "user", "content": "Can you generate
the Python plotly code to chart the results of the dataframe? Assume the dat
a is in a pandas dataframe called 'df'. If there is only one value in the da
taframe, use an Indicator. Respond with only Python code. Do not answer with
any explanations -- just the code."}]
[(Ollama Response)]
{'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:13:27.763475332Z', 'me
ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\nim
port plotly.io as pio\n\nif len(df) == 1:\n fig = go.Figure(go.Indicator
(mode="number", value=df[\'NumberOfTracks\'].values[0]))\nelse:\n
x.bar(df, x=\'GenreName\', y=\'NumberOfTracks\')\n\npio.show(fig)'}, 'done r
eason': 'stop', 'done': True, 'total duration': 37193200691, 'load duratio
n': 10767998, 'prompt_eval_count': 188, 'prompt_eval_duration': 15485035000,
'eval count': 71, 'eval duration': 21565869000}
```

```
1200
```

```
[(PYTHON)]
generated Plotly code
import plotly.graph_objs as go
import plotly.io as pio

if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['NumberOfTracks'].values[0]))
else:
 fig = px.bar(df, x='GenreName', y='NumberOfTracks')
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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# QUESTION - 16: Get all genres that do not have any tracks associated with them:

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### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons.  $\n===Tables \nCREATE INDEX IFK\_TrackGenreId ON "tracks" (GenreId)\n\nCR$ EATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NO T NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARC  $HAR(220), \r\n$ Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n OREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTI ON ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media t ypes" (MediaTypeId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n CREATE INDEX IFK PlaylistTrackTrackId ON "playlist track" (TrackId)\n\nCREAT E INDEX IFK TrackMediaTypeId ON "tracks" (MediaTypeId)\n\nCREATE INDEX IFK T rackAlbumId ON "tracks" (AlbumId)\n\nCREATE TABLE "genres"\r\n(\r\n Id INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r  $\n)\n\n\CREATE TABLE "albums"\r\n(\r\n$ AlbumId INTEGER PRIMARY KEY AUTOINC REMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEG FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) ER NOT NULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playli PlaylistId INTEGER NOT NULL,\r\n st track"\r\n(\r\n TrackId INTEGER CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, Track NOT NULL,\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO N\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)\n\nCREATE TA PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT BLE "playlists"\r\n(\r\n Name NVARCHAR(120)\r\n)\n\n===Additional Context  $\n\n\$ NULL,\r\n the \'customers\' table, address column names do not have \'Billing\' prefi e.g. country column name is \'country\', not \'BillingCountry\'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n 1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is a lmost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strin gs in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can\'t b e generated. \n4. Please use the most relevant table(s). \n5. If the questio n has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'List all genres and the number of tracks in each genre:'}, {'role': 'assistant', 'content': 'SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.Name'}, {'role': 'user', 'cont ent': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks WHERE LOW ER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'List all albums and t heir corresponding artist names '}, {'role': 'assistant', 'content': 'SELEC T a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artist s ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'Find the to p 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'c ontent': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, {'role': 'user', 'content': 'Can you list all tables in th e SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite\_master WHERE type = 'table'"}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistan t', 'content': "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'List all invoices with a tot al exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Tota l FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': "List all em ployees and their reporting manager's name (if any):"}, {'role': 'assistan t', 'content': "SELECT el.EmployeeId, el.FirstName || ' ' || el.LastName AS COALESCE(e2.FirstName || ' ' || e2.LastName, 'None') EmployeeName, \n AS ManagerName \nFROM employees e1 \nLEFT JOIN employees e2 ON e1.ReportsTo = e2.EmployeeId"}, {'role': 'user', 'content': 'Find the total number of inv oices per country'}, {'role': 'assistant', 'content': 'SELECT c.Country, COU NT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.Cus tomerId = i.CustomerId\nGROUP BY c.Country'}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}, {'role': 'assistant', 'c ontent': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS Aver ageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Custo merId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'c ontent': 'Get all genres that do not have any tracks associated with the m:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

# [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK TrackGenreId ON \"tracks\" (GenreId)\n\n CREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMEN Name NVARCHAR(200) NOT NULL,\r\n T NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARC Bytes INTEGER,\r\n Milliseconds INTEGER NOT NULL,\r\n  $HAR(220), \r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\t0N DELETE NO A FOREIGN KEY (MediaTypeId) REFERENCES \"med CTION ON UPDATE NO ACTION,\r\n ia types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE INDEX IFK PlaylistTrackTrackId ON \"playlist track\" (TrackId) \n\nCREATE INDEX IFK TrackMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCREATE INDEX IFK TrackAlbumId ON \"tracks\" (AlbumId)\n\nCREATE TABLE \"genres\"\r GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $n(\r\n$  $VARCHAR(120)\r\n)\nCREATE TABLE \"albums\"\r\n(\r\n$ AlbumId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artis ts\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREA TE TABLE \"playlist track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n

TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlist s\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n EIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\t0N DELETE NO ACTI ON ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (ArtistId)\n\nCREATE TABLE \"playlists\"\r\n(\r\n PlavlistId INTEGER PRIM ARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\n===Addit$ In the 'customers' table, address column names do no ional Context \n\n\n e.g. country column name is 'country', not 'B t have 'Billing' prefix, \n illingCountry'\n \n\nIn the chinook database invoice means order\n\n===Re sponse Guidelines \n1. If the provided context is sufficient, please generat e a valid SQL query without any explanations for the question. \n2. If the p rovided context is almost sufficient but requires knowledge of a specific st ring in a particular column, please generate an intermediate SQL query to fi nd the distinct strings in that column. Prepend the query with a comment say ing intermediate sql \n3. If the provided context is insufficient, please ex plain why it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the a nswer exactly as it was given before. \n"}, {"role": "user", "content": "Lis t all genres and the number of tracks in each genre:"}, {"role": "assistan t", "content": "SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTrac ks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.Nam e"}, {"role": "user", "content": "Find all tracks with a name containing \"W hat\" (case-insensitive) "}, {"role": "assistant", "content": "SELECT TrackI d, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "con tent": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "u ser", "content": "Find the top 5 most expensive tracks (based on unit pric e):"}, {"role": "assistant", "content": "SELECT TrackId, Name, UnitPrice \nF ROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "conten t": "Can you list all tables in the SQLite database catalog?"}, {"role": "as sistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "Find all invoices since 2010 and the total amou nt invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Total \n FROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "conte nt": "List all invoices with a total exceeding \$10"}, {"role": "assistant", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"rol e": "user", "content": "List all employees and their reporting manager's nam e (if any):"}, {"role": "assistant", "content": "SELECT el.EmployeeId, el.Fi rstName || ' ' || el.LastName AS EmployeeName, \n COALESCE(e2.FirstNam e || ' ' || e2.LastName, 'None') AS ManagerName \nFROM employees e1 \nLEFT J OIN employees e2 ON e1.ReportsTo = e2.EmployeeId"}, {"role": "user", "conten t": "Find the total number of invoices per country"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM cust omers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Countr y"}, {"role": "user", "content": " Get the average invoice total for each cu stomer:"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstNam e, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN i nvoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstNam e, c.LastName"}, {"role": "user", "content": "Get all genres that do not hav e any tracks associated with them:"}]

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[(Ollama Response)]
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```
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 e': True, 'total duration': 138469969604, 'load duration': 9790656, 'prompt
 eval count': 1221, 'prompt eval duration': 130532726000, 'eval count': 19,
 'eval duration': 6292850000}
 [(LLM Response)]
 SELECT Name
 FROM genres
 WHERE GenreId NOT IN (SELECT GenreId FROM tracks)
 [(SQL)]
 generated SQL statement
SELECT Name
FROM genres
WHERE Genreld NOT IN (SELECT Genreld FROM tracks)
 [(DATA)]
 queried data frame
 Name
```

Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

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# QUESTION - 17: List all customers who have not placed any orders:

\_\_\_\_\_

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### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT N OT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(2 Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n 0) NOT NULL,\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r City NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHA Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice items"\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n voiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPric e NUMERIC(10,2) NOT  $NULL,\r\n$  Quantity INTEGER NOT  $NULL,\r\n$ KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTIO N ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (Tra ckid) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NO  $L,\r\n$ T NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n e DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n ty NVARCHAR(40),\r\n Phone NVARCHAR(24),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES "em 4),\r\n ployees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n \nCREATE TABLE "playlist track"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "play lists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\t0N DELETE NO ACT ION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId IN TEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NU ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFEREN CES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE INDEX IFK CustomerSupportRepId ON "customers" (SupportRepId)\n \nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOIN Name NVARCHAR(120) $\r\n)\n\n$ CREATE TABLE "tracks" $\r$ CREMENT NOT NULL,\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $n(\r\n$ VARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n iseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(1 0,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreI d) REFERENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaTypeI d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\n===Additional Context \n\n In the \'customers\' table, address column names do not have \'Billing e.g. country column name is \'country\', not \'BillingCount \n\nIn the chinook database invoice means order\n\n===Response Gui ry\'\n delines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided co ntext is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the dis tinct strings in that column. Prepend the query with a comment saying interm ediate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer ex actly as it was given before. \n'}, {'role': 'user', 'content': 'How many cu stomers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'content': 'Get the total number of invoices f
or each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c. FirstName, c.LastName'}, {'role': 'user', 'content': "\n For the ques tion what are the top 5 countries that customers come from?, \n enerated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFR OM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELEC T BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY Bill ingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP B Y BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: B illingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstN ame, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstNam e, c.LastName'}, {'role': 'user', 'content': 'Find the total number of invoi ces per country'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT (i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.Custo merId = i.CustomerId\nGROUP BY c.Country'}, {'role': 'user', 'content': "Lis t all employees and their reporting manager's name (if any):"}, {'role': 'as sistant', 'content': "SELECT el.EmployeeId, el.FirstName || ' ' || el.LastNa COALESCE(e2.FirstName || ' ' || e2.LastName, 'N me AS EmployeeName, \n one') AS ManagerName \nFROM employees e1 \nLEFT JOIN employees e2 ON e1.Repo rtsTo = e2.EmployeeId"}, {'role': 'user', 'content': 'Find all invoices sinc e 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "S ELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-0 1'"}, {'role': 'user', 'content': "\n For the question which table st ores customer's orders, \n the generated SQL statement invoices resul ts in the following exception [ERROR-SQL] the generated SQL : invoices\n doe s not starts with ('select', 'with') .\n Please fix the error and re-q enerate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'user', 'content': 'List all invoices with a total exce

eding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'List all albums an d their corresponding artist names '}, {'role': 'assistant', 'content': 'SE LECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN art ists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'List all customers who have not placed any orders:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

### [( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL.\r\n BillingAddress NVARCHAR(70).\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou BillingPostalCode NVARCHAR(10),\r\n ntry NVARCHAR(40),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r (20) NOT NULL,\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR  $(40), \r\n$ PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24), $\r\n$ Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEG  $NVARCHAR(24), \r\n$ FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) ER.\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoi InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT N ce items\"\r\n(\r\n ULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NUL  $L \cdot r n$ FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t \tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFE RENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION \r\n)\n\nCREATE TABLE \"employees\"\r\n(\r\n EmployeeId INTEGER PRIMARY K EY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n rstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER.\r\n BirthDate DATETIME,\r\n HireDate DATETIME,\r\n State NVARCHAR(40),\r\n  $NVARCHAR(70), \r\n$ City NVARCHAR(40),\r\n untry NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(2 Fax NVARCHAR(24),\r\n Email NVARCHAR(60),\r\n FOREIGN KEY 4), rn(ReportsTo) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTIO N ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlist track\"\r\n(\r\n TrackId INTEGER NOT NULL.\r\n aylistId INTEGER NOT NULL,\r\n CONSTRA INT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTI FOREIGN KEY (TrackId) REFERENCES \"tracks\" ON ON UPDATE NO ACTION,\r\n (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TAB AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL LE \"albums\"\r\n(\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NUL  $L,\r\n$ FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistId)  $\r$ N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupp ortRepId ON \"customers\" (SupportRepId)\n\nCREATE TABLE \"playlists\"\r\n

PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $NVARCHAR(120)\r\n)\nCREATE TABLE \"tracks\"\r\n(\r\n$ TrackId INTEGER PR IMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n R, r nBvtes INTEGER.\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTy peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O N UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices \" (CustomerId)\n\n===Additional Context \n\n\n In the 'customers' tabl e, address column names do not have 'Billing' prefix, \n e.a. country col umn name is 'country', not 'BillingCountry'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n1. If the provided context i s sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an in termediate SQL query to find the distinct strings in that column. Prepend th e query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use t he most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n"}, {"rol e": "user", "content": "How many customers are there"}, {"role": "assistan t", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "conten t": "Get the total number of invoices for each customer"}, {"role": "assista nt", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.Invoi ceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "us For the question what are the top 5 countries tha er", "content": "\n the generated SOL statement SELECT Billing t customers come from?, \n Country, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountr y \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Custome rCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount D ESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Customer Count DESC \nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "conten t": "SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY C ountry \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "user", "conten t": " Get the average invoice total for each customer:"}, {"role": "assistan t", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) A S AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "us er", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoic es\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content": "List all employees and their re porting manager's name (if any):"}, {"role": "assistant", "content": "SELECT el.EmployeeId, el.FirstName || ' ' || el.LastName AS EmployeeName, \n COALESCE(e2.FirstName || ' ' || e2.LastName, 'None') AS ManagerName \nFROM e mployees e1 \nLEFT JOIN employees e2 ON e1.ReportsTo = e2.EmployeeId"}, {"ro le": "user", "content": "Find all invoices since 2010 and the total amount i nvoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content":

```
For the question which table stores customer's orders, \n
 the generated SQL statement invoices results in the following exception [ERR
OR-SQL] the generated SQL : invoices\n does not starts with ('select','wit
 Please fix the error and re-generate the SQL\n
 ole": "assistant", "content": "SELECT * FROM invoices"}, {"role": "user", "c
 ontent": "List all invoices with a total exceeding $10"}, {"role": "assistan
 t", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"},
 {"role": "user", "content": "List all albums and their corresponding artist
 names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, a
 r.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.Ar
 tistId"}, {"role": "user", "content": "List all customers who have not place
d any orders:"}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:19:29.713016273Z', 'me
 ssage': {'role': 'assistant', 'content': 'SELECT CustomerId, FirstName, Last
Name \nFROM customers \nWHERE CustomerId NOT IN (SELECT CustomerId FROM invo
 ices)'}, 'done reason': 'stop', 'done': True, 'total duration': 22328808152
 7, 'load duration': 13096218, 'prompt eval count': 1840, 'prompt eval durati
 on': 213106704000, 'eval_count': 24, 'eval_duration': 8560430000}
 [(LLM Response)]
 SELECT CustomerId, FirstName, LastName
 FROM customers
WHERE CustomerId NOT IN (SELECT CustomerId FROM invoices)
 [(SQL)]
 generated SQL statement
SELECT CustomerId, FirstName, LastName
FROM customers
WHERE Customerld NOT IN (SELECT Customerld FROM invoices)
 [(DATA)]
 queried data frame
 CustomerId FirstName LastName
```

Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

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#### # OUESTION - 18:

Can you find the top 10 most popular artists based on the number of tracks?

Hint: There are 3 tables - artists, albums and tracks,

where albums and artists are linked by ArtistId, albums and tracks a re linked by AlbumId,

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# [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n mId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT E NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER PRIM ARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES "artist s" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)\n\nCREATE TABLE "artists"\r\n ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $ARCHAR(120)\r\n)\n\nCREATE INDEX IFK TrackAlbumId ON "tracks" (AlbumId)\n\nC$ REATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOINCRE MENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE TABLE "genres"\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $(\r\n$  $RCHAR(120)\r\n)\nCREATE TABLE "playlist track"\r\n(\r\n$ PlaylistId INTE TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK Playli GER NOT NULL,\r\n stTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\t0 ACTION,\r\n N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n\nCREATE INDEX IFK PlaylistTrackTrackId ON "playlist track'' (TrackId)\n\n===Additional Context \n\n\n In the \'customers\' t able, address column names do not have \'Billing\' prefix, \n y column name is \'country\', not \'BillingCountry\'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explana tions for the question. \n2. If the provided context is almost sufficient bu t requires knowledge of a specific string in a particular column, please gen erate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provide d context is insufficient, please explain why it can\'t be generated. \n4. P lease use the most relevant table(s). \n5. If the question has been asked an d answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'List all genres and the number of tracks

in each genre:'}, {'role': 'assistant', 'content': 'SELECT g.Name AS GenreNa me, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.Ge nreId = t.GenreId\nGROUP BY q.Name'}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPri ce DESC \nLIMIT 5'}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'role': 'assistant', 'content': 'SELECT a.T itle AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%wha t%'"}, {'role': 'user', 'content': 'Find the total number of invoices per co untry'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.Invoice Id) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i. CustomerId\nGROUP BY c.Country'}, {'role': 'user', 'content': "\n the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoic es WHERE Total > 10'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust omerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'content': ' \n an you find the top 10 most popular artists based on the number of tracks?\n Hint: There are 3 tables - artists, albums and tracks, \n where album s and artists are linked by ArtistId, albums and tracks are linked by AlbumI d,\n '}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep\_alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructions. \n===Tables \nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMA RY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n A lbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE R,\r\n Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY

(Albumid) REFERENCES \"albums\" (Albumid) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTv peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\t0N DELETE NO ACTION 0 N UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"albums\"\r\n(\r\nAlbumId INTEG ER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NUL ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENC ES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (ArtistId)\n\nCREATE TAB LE \"artists\"\r\n(\r\n ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NU LL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK TrackAlbumId ON \"tra cks\" (AlbumId)\n\nCREATE TABLE \"playlists\"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\nCREATE$ TABLE \"genres\"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT N Name NVARCHAR(120)\r\n)\n\nCREATE TABLE \"playlist track\"\r\n ULL,\r\n  $(\r\n$ PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n GN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION.\r\n FOREIGN KEY (TrackId) REFERENCES \"tra cks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREA TE INDEX IFK TrackGenreId ON \"tracks\" (GenreId)\n\nCREATE INDEX IFK Playli stTrackTrackId ON \"playlist track\" (TrackId)\n\n===Additional Context \n In the 'customers' table, address column names do not have 'Billing' n ne.g. country column name is 'country', not 'BillingCountry'\n \n\nIn the chinook database invoice means order\n\n===Response Guidelines \n 1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is a lmost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strin gs in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it w as given before. \n"}, {"role": "user", "content": "List all genres and the number of tracks in each genre:"}, {"role": "assistant", "content": "SELECT q.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres q\nJOIN tracks t ON q.GenreId = t.GenreId\nGROUP BY g.Name"}, {"role": "user", "cont ent": "Find the top 5 most expensive tracks (based on unit price):"}, {"rol e": "assistant", "content": "SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "cont ent": "SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all tracks with a name containing \"What\" (case-insensitive) "}, {"ro le": "assistant", "content": "SELECT TrackId, Name FROM tracks WHERE LOWER(N ame) LIKE '%what%'"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c. CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content": For the question what are the top 5 countries that customers come the generated SQL statement SELECT BillingCountry, COUNT(\*) from?, \n as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Custo merCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM cust omers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Ex ecution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFR

OM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-ge nerate the SOL\n "}, {"role": "assistant", "content": "SELECT Countr y, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "user", "content": "List all invoic es with a total exceeding \$10"}, {"role": "assistant", "content": "SELECT In voiceId, Total FROM invoices WHERE Total > 10"}, {"role": "user", "content": "Can you list all tables in the SQLite database catalog?"}, {"role": "assist ant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"r ole": "user", "content": "Get the total number of invoices for each custome r"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.L astName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoice s i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.La stName"}, {"role": "user", "content": "How many customers are there"}, {"rol e": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "use r", "content": " \n Can you find the top 10 most popular artists base d on the number of tracks?\n Hint: There are 3 tables - artists, albu ms and tracks, \n where albums and artists are linked by ArtistId, al bums and tracks are linked by AlbumId,\n "}]

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[(Ollama Response)]
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 (t.TrackId) AS NumberOfTracks\nFROM artists a\nJOIN albums al ON a.ArtistId
= al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId.
 a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, 'done reason': 'stop', 'do
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 t eval count': 1339, 'prompt eval duration': 141431954000, 'eval count': 69,
 'eval duration': 24016703000}
 [(LLM Response)]
 SELECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks
 FROM artists a
JOIN albums al ON a.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
GROUP BY a.ArtistId, a.Name
ORDER BY NumberOfTracks DESC
LIMIT 10
 [(SQL)]
 generated SQL statement
SELECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks
FROM artists a
JOIN albums al ON a.ArtistId = al.ArtistId
JOIN tracks t ON al. Albumid = t. Albumid
GROUP BY a.ArtistId, a.Name
ORDER BY NumberOfTracks DESC
LIMIT 10
 [(DATA)]
 queried data frame
```

ArtistName		NumberOfTracks	
0	Iron Maiden	213	
1	U2	135	
2	Led Zeppelin	114	
3	Metallica	112	
4	Deep Purple	92	
5	Lost	92	
6	Pearl Jam	67	
7	Lenny Kravitz	57	
8	Various Artists	56	
9	The Office	53	

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

### [( Prompt Content )]

[{"role": "system", "content": "The following is a pandas DataFrame that con tains the results of the query that answers the question the user asked: ' Can you find the top 10 most popular artists based on the number o f tracks?\n Hint: There are 3 tables - artists, albums and tracks, \n where albums and artists are linked by ArtistId, albums and tracks are linke d by AlbumId,\n '\n\nThe DataFrame was produced using this guery: SELECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks\nFROM artists a\nJO IN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.Al bumId\nGROUP BY a.ArtistId, a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 10\n \nThe following is information about the resulting pandas DataFrame 'df': \n object\nNumberOfTracks Running df.dtypes gives:\n ArtistName 4\ndtype: object"}, {"role": "user", "content": "Can you generate the Python plotly code to chart the results of the dataframe? Assume the data is in a p andas dataframe called 'df'. If there is only one value in the dataframe, us e an Indicator. Respond with only Python code. Do not answer with any explan ations -- just the code."}]

# [( Ollama Response )] {'model': 'qwen2.5:14

{'model': 'qwen2.5:14b', 'created\_at': '2024-10-13T00:23:10.487929974Z', 'me
ssage': {'role': 'assistant', 'content': 'if len(df) == 1:\n import plotl
y.graph\_objects as go\n fig = go.Figure(go.Indicator(mode="number", value
=df[\'NumberOfTracks\'].iloc[0], title={"text": df[\'ArtistName\'].iloc
[0]}))\nelse:\n import plotly.express as px\n fig = px.bar(df, x=\'Art
istName\', y=\'NumberOfTracks\', title=\'Top 10 Most Popular Artists by Numb
er of Tracks\')\nfig.show()'}, 'done\_reason': 'stop', 'done': True, 'total\_d
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'prompt\_eval\_duration': 22599044000, 'eval\_count': 100, 'eval\_duration': 309
10440000}

```
[(PYTHON)]
generated Plotly code
```

**if** len(df) == 1:

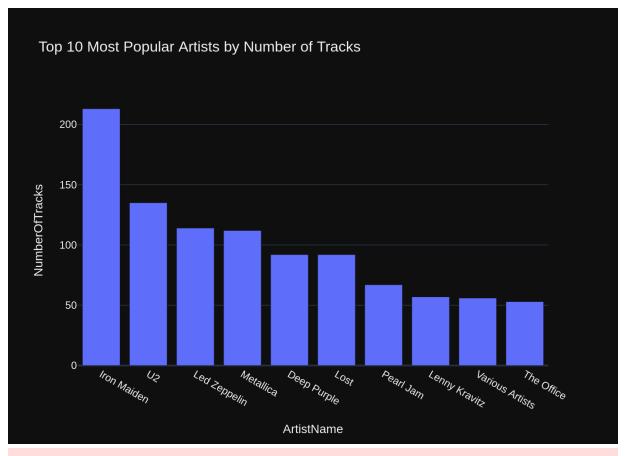
import plotly.graph\_objects as go

fig = go.Figure(go.Indicator(mode="number", value=df['NumberOfTracks'].iloc[0], title={"text": df['ArtistName'].iloc[0]}))

### else:

**import** plotly.express **as** px

fig = px.bar(df, x='ArtistName', y='NumberOfTracks', title='Top 10 Most Popular Artists by Number of Tracks')



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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# QUESTION - 19: List all customers from Canada and their email addresses:

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### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK CustomerSupportRepId ON "customers" (Sup portRepId)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMAR Y KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n  $NVARCHAR(70), \r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n untry NVARCHAR(40),\r\n Phone NVARCHAR(2 Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n  $4), r\n$ portRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE InvoiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT TABLE "invoices"\r\n(\r\n CustomerId INTEGER NOT NULL,\r\n NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingCity NVARCHAR(40),\r BillingState NVARCHAR(40),\r\n BillingCountry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELE TE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE TABLE "employees"\r\n(\r\n d INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(3 BirthDate DATETIME,\r\n 0), r nReportsTo INTEGER.\r\n HireDate DAT ETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n  $VARCHAR(40), \r\n$ Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(6 0), r nFOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice it InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "trac ks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE TABLE "playlist track"\r\n(\r\n TrackId INTEGER NOT NULL,\r\n PlaylistId INTEGER NOT NULL,\r\n RAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KE Y (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\t0N DELETE NO ACTI ON ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "tracks" (Tr ackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK EmployeeReportsTo ON "employees" (ReportsTo)\n\nCREATE TABLE "albums"\r AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN K EY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\n\n
In the \'customer s\' table, address column names do not have \'Billing\' prefix, \n ountry column name is \'country\', not \'BillingCountry\'\n inook database invoice means order\n\n===Response Guidelines \n1. If the pro vided context is sufficient, please generate a valid SQL query without any e xplanations for the question. \n2. If the provided context is almost suffici ent but requires knowledge of a specific string in a particular column, plea se generate an intermediate SQL query to find the distinct strings in that c olumn. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been as ked and answered before, please repeat the answer exactly as it was given be fore. \n'}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL s tatement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCoun try, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \n ORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT Bill ingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCou ntry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: BillingCountr y .\n Please fix the error and re-generate the SQL\n "}, {'rol e': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCount \nFRO M customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMIT 5'}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assis tant', 'content': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'conte nt': 'Find the total number of invoices per country'}, {'role': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM cust omers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Countr y'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstNa me, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstNam e, c.LastName'}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c. FirstName, c.LastName'}, {'role': 'user', 'content': "List all employees and their reporting manager's name (if any):"}, {'role': 'assistant', 'content': "SELECT el.EmployeeId, el.FirstName || ' ' || el.LastName AS EmployeeName, COALESCE(e2.FirstName || ' ' || e2.LastName, 'None') AS ManagerName \nFROM employees e1 \nLEFT JOIN employees e2 ON e1.ReportsTo = e2.EmployeeI d"}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Tota l \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'c For the question which table stores customer's orders, the generated SQL statement invoices results in the following exce ption [ERROR-SQL] the generated SQL : invoices\n does not starts with ('sele ct','with') .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'us er', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'List all invoices with a total exc eeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'List all customers from Canada and their email addresses:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},

keep alive=None

[( Prompt Content )] [{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (S upportRepId)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PR IMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n ddress NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Country NVARCHAR(40),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL.\r\n  $RCHAR(24).\r\n$ SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employe es\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCR EATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER PRIMARY KEY AUTOINCREM ENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETI ME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingCity NVARCHA BillingState NVARCHAR(40),\r\n BillingCountry NVARCHAR(4  $R(40), \r\n$ 0),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMERIC(10,2) NOT N FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) ULL,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK Inv oiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE TABLE \"employees\"\r EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n tName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL.\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n Address NVARCHAR(70),\r\n HireDate DATETIME,\r\n City NVARCHAR(40),\r \n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVA Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n  $RCHAR(10), \r\n$ FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (Emplo  $NVARCHAR(60), \r\n$ yeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMEN T NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACT ION\r\n)\n\nCREATE TABLE sqlite sequence(name, seq)\n\nCREATE TABLE \"playlis t track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, Track NOT NULL,\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId)  $Id), \r\n$ \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK EmployeeReportsTo ON \"employees\" (ReportsT o)\n\nCREATE TABLE \"albums\"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOIN Title NVARCHAR(160) NOT NULL,\r\n CREMENT NOT NULL,\r\n ArtistId INTE FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistI GER NOT NULL.\r\n d) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional C In the 'customers' table, address column names do not have ontext \n\n\n e.g. country column name is 'country', not 'BillingC 'Billing' prefix, \n \n\nIn the chinook database invoice means order\n\n===Response ountry'\n Guidelines \n1. If the provided context is sufficient, please generate a val id SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the d istinct strings in that column. Prepend the query with a comment saying inte

rmediate sql \n3. If the provided context is insufficient, please explain wh y it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer ex actly as it was given before. \n"}, {"role": "user", "content": "\n or the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assis tant", "content": "SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFR OM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.C ountry"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.Fi rstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\n JOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.Fir stName, c.LastName"}, {"role": "user", "content": " Get the average invoice total for each customer:"}, {"role": "assistant", "content": "SELECT c.Custo merId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM cu stomers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Custom erId, c.FirstName, c.LastName"}, {"role": "user", "content": "List all emplo yees and their reporting manager's name (if any):"}, {"role": "assistant", "content": "SELECT el.EmployeeId, el.FirstName || ' ' || el.LastName AS Empl COALESCE(e2.FirstName || ' ' || e2.LastName, 'None') AS M anagerName \nFROM employees e1 \nLEFT JOIN employees e2 ON e1.ReportsTo = e 2.EmployeeId"}, {"role": "user", "content": "Find all invoices since 2010 an d the total amount invoiced:"}, {"role": "assistant", "content": "SELECT Inv oiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"rol e": "user", "content": "\n For the question which table stores custom er's orders. \n the generated SQL statement invoices results in the f ollowing exception [ERROR-SQL] the generated SQL : invoices\n does not start Please fix the error and re-generate the s with ('select','with') .\n "}, {"role": "assistant", "content": "SELECT \* FROM invoices"}, S0L\n {"role": "user", "content": "Can you list all tables in the SQLite database catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "List all invoices with a total exceeding \$10"}, {"role": "assistant", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"role": "user", "content": "List al l customers from Canada and their email addresses:"}]

[( Ollama Response )]
{'model': 'qwen2.5:14b', 'created\_at': '2024-10-13T00:26:29.684665587Z', 'me
ssage': {'role': 'assistant', 'content': "SELECT CustomerId, FirstName, Last
Name, Email \nFROM customers \nWHERE Country = 'Canada'"}, 'done\_reason': 's
top', 'done': True, 'total\_duration': 199097973645, 'load\_duration': 1070855
1, 'prompt\_eval\_count': 1655, 'prompt\_eval\_duration': 190436046000, 'eval\_co
unt': 20, 'eval duration': 7028007000}

[( LLM Response )]
SELECT CustomerId, FirstName, LastName, Email
FROM customers
WHERE Country = 'Canada'

[( SQL )]
generated SQL statement
SELECT CustomerId, FirstName, LastName, Email

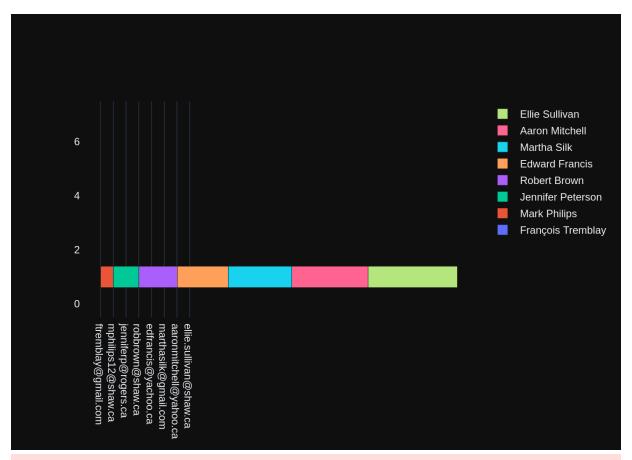
FROM customers

**WHERE** Country = 'Canada'

[( DATA )]
queried data frame

	CustomerId	FirstName	LastName	Email
0	3	François	Tremblay	ftremblay@gmail.com
1	14	Mark	Philips	mphilips12@shaw.ca
2	15	Jennifer	Peterson	jenniferp@rogers.ca
3	29	Robert	Brown	robbrown@shaw.ca
4	30	Edward	Francis	edfrancis@yachoo.ca
5	31	Martha	Silk	marthasilk@gmail.com
6	32	Aaron	Mitchell	aaronmitchell@yahoo.ca
7	33	Ellie	Sullivan	ellie.sullivan@shaw.ca

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Li
 st all customers from Canada and their email addresses:'\n\nThe DataFrame wa
 s produced using this query: SELECT CustomerId, FirstName, LastName, Email
 \nFROM customers \nWHERE Country = 'Canada'\n\nThe following is information
about the resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n Cust
 int64\nFirstName
 object\nLastName
 omerId
 obiect\nEmail
 object\ndtype: object"}, {"role": "user", "content": "Can you generate the P
ython plotly code to chart the results of the dataframe? Assume the data is
 in a pandas dataframe called 'df'. If there is only one value in the datafra
me, use an Indicator. Respond with only Python code. Do not answer with any
 explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:27:27.143048192Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objects as go
 \n = 1:\n fig = go.Figure(go.Indicator(mode="text", value=df"))
 [\FirstName'].iloc[0] + \' + df[\LastName'].iloc[0]))
 for index, row in df.iterrows():\n
= qo.Figure()\n
 fig.add trace(g
 o.Bar(x=[row[\'Email']], y=[1], name=f"{row[\'FirstName']} {row[\'LastName]
\']}", orientation=\'h\'))\n
 fig.update layout(barmode=\'stack\', yaxis=d
 ict(showqrid=False, range=[-0.5, len(df)-0.5]))\n\nfig.show()'}, 'done reaso
 n': 'stop', 'done': True, 'total duration': 57416642191, 'load duration': 13
 398650, 'prompt_eval_count': 173, 'prompt_eval_duration': 14298635000, 'eval
 count': 137, 'eval duration': 42966739000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph_objects as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="text", value=df['FirstName'].iloc[0] + ' ' + df['LastNam
e'].iloc[0]))
else:
 fig = go.Figure()
 for index, row in df.iterrows():
 fig.add trace(go.Bar(x=[row['Email']], y=[1], name=f"{row['FirstName']} {row['LastName']}
e']}", orientation='h'))
 fig.update layout(barmode='stack', yaxis=dict(showgrid=False, range=[-0.5, len(df)-0.5]))
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

\_\_\_\_\_\_

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# QUESTION - 20: Find the customer with the most invoices

\_\_\_\_\_\_

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### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou BillingPostalCode NVARCHAR(10),\r\n Total NUMER ntry NVARCHAR(40),\r\n IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE INDEX IFK I nvoiceLineInvoiceId ON "invoice\_items" (InvoiceId)\n\nCREATE TABLE "invoice\_ InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL  $items"\r\n(\r\n$ InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) REFERENCES "trac ks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE TABLE "c ustomers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL FirstName NVARCHAR(40) NOT NULL,\r\n L.\r\n LastName NVARCHAR(20) NO T NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n State NVARCHAR(40),\r\n v NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportR epId ON "customers" (SupportRepId)\n\nCREATE TABLE "employees"\r\n(\r\n mployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARCH AR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL,\r\n Title NVAR ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n  $CHAR(30), \r\n$ te DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n tate NVARCHAR(40),\r\n PostalCode NVARCHAR(1  $0), \r\n$ Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n Email NVARCHA FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r \n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK Emplo yeeReportsTo ON "employees" (ReportsTo)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(20 AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NUL 0) NOT NULL,\r\n L.\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n s INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) N FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t OT NULL,\r\n ON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERE NCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n\n In the \'customers\' tabl e, address column names do not have \'Billing\' prefix, \n e.g. country c

olumn name is \'country\', not \'BillingCountry\'\n \n\n===Response Guide lines \n1. If the provided context is sufficient, please generate a valid SQ L query without any explanations for the question. \n2. If the provided cont ext is almost sufficient but requires knowledge of a specific string in a pa rticular column, please generate an intermediate SQL query to find the disti nct strings in that column. Prepend the query with a comment saying intermed iate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactl y as it was given before. \n'}, {'role': 'user', 'content': 'Get the total n umber of invoices for each customer'}, {'role': 'assistant', 'content': 'SEL ECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoic es\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': ' Ge t the average invoice total for each customer:'}, {'role': 'assistant', 'con tent': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS Averag eInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Custome rId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'con tent': 'Find the total number of invoices per country'}, {'role': 'assistan t', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Coun try'}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoic es WHERE Total > 10'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SEL ECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELECT TrackId, Name, Unit Price \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, {'role': 'user', For the question which table stores customer's orders, 'content': "\n the generated SQL statement invoices results in the following exce ption [ERROR-SQL] the generated SQL : invoices\n does not starts with ('sele ct','with') .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'us er', 'content': 'How many customers are there'}, {'role': 'assistant', 'cont ent': 'SELECT COUNT(\*) FROM customers'}, {'role': 'user', 'content': 'List a ll customers from Canada and their email addresses: '}, {'role': 'assistant', 'content': "SELECT CustomerId, FirstName, LastName, Email \nFROM customers \nWHERE Country = 'Canada'"}, {'role': 'user', 'content': "\n For the question what are the top 5 countries that customers come from?, \n he generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum Please fix the error and re-generate the SQL\n n: BillingCountry .\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': 'Find the customer with the most invoices '}]

[Ollama parameters]
model=qwen2.5:14b,
options={},

keep alive=None

[( Prompt Content )] [{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"inv InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT oice items\"\r\n(\r\n NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NUL  $L,\r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NU FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n LL.\r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackId) RE FERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO N\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId) \n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AU TOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n me NVARCHAR(20) NOT NULL.\r\n Company NVARCHAR(80),\r\n Address NVARC City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n  $HAR(70), \r\n$ PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n  $NVARCHAR(40), \r\n$ Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId I FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (Employee Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK CustomerSupportRepId ON \"customers\" (SupportRepId)\n\nCREATE TABLE \"empl EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r oyees\"\r\n(\r\n \n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NU Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n BirthDate DA  $LL,\r\n$ TETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n City N  $VARCHAR(40), \r\n$ State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"e 4),\r\n mployees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE INDEX IFK EmployeeReportsTo ON \"employees\" (ReportsTo)\n\nCREAT E TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER.\r\n diaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHA Milliseconds INTEGER NOT NULL,\r\n Bvtes INTEGER.\r\n  $R(220), \r\n$ UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES  $\$  (AlbumId)  $\$  \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\t0N DELETE NO A CTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES \"med ia types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\n===Additional Context \n\nIn the chinook database invoice means ord In the 'customers' table, address column names do not have 'Bill er\n\n\n e.g. country column name is 'country', not 'BillingCountr ing' prefix, \n \n\n===Response Guidelines \n1. If the provided context is sufficien t, please generate a valid SQL guery without any explanations for the guesti on. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate

SQL query to find the distinct strings in that column. Prepend the query wit h a comment saying intermediate sql \n3. If the provided context is insuffic ient, please explain why it can't be generated. \n4. Please use the most rel evant table(s). \n5. If the question has been asked and answered before, ple ase repeat the answer exactly as it was given before. \n"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT (i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.Custo merId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"ro le": "user", "content": " Get the average invoice total for each custome r:"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c. LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJ0IN invoic es i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.L astName"}, {"role": "user", "content": "Find the total number of invoices pe r country"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.Inv oiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content": "List all invoices with a total exceeding \$10"}, {"role": "assistant", "content": "SEL ECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"role": "user", "con tent": "Find all invoices since 2010 and the total amount invoiced:"}, {"rol e": "assistant", "content": "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "Find the top 5 m ost expensive tracks (based on unit price):"}, {"role": "assistant", "conten t": "SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "content": "\n For the question which t able stores customer's orders, \n the generated SQL statement invoice s results in the following exception [ERROR-SQL] the generated SQL : invoice s\n does not starts with ('select','with') .\n Please fix the error a nd re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT \* FROM invoices"}, {"role": "user", "content": "How many customers are ther e"}, {"role": "assistant", "content": "SELECT COUNT(\*) FROM customers"}, {"r ole": "user", "content": "List all customers from Canada and their email add resses:"}, {"role": "assistant", "content": "SELECT CustomerId, FirstName, L astName, Email \nFROM customers \nWHERE Country = 'Canada'"}, {"role": "use r", "content": "\n For the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCo untry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as Custome rCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount D ESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY Customer Count DESC \nLIMIT 5': no such column: BillingCountry .\n Please fix "}, {"role": "assistant", "conten the error and re-generate the SQL\n t": "SELECT Country, COUNT(\*) AS CustomerCount \nFROM customers \nGROUP BY C ountry \nORDER BY CustomerCount DESC \nLIMIT 5"}, {"role": "user", "conten t": "Find the customer with the most invoices "}]

[( Ollama Response )]
{'model': 'qwen2.5:14b', 'created\_at': '2024-10-13T00:31:04.970710903Z', 'me
ssage': {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName,
c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoi
ces i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.
LastName\nORDER BY InvoiceCount DESC\nLIMIT 1'}, 'done\_reason': 'stop', 'don
e': True, 'total\_duration': 217711179011, 'load\_duration': 10866372, 'prompt
\_eval\_count': 1652, 'prompt\_eval\_duration': 194130659000, 'eval\_count': 59,

```
'eval_duration': 21873221000}
 [(LLM Response)]
 SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceC
ount
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.CustomerId, c.FirstName, c.LastName
ORDER BY InvoiceCount DESC
LIMIT 1
[(SQL)]
generated SQL statement
SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.Customerld, c.FirstName, c.LastName
ORDER BY InvoiceCount DESC
LIMIT 1
 [(DATA)]
queried data frame
 CustomerId FirstName LastName InvoiceCount
 7
0
 1
 Luís Gonçalves
```

```
[Ollama parameters]
model=qwen2.5:14b,
options={},
keep_alive=None
```

[( Prompt Content )] [{"role": "system", "content": "The following is a pandas DataFrame that con tains the results of the query that answers the question the user asked: 'Fi nd the customer with the most invoices '\n\nThe DataFrame was produced using this query: SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Custo merId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DESC\nLIMIT 1\n\nThe following is information about the resulting pandas Dat int64\nFirstName aFrame 'df': \nRunning df.dtypes gives:\n CustomerId object\nLastName object\nInvoiceCount int64\ndtype: object"}, {"r ole": "user", "content": "Can you generate the Python plotly code to chart t he results of the dataframe? Assume the data is in a pandas dataframe called 'df'. If there is only one value in the dataframe, use an Indicator. Respond with only Python code. Do not answer with any explanations -- just the cod e."}]

[( Ollama Response )] {'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:32:17.692019296Z', 'me ssage': {'role': 'assistant', 'content': 'import plotly.graph objs as go\n\n \'data\': [go.Indicator(\n if  $len(df) == 1:\n$  $figure = {\n}$ mode=\'number+delta\',\n value=df[\'InvoiceCount\'].iloc[0],\n number={\'suffix\': " Invoices"},\n delta={\'position\': \'right \'}\n )]\n }\nelse:\n  $figure = {\n}$ \'data\': [\n go.Bar(x=df['FirstName'] + ' ' + df['LastName'], y=df['InvoiceCount}\n\nfigure[\'layout\'] = go.Layout(title=\'Customer wi ]\n th the Most Invoices\', xaxis=dict(title=\'Customer\'), yaxis=dict(title=\'N umber of Invoices\'))\n\nfigure[\'layout\'].update(margin=dict(l=50, r=50, b =100))\n\ngo.Figure(figure).show()'}, 'done reason': 'stop', 'done': True, 'total duration': 72672863955, 'load duration': 10476149, 'prompt eval coun t': 213, 'prompt eval duration': 18045478000, 'eval count': 171, 'eval durat ion': 54479712000}

# Customer with the Most Invoices

[( PYTHON )]
generated Plotly code

# import plotly.graph\_objs as go

```
if len(df) == 1:
 figure = {
 'data': [go.Indicator(
 mode='number+delta',
 value=df['InvoiceCount'].iloc[0],
 number={'suffix': " Invoices"},
 delta={'position': 'right'}
)]
else:
 figure = {
 'data': [
 go.Bar(x=df['FirstName'] + ' ' + df['LastName'], y=df['InvoiceCount'])
]
 }
figure['layout'] = go.Layout(title='Customer with the Most Invoices', xaxis=dict(title='Custom
er'), yaxis=dict(title='Number of Invoices'))
figure['layout'].update(margin=dict(l=50, r=50, b=100))
go.Figure(figure).show()
 Number of requested results 10 is greater than number of elements in index
 2, updating n results = 2
```

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# QUESTION - 21: Find the customer who bought the most albums in total quantity (across all invoices):

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#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n MediaTypeId INTEGER NOT NULL,\r\n mId INTEGER,\r\n GenreId INTEGER,\r Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\nCREATE TABLE "invoice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NU TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NU  $LL,\r\n$ LL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERE NCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DEL ETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(16 0) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistI d) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId)\n\nCREA TE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingCity NVARCHAR(4 BillingState NVARCHAR(40),\r\n BillingCountry NVARCHAR(40),\r BillingPostalCode NVARCHAR(10),\r\n Total NUMERIC(10,2) NOT NUL FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK Invoice LineTrackId ON "invoice items" (TrackId)\n\nCREATE INDEX IFK InvoiceLineInvo iceId ON "invoice items" (InvoiceId)\n\nCREATE INDEX IFK InvoiceCustomerId O N "invoices" (CustomerId)\n\nCREATE INDEX IFK TrackAlbumId ON "tracks" (Albu mId)\n\nCREATE TABLE "artists"\r\n(\r\n ArtistId INTEGER PRIMARY KEY AUTO INCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\n===Additional Contex$ t \n\nIn the chinook database invoice means order\n\n\n In the \'customer s\' table, address column names do not have \'Billing\' prefix, \n ountry column name is \'country\', not \'BillingCountry\'\n \n\n===Respon se Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provi ded context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find th e distinct strings in that column. Prepend the query with a comment saying i ntermediate sql \n3. If the provided context is insufficient, please explain why it can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'Find the

customer with the most invoices '}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nF ROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c. CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DESC\nLIMIT 1'}, {'role': 'user', 'content': ' \n Can you find the top 10 most popular artists based on the number of tracks?\n Hint: There are 3 tables - a rtists, albums and tracks, \n where albums and artists are linked by ArtistId, albums and tracks are linked by AlbumId,\n '}, {'role': 'assist ant', 'content': 'SELECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfT racks\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN trac ks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId, a.Name\nORDER BY Number OfTracks DESC\nLIMIT 10'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c. CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFR OM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.C ustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SEL ECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'con tent': ' Get the average invoice total for each customer:'}, {'role': 'assis tant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Tota l) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'rol e': 'assistant', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalIn voices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGR OUP BY c.Country'}, {'role': 'user', 'content': 'Find all invoices since 201 0 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {'ro le': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, {'role': 'user', 'conte nt': 'List all albums and their corresponding artist names '}, {'role': 'as sistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \n FROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'use r', 'content': 'List all genres and the number of tracks in each genre:'}, {'role': 'assistant', 'content': 'SELECT g.Name AS GenreName, COUNT(t.TrackI d) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId \nGROUP BY g.Name'}, {'role': 'user', 'content': 'Find the customer who boug ht the most albums in total quantity (across all invoices):'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMA RY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n MediaTypeId INTEGER NOT NULL,\r\n lbumId INTEGER,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n R, r nBytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPD FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) ATE NO ACTION,\r\n

\r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTv peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION 0 N UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n eLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER TrackId INTEGER NOT NULL,\r\n NOT NULL,\r\n UnitPrice NUMERIC(10,2) Quantity INTEGER NOT NULL,\r\n NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t \tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"albums\"\r  $n(\r\n$ AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN K EY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (Ar tistId)\n\nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER PRIMARY K CustomerId INTEGER NOT NULL,\r\n EY AUTOINCREMENT NOT NULL,\r\n ceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n Billin BillingState NVARCHAR(40),\r\n gCity NVARCHAR(40),\r\n BillingCountry  $NVARCHAR(40), \r\n$ BillingPostalCode NVARCHAR(10),\r\n Total NUMERIC(1 FOREIGN KEY (CustomerId) REFERENCES \"customers\" (Cu 0.2) NOT NULL.\r\n stomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE IND EX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE INDEX IFK I nvoiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE INDEX IFK TrackAlbum Id ON \"tracks\" (AlbumId)\n\nCREATE TABLE \"artists\"\r\n(\r\n INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n \n\n===Additional Context \n\nIn the chinook database invoice means order\n In the 'customers' table, address column names do not have 'Billing' e.g. country column name is 'country', not 'BillingCountry'\n prefix, \n \n\n===Response Guidelines \n1. If the provided context is sufficient, pleas e generate a valid SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a spe cific string in a particular column, please generate an intermediate SQL que ry to find the distinct strings in that column. Prepend the query with a com ment saying intermediate sql \n3. If the provided context is insufficient, p lease explain why it can't be generated. \n4. Please use the most relevant t able(s). \n5. If the question has been asked and answered before, please rep eat the answer exactly as it was given before. \n"}, {"role": "user", "conte nt": "Find the customer with the most invoices "}, {"role": "assistant", "co ntent": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Customer Id\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DE SC\nLIMIT 1"}, {"role": "user", "content": " \n Can you find the top 10 most popular artists based on the number of tracks?\n Hint: There are 3 tables - artists, albums and tracks, \n where albums and artist s are linked by ArtistId, albums and tracks are linked by AlbumId,\n {"role": "assistant", "content": "SELECT a.Name AS ArtistName, COUNT(t.Track Id) AS NumberOfTracks\nFROM artists a\nJOIN albums al ON a.ArtistId = al.Art istId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId, a.Name \nORDER BY NumberOfTracks DESC\nLIMIT 10"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "con tent": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Custome rId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "user", "con tent": "List all invoices with a total exceeding \$10"}, {"role": "assistan t", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"role": "user", "content": " Get the average invoice total for each custome

r:"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c. LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoic es i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.L astName"}, {"role": "user", "content": "Find the total number of invoices pe r country"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.Inv oiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "Find the top 5 most expensive t racks (based on unit price):"}, {"role": "assistant", "content": "SELECT Tra ckId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, a r.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.Ar tistId"}, {"role": "user", "content": "List all genres and the number of tra cks in each genre:"}, {"role": "assistant", "content": "SELECT g.Name AS Gen reName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.Name"}, {"role": "user", "content": "Find the customer who bought the most albums in total quantity (across all invoic es):"}]

[( Ollama Response )]
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ssage': {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName,
c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN in
voices i ON c.CustomerId = i.CustomerId\nJOIN invoice\_items ii ON i.InvoiceI
d = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON
t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDE
R BY TotalAlbumsBought DESC\nLIMIT 1'}, 'done\_reason': 'stop', 'done': True,
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t': 1451, 'prompt\_eval\_duration': 164861583000, 'eval\_count': 104, 'eval\_dur
ation': 38366939000}
[( LLM Response )]

[( LLM Response )]
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbum
sBought
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
JOIN invoice\_items ii ON i.InvoiceId = ii.InvoiceId
JOIN tracks t ON ii.TrackId = t.TrackId
JOIN albums al ON t.AlbumId = al.AlbumId
GROUP BY c.CustomerId, c.FirstName, c.LastName
ORDER BY TotalAlbumsBought DESC
LIMIT 1
[( SQL )]

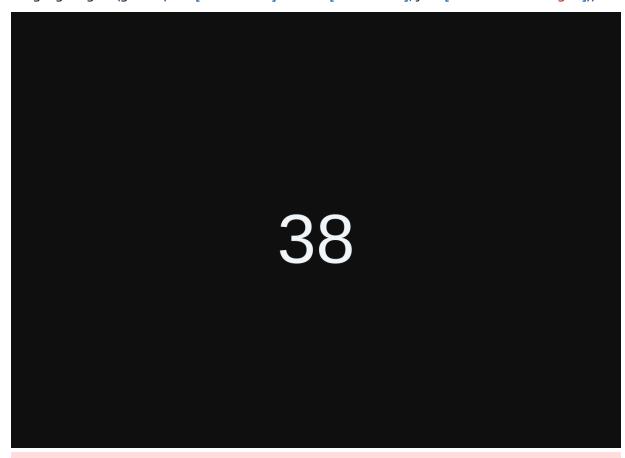
generated SQL statement

```
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
JOIN invoice items ii ON i.InvoiceId = ii.InvoiceId
JOIN tracks t ON ii.TrackId = t.TrackId
JOIN albums al ON t.Albumid = al.Albumid
GROUP BY c.Customerld. c.FirstName. c.LastName
ORDER BY TotalAlbumsBought DESC
LIMIT 1
 [(DATA)]
 queried data frame
 CustomerId FirstName LastName TotalAlbumsBought
0
 Luís Gonçalves
 38
 [Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Fi
 nd the customer who bought the most albums in total quantity (across all inv
oices):'\n\nThe DataFrame was produced using this guery: SELECT c.CustomerI
 d, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM cust
 omers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items
 ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJ
 OIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName,
 c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1\n\nThe following is inf
 ormation about the resulting pandas DataFrame 'df': \nRunning df.dtypes give
 int64\nFirstName
 s:\n CustomerId
 object\nLastName
 int64\ndtype: object"}, {"role": "user", "cont
 object\nTotalAlbumsBought
ent": "Can you generate the Python plotly code to chart the results of the d
 ataframe? Assume the data is in a pandas dataframe called 'df'. If there is
 only one value in the dataframe, use an Indicator. Respond with only Python
 code. Do not answer with any explanations -- just the code."}]
 [(Ollama Response)]
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 sage': {'role': 'assistant', 'content': 'import plotly.graph objects as go\n
 \nif len(df) == 1:\n fig = go.Figure(go.Indicator(mode="number", value=df
 [\'TotalAlbumsBought\'].iloc[0]))\nelse:\n
 fig = go.Figure(go.Bar(x=df
 [\'FirstName'] + \' ' + df[\'LastName'], y=df[\'TotalAlbumsBought'])) \
 iq.show()'}, 'done reason': 'stop', 'done': True, 'total duration': 48371779
 427, 'load_duration': 12420849, 'prompt_eval_count': 271, 'prompt_eval_durat
 ion': 23637453000, 'eval count': 78, 'eval duration': 24590852000}
 [(PYTHON)]
 generated Plotly code
```

import plotly.graph\_objects as go

if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['TotalAlbumsBought'].iloc[0]))
else:

fig = go.Figure(go.Bar(x=df['FirstName'] + ' ' + df['LastName'], y=df['TotalAlbumsBought']))



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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#### # OUESTION - 22:

Find the top 5 customers who bought the most albums in total quantit y (across all invoices):

Hint: album quantity is found in invoice items,

\_\_\_\_\_

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#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoice items"\r\n(\r\n InvoiceLineId IN TEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NUL TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NUL  $L,\r\n$ Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFEREN CES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DEL N, r nETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(20 AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NUL 0) NOT NULL,\r\n L.\r\n GenreId INTEGER.\r\n Composer NVARCHAR(220),\r\n Millisecond s INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) N FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t OT NULL,\r\n ON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERE NCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENCES "media\_types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(16 0) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistI d) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON "invoice items" (Inv oiceId)\n\nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n ate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillinaCi BillingState NVARCHAR(40),\r\n ty NVARCHAR(40),\r\n BillingCountry NVA  $RCHAR(40), \r\n$ BillingPostalCode NVARCHAR(10),\r\n Total NUMERIC(10,2) FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerI NOT NULL,\r\n d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE INDEX IFK AlbumArt istId ON "albums" (ArtistId)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoi ces" (CustomerId)\n\nCREATE TABLE "artists"\r\n(\r\n ArtistId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120) $\r\n)\n\n$ CREATE IN DEX IFK TrackAlbumId ON "tracks" (AlbumId)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n\n In the \'customers\' tabl e, address column names do not have \'Billing\' prefix, \n e.g. country c olumn name is \'country\', not \'BillingCountry\'\n \n\n===Response Guide lines \n1. If the provided context is sufficient, please generate a valid SQ L query without any explanations for the question. \n2. If the provided cont ext is almost sufficient but requires knowledge of a specific string in a pa rticular column, please generate an intermediate SQL query to find the disti nct strings in that column. Prepend the query with a comment saying intermed iate sql \n3. If the provided context is insufficient, please explain why it

can\'t be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactl y as it was given before. \n'}, {'role': 'user', 'content': 'Find the custom er who bought the most albums in total quantity (across all invoices):'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastNa me, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.In voiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumI d = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY Tot alAlbumsBought DESC\nLIMIT 1'}, {'role': 'user', 'content': ' \n you find the top 10 most popular artists based on the number of tracks?\n Hint: There are 3 tables - artists, albums and tracks, \n s and artists are linked by ArtistId, albums and tracks are linked by AlbumI '}, {'role': 'assistant', 'content': 'SELECT a.Name AS ArtistName, C OUNT(t.TrackId) AS NumberOfTracks\nFROM artists a\nJOIN albums al ON a.Artis tId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.Artis tId, a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, {'role': 'user', 'con tent': 'Find the customer with the most invoices '}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Custo merId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DESC\nLIMIT 1'}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total F ROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'conte nt': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DES C \nLIMIT 5'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c. FirstName, c.LastName'}, {'role': 'user', 'content': ' Get the average invoi ce total for each customer:'}, {'role': 'assistant', 'content': 'SELECT c.Cu stomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Cust omerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'Find the tot al number of invoices per country'}, {'role': 'assistant', 'content': 'SELEC T c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN inv oices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Country'}, {'role': 'use r', 'content': 'Find all invoices since 2010 and the total amount invoice d:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Total \nFROM invoi ces \nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'List all albums and their corresponding artist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM album s a \nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'conte Find the top 5 customers who bought the most albums in total quantity (across all invoices):\n Hint: album quantity is found in invoice items, \n

```
[Ollama parameters]
model=qwen2.5:14b,
options={},
keep_alive=None
[(Prompt Content)]
```

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based

on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NU TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NU  $LL,\r\n$ Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERE LL,\r\n NCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON D ELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(20 0) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NUL  $L,\r\n$ GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n Millisecond s INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) N FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t OT NULL.\r\n \tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFE RENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO FOREIGN KEY (MediaTypeId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"album  $s\''\r\n(\r\n$ AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n itle NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL.\r\n IGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO AC TION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREATE TABLE \"invoices\"\r\n(\r\n ceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARC  $HAR(70).\r\n$ BillingCity NVARCHAR(40),\r\n BillingState NVARCHAR(4 0),\r\n BillingCountry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(1 Total NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) RE 0),\r\n FERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (Tra ckId)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (ArtistId)\n\nCREATE I NDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE TABLE \"ar ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n tists\"\r\n(\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK TrackAlbumId ON \"tracks\" (Albu  $mId) \\ n \\ n = = Additional Context \\ n \\ nIn the chinook database invoice means or$ In the 'customers' table, address column names do not have 'Bil der\n\n\n ling' prefix, \n e.g. country column name is 'country', not 'BillingCount \n\n===Response Guidelines \n1. If the provided context is sufficie nt, please generate a valid SQL query without any explanations for the quest ion. \n2. If the provided context is almost sufficient but requires knowledg e of a specific string in a particular column, please generate an intermedia te SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insuf ficient, please explain why it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n"}, {"role": "use r", "content": "Find the customer who bought the most albums in total quanti ty (across all invoices):"}, {"role": "assistant", "content": "SELECT c.Cust omerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice it ems ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackI d\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstN ame, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1"}, {"role": "use r", "content": " \n Can you find the top 10 most popular artists base d on the number of tracks?\n Hint: There are 3 tables - artists, albu ms and tracks, \n where albums and artists are linked by ArtistId, al "}, {"role": "assistant", "conte bums and tracks are linked by AlbumId,\n

nt": "SELECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t ON al.A lbumId = t.AlbumId\nGROUP BY a.ArtistId, a.Name\nORDER BY NumberOfTracks DES C\nLIMIT 10"}, {"role": "user", "content": "Find the customer with the most invoices "}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstN ame, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstNam e, c.LastName\nORDER BY InvoiceCount DESC\nLIMIT 1"}, {"role": "user", "cont ent": "List all invoices with a total exceeding \$10"}, {"role": "assistant", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"rol e": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "content": "SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "conte nt": "Get the total number of invoices for each customer"}, {"role": "assist ant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.Invo iceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "us er", "content": " Get the average invoice total for each customer:"}, {"rol e": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, A VG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.C ustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "user", "content": "Find the total number of invoices per countr y"}, {"role": "assistant", "content": "SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust omerId\nGROUP BY c.Country"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "conten t": "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01 -01'"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumT itle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": " \n Find the top 5 customers who bought the most albums in total quantity (across all invoice s):\n Hint: album quantity is found in invoice items, \n

### [( Ollama Response )]

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ssage': {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName,
c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN in
voices i ON c.CustomerId = i.CustomerId\nJOIN invoice\_items ii ON i.InvoiceI
d = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON
t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDE
R BY TotalAlbumsBought DESC\nLIMIT 5'}, 'done\_reason': 'stop', 'done': True,
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t': 1538, 'prompt\_eval\_duration': 176778325000, 'eval\_count': 104, 'eval\_dur
ation': 37992573000}

#### [( LLM Response )]

SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbum sBought

FROM customers c

JOIN invoices i ON c.CustomerId = i.CustomerId

JOIN invoice items ii ON i.InvoiceId = ii.InvoiceId

JOIN tracks t ON ii.TrackId = t.TrackId

JOIN albums al ON t.AlbumId = al.AlbumId

 ${\tt GROUP~BY~c.CustomerId,~c.FirstName,~c.LastName}$ 

ORDER BY TotalAlbumsBought DESC

LIMIT 5

[( SQL )]

generated SQL statement

SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought

**FROM** customers **c** 

JOIN invoices i ON c.CustomerId = i.CustomerId

JOIN invoice\_items ii ON i.InvoiceId = ii.InvoiceId

JOIN tracks t ON ii.TrackId = t.TrackId

JOIN albums al ON t.AlbumId = al.AlbumId

**GROUP BY c**.CustomerId, **c**.FirstName, **c**.LastName

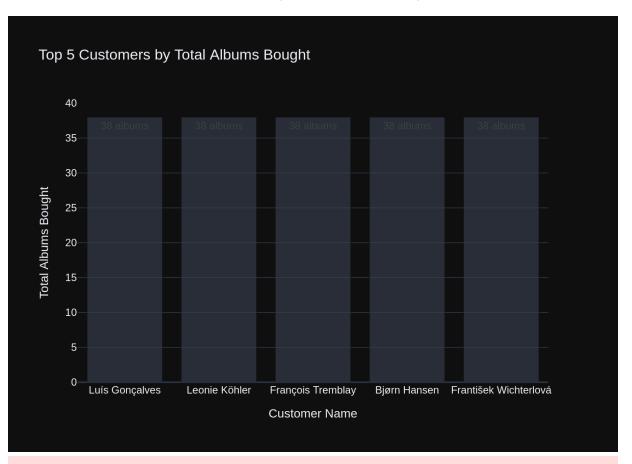
ORDER BY TotalAlbumsBought DESC

LIMIT 5

[( DATA )]
queried data frame

	CustomerId	FirstName	LastName	TotalAlbumsBought
0	1	Luís	Gonçalves	38
1	2	Leonie	Köhler	38
2	3	François	Tremblay	38
3	4	Bjørn	Hansen	38
4	5	František	Wichterlová	38

```
[Ollama parameters]
 model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: '
 Find the top 5 customers who bought the most albums in total quant
 ity (across all invoices):\n
 Hint: album quantity is found in invoice
 items, \n
 '\n\nThe DataFrame was produced using this query: SELECT c.Cus
 tomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFR0
 M customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice
 items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.Trac
 kId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.Firs
 tName, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 5\n\nThe following
 is information about the resulting pandas DataFrame 'df': \nRunning df.dtype
 s gives:\n CustomerId
 int64\nFirstName
 object\nLastNam
 object\nTotalAlbumsBought
 int64\ndtype: object"}, {"role":
 "user", "content": "Can you generate the Python plotly code to chart the res
 ults of the dataframe? Assume the data is in a pandas dataframe called 'df'.
 If there is only one value in the dataframe, use an Indicator. Respond with
 only Python code. Do not answer with any explanations -- just the code."}]
 [(Ollama Response)]
 {'model': 'gwen2.5:14b', 'created at': '2024-10-13T00:41:23.612999691Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objects as go
 \n\nif len(df) == 1:\n fig = qo.Figure(go.Indicator(mode="number", value=
 df[\TotalAlbumsBought'].iloc[0]))\nelse:\n fig = go.Figure(go.Bar(x=df
 [\'FirstName'] + \' ' + df[\'LastName'], y=df[\'TotalAlbumsBought'], n
 marker=dict(color=\'rgba(58, 71, 80, 0.6)\'),\n
 t
 ext=df[\'TotalAlbumsBought'].apply(lambda x: f\'{x} albums\'),\n
 textposition=\'auto\'))\n
 fig.update layout(title=\'Top 5 Customers by To
 tal Albums Bought\',\n
 xaxis title=\'Customer Name\', y
 axis title=\'Total Albums Bought\')\nfig.show()'}, 'done reason': 'stop', 'd
 one': True, 'total duration': 75967171962, 'load duration': 13994231, 'promp
 t eval count': 289, 'prompt eval duration': 25454924000, 'eval count': 158,
 'eval duration': 50364622000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objects as go
if len(df) == 1:
 fig = qo.Figure(qo.Indicator(mode="number", value=df['TotalAlbumsBought'].iloc[0]))
else:
 fig = qo.Figure(qo.Bar(x=df['FirstName'] + ' ' + df['LastName'], y=df['TotalAlbumsBought'],
 marker=dict(color='rgba(58, 71, 80, 0.6)'),
 text=df['TotalAlbumsBought'].apply(lambda x: f'{x} albums'),
 textposition='auto'))
 fig.update layout(title='Top 5 Customers by Total Albums Bought',
 xaxis_title='Customer Name', yaxis_title='Total Albums Bought')
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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#### # OUESTION - 23:

Find the top 5 customers who spent the most money overall,
Hint: order total can be found on invoices table, calculation using
invoice items detail table is unnecessary

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## [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE InvoiceLineId INTEGER PRIMARY KEY AUTOINCR TABLE "invoice items"\r\n(\r\n EMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Ouantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON "invoice items" (Invoi ceId)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCR EATE INDEX IFK InvoiceLineTrackId ON "invoice items" (TrackId)\n\nCREATE TAB CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT LE "customers"\r\n(\r\n NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(20) Company NVARCHAR(80),\r\n Address NVARCHAR(70),\r\n NOT NULL,\r\n State NVARCHAR(40),\r\n ity NVARCHAR(40),\r\n Country NVARCHAR(40),\r PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Fax NVARCHA Email NVARCHAR(60) NOT NULL,\r\n SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" (EmployeeId) \r\n\t\tON DE LETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n LastName NVARC FirstName NVARCHAR(20) NOT NULL,\r\n HAR(20) NOT NULL,\r\n Title NVA  $RCHAR(30), \r\n$ ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n ate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n State NVARCHAR(40),\r\n PostalCode NVARCHAR Phone NVARCHAR(24),\r\n Fax NVARCHAR(24),\r\n FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId)  $HAR(60), \r\n$ \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "track TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n AlbumId INTEGER,\r\n me NVARCHAR(200) NOT NULL,\r\n MediaTypeId INTEG ER NOT NULL,\r\n GenreId INTEGER,\r\n Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMER FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumI IC(10,2) NOT NULL,\r\n d) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (Genr eId) REFERENCES "genres" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (MediaTypeId) REFERENCES "media types" (MediaType Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "pl aylist track"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEG CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, T ER NOT NULL,\r\n rackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE INDEX IFK EmployeeReportsTo ON "employees" (ReportsTo)\n \n\n===Additional Context \n\nIn the chinook database invoice means order\n In the \'customers\' table, address column names do not have \'Billi  $n\n$ ng\' prefix, \n e.g. country column name is \'country\', not \'BillingCou ntry\'\n \n\n===Response Guidelines \n1. If the provided context is suffi cient, please generate a valid SQL query without any explanations for the qu estion. \n2. If the provided context is almost sufficient but requires knowl edge of a specific string in a particular column, please generate an interme diate SQL query to find the distinct strings in that column. Prepend the que ry with a comment saying intermediate sql \n3. If the provided context is in sufficient, please explain why it can\'t be generated. \n4. Please use the m ost relevant table(s). \n5. If the question has been asked and answered befo re, please repeat the answer exactly as it was given before. \n'}, {'role': Find the top 5 customers who bought the 'user', 'content': ' \n most albums in total quantity (across all invoices):\n Hint: album qu antity is found in invoice items, \n '}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbu msBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\n JOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.Tra ckId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.Custo merId, c.FirstName, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Find the customer who bought the most albums in total quantity (across all invoices):'}, {'role': 'assistant', 'content': 'S ELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbums Bought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJO IN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.Track Id = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.Custome rId, c.FirstName, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1'}, {'role': 'user', 'content': ' Get the average invoice total for each custome r:'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c. LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJ0IN invoic es i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.L astName'}, {'role': 'user', 'content': 'Find the customer with the most invo ices '}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoi ces i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c. LastName\nORDER BY InvoiceCount DESC\nLIMIT 1'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust omerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName'}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'role': 'assis tant', 'content': 'SELECT c.Country, COUNT(i.InvoiceId) AS TotalInvoices\nFR OM customers  $c\n JOIN$  invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.C ountry'}, {'role': 'user', 'content': 'List all invoices with a total exceed ing \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM in voices WHERE Total > 10'}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nL IMIT 5'}, {'role': 'user', 'content': ' \n Can you find the top 10 mo st popular artists based on the number of tracks?\n Hint: There are 3

tables - artists, albums and tracks, \n where albums and artists are linked by ArtistId, albums and tracks are linked by AlbumId,\n '}, {'rol e': 'assistant', 'content': 'SELECT a.Name AS ArtistName, COUNT(t.TrackId) A S NumberOfTracks\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId \nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId, a.Name\nORDE R BY NumberOfTracks DESC\nLIMIT 10'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, Total \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': '\n Find the top 5 cus tomers who spent the most money overall, \n Hint: order total can b e found on invoices table, calculation using invoice\_items detail table is u nnecessary \n '}

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n InvoiceDate DATETIME NOT NULL.\r\n illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n BillingCou BillingPostalCode NVARCHAR(10),\r\n ntry NVARCHAR(40),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOIN CREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (I nvoiceId)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerId) \n\nCREATE INDEX IFK InvoiceLineTrackId ON \"invoice items\" (TrackId)\n\nCR EATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCR FirstName NVARCHAR(40) NOT NULL,\r\n EMENT NOT NULL,\r\n LastName NVA RCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n Address NVARCHAR(7  $0).\r\n$ City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVAR PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId I Fax NVARCHAR(24),\r\n NTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (Employee Id)  $\r\n\t\t$ 0N DELETE NO ACTION ON UPDATE NO ACTION $\r\n\$ 1n\nCREATE TABLE "eEmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL mployees\"\r\n(\r\n L,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) T NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n BirthDat Address NVARCHAR(70),\r\n e DATETIME,\r\n HireDate DATETIME,\r\n ty NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r\n Phone NVARCHAR(24), $\r\$ PostalCode NVARCHAR(10),\r\n Fax NVARCHAR(2 Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES \"e mployees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n) \n\nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGE

MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r\n oser NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) GER,\r\n REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACT FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON  $ION, \r\n$ DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFER ENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlist track\"\r\n(\r\n PlaylistId INTEGE TrackId INTEGER NOT NULL,\r\n R NOT NULL,\r\n CONSTRAINT PK Playlist Track PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) RE FERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t \t0N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK EmployeeR eportsTo ON \"employees\" (ReportsTo)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n In the 'customers' table, addr ess column names do not have 'Billing' prefix, \n e.g. country column nam e is 'country', not 'BillingCountry'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a valid SQL query withou t any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular colum n, please generate an intermediate SQL query to find the distinct strings in that column. Prepend the query with a comment saying intermediate sql \n3. I f the provided context is insufficient, please explain why it can't be gener ated. \n4. Please use the most relevant table(s). \n5. If the question has b een asked and answered before, please repeat the answer exactly as it was gi ven before. \n"}, {"role": "user", "content": " \n Find the top 5 customers who bought the most albums in total quantity (across all invoice s):\n Hint: album quantity is found in invoice items, \n "}, {"rol e": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, S UM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.Invoi ceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalAl bumsBought DESC\nLIMIT 5"}, {"role": "user", "content": "Find the customer w ho bought the most albums in total quantity (across all invoices):"}, {"rol e": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, S UM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.Invoi ceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalAl bumsBought DESC\nLIMIT 1"}, {"role": "user", "content": " Get the average in voice total for each customer:"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\n FROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName"}, {"role": "user", "content": "Find t he customer with the most invoices "}, {"role": "assistant", "content": "SEL ECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCoun t\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP B Y c.CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DESC\nLIMIT 1"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstNa me, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstNam e, c.LastName"}, {"role": "user", "content": "Find the total number of invoi ces per country"}, {"role": "assistant", "content": "SELECT c.Country, COUNT (i.InvoiceId) AS TotalInvoices\nFROM customers c\nJ0IN invoices i ON c.Custo

merId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content": "Lis t all invoices with a total exceeding \$10"}, {"role": "assistant", "conten t": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"role": "use "content": "Find the top 5 most expensive tracks (based on unit pric e):"}, {"role": "assistant", "content": "SELECT TrackId, Name, UnitPrice \nF ROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "conten t": " \n Can you find the top 10 most popular artists based on the nu mber of tracks?\n Hint: There are 3 tables - artists, albums and trac where albums and artists are linked by ArtistId, albums and tr acks are linked by AlbumId,\n "}, {"role": "assistant", "content": "SELEC T a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks\nFROM artists a\n JOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t. AlbumId\nGROUP BY a.ArtistId, a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 1 0"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Tota l \nFROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "c ontent": " \n Find the top 5 customers who spent the most money ove rall, \n Hint: order total can be found on invoices table, calculat ion using invoice items detail table is unnecessary \n

Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "invoices"\r\n(\r\n InvoiceId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL,\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingCou illingCity NVARCHAR(40),\r\n BillingState NVARCHAR(40),\r\n ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice items"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOINCR EMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL.\r\n FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE TABLE "customers"\r\n(\r\n CustomerId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n  $NVARCHAR(70), \r\n$ untry NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(2 Email NVARCHAR(60) NOT NULL,\r\n 4),\r\n Fax NVARCHAR(24),\r\n FOREIGN KEY (SupportRepId) REFERENCES "employees" portRepId INTEGER,\r\n (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK InvoiceLineInvoiceId ON "invoice items" (InvoiceId)\n\nCREATE TABL E "employees"\r\n(\r\n EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT N ULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARCHAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n ate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r\n Country NVARCHAR(40),\r Phone NVARCHAR(24), $\r\$ PostalCode NVARCHAR(10),\r\n Fax NVARCHA Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFERENCES R(24), r n"employees" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE INDEX IFK InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREA ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NO TE TABLE "artists"\r\n(\r\n T NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK InvoiceLineTrackI d ON "invoice items" (TrackId)\n\nCREATE TABLE "albums"\r\n(\r\n INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFER ENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r \n)\n\nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY KEY A Name  $NVARCHAR(120)\r\n)\n\n===Additional Con$ UTOINCREMENT NOT NULL,\r\n text \n\nIn the chinook database invoice means order\n\n\n In the \'custo mers\' table, address column names do not have \'Billing\' prefix, \n g. country column name is \'country\', not \'BillingCountry\'\n sponse Guidelines \n1. If the provided context is sufficient, please generat e a valid SQL query without any explanations for the question. \n2. If the p

rovided context is almost sufficient but requires knowledge of a specific st ring in a particular column, please generate an intermediate SQL query to fi nd the distinct strings in that column. Prepend the query with a comment say ing intermediate sql \n3. If the provided context is insufficient, please ex plain why it can\'t be generated. \n4. Please use the most relevant table (s). \n5. If the question has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': Find the top 5 customers who bought the most albums in tota l quantity (across all invoices):\n Hint: album quantity is found in '}, {'role': 'assistant', 'content': 'SELECT c.Customer invoice items, \n Id, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM cus tomers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJ OIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 5'}, {'role': 'user', 'co ntent': 'Find the customer who bought the most albums in total quantity (acr oss all invoices):'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM custome rs c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.L astName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1'}, {'role': 'user', 'conte nt': 'Find the customer with the most invoices '}, {'role': 'assistant', 'co ntent': 'SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Customer Id\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DE SC\nLIMIT 1'}, {'role': 'user', 'content': ' Get the average invoice total f or each customer:'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c. FirstName, c.LastName'}, {'role': 'user', 'content': "\n For the ques tion what are the top 5 countries that customers come from?, \n enerated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFR OM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELEC T BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY Bill ingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP B Y BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such column: B Please fix the error and re-generate the SQL\n illingCountry .\n "}, {'role': 'assistant', 'content': 'SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5'}, {'role': 'user', 'content': 'Get the total number of invoices for eac h customer'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.First Name, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJ0I N invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstN ame, c.LastName'}, {'role': 'user', 'content': 'Find the total number of inv oices per country'}, {'role': 'assistant', 'content': 'SELECT c.Country, COU NT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.Cus tomerId = i.CustomerId\nGROUP BY c.Country'}, {'role': 'user', 'content': "\n For the question which table stores customer's orders, \n the generated SQL statement invoices results in the following exception [ERR OR-SQL] the generated SQL : invoices\n does not starts with ('select','wit "}, {'r h') .\n Please fix the error and re-generate the SQL\n ole': 'assistant', 'content': 'SELECT \* FROM invoices'}, {'role': 'user', 'c ontent': 'List all invoices with a total exceeding \$10'}, {'role': 'assistan

t', 'content': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELECT TrackId, Name, Unit Price \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, {'role': 'user', 'content': '\n For the question \n Find the top 5 customers who spent the most money overall, \n Hint: order total can be found on invoices table, calculation using invoice items detail table is unnecessa ry \n the generated SQL statement None results in the followi ng exception [ERROR-SQL] Failed to generate SQL for prompt: d the top 5 customers who spent the most money overall, \n Hint: or der total can be found on invoices table, calculation using invoice items de tail table is unnecessary \n with the following exception: \ntimed out .\n Please fix the error and re-generate the SQL\n

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options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE \"invoices\"\r\n(\r\n InvoiceId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n CustomerId INTEGER NOT NULL.\r\n InvoiceDate DATETIME NOT NULL,\r\n BillingAddress NVARCHAR(70),\r\n BillingState NVARCHAR(40),\r\n illingCity NVARCHAR(40),\r\n BillingCou ntry NVARCHAR(40),\r\n BillingPostalCode NVARCHAR(10),\r\n Total NUMER IC(10,2) NOT NULL,\r\n FOREIGN KEY (CustomerId) REFERENCES \"customers\" (CustomerId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice items\"\r\n(\r\n InvoiceLineId INTEGER PRIMARY KEY AUTOIN CREMENT NOT NULL,\r\n InvoiceId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n Quantity INTEGER NOT NULL,\r\n FOREIGN KEY (InvoiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (TrackI d) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"customers\"\r\n(\r\n CustomerId INTEGER PRI MARY KEY AUTOINCREMENT NOT NULL,\r\n FirstName NVARCHAR(40) NOT NULL,\r LastName NVARCHAR(20) NOT NULL,\r\n Company NVARCHAR(80),\r\n ddress NVARCHAR(70),\r\n City NVARCHAR(40),\r\n State NVARCHAR(40),\r Country NVARCHAR(40),\r\n PostalCode NVARCHAR(10),\r\n Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n  $RCHAR(24), \r\n$ SupportRepId INTEGER,\r\n FOREIGN KEY (SupportRepId) REFERENCES \"employe es\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCR EATE INDEX IFK InvoiceLineInvoiceId ON \"invoice items\" (InvoiceId)\n\nCREA EmployeeId INTEGER PRIMARY KEY AUTOINCREM TE TABLE \"employees\"\r\n(\r\n ENT NOT NULL,\r\n LastName NVARCHAR(20) NOT NULL,\r\n FirstName NVARC HAR(20) NOT NULL,\r\n Title NVARCHAR(30),\r\n ReportsTo INTEGER,\r\n BirthDate DATETIME,\r\n HireDate DATETIME,\r\n Address NVARCHAR(70),\r State NVARCHAR(40),\r\n City NVARCHAR(40),\r\n Country NVARCHAR PostalCode NVARCHAR(10),\r\n Phone NVARCHAR(24),\r\n  $(40), \r\n$ Email NVARCHAR(60),\r\n FOREIGN KEY (ReportsTo) REFE  $NVARCHAR(24), \r\n$ RENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO A CTION\r\n)\n\nCREATE INDEX IFK InvoiceCustomerId ON \"invoices\" (CustomerI d)\n\nCREATE TABLE \"artists\"\r\n(\r\n ArtistId INTEGER PRIMARY KEY AUTO INCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK Invoi

ceLineTrackId ON \"invoice items\" (TrackId)\n\nCREATE TABLE \"albums\"\r\n AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n ARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlists\"\r\n(\r\n PlaylistId I NTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n$ \n\n===Additional Context \n\nIn the chinook database invoice means order\n In the 'customers' table, address column names do not have 'Billing'  $n\n$ e.g. country column name is 'country', not 'BillingCountry'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, pleas e generate a valid SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a spe cific string in a particular column, please generate an intermediate SQL que ry to find the distinct strings in that column. Prepend the query with a com ment saying intermediate sql \n3. If the provided context is insufficient, p lease explain why it can't be generated. \n4. Please use the most relevant t able(s). \n5. If the question has been asked and answered before, please rep eat the answer exactly as it was given before. \n"}, {"role": "user", "conte Find the top 5 customers who bought the most albums in total quantity (across all invoices):\n Hint: album quantity is found "}, {"role": "assistant", "content": "SELECT c.Custo in invoice items, \n merId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice it ems ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackI d\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstN ame, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 5"}, {"role": "use r", "content": "Find the customer who bought the most albums in total quanti ty (across all invoices):"}, {"role": "assistant", "content": "SELECT c.Cust omerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice it ems ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackI d\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstN ame, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1"}, {"role": "use r", "content": "Find the customer with the most invoices "}, {"role": "assis tant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.Inv oiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY Invoi ceCount DESC\nLIMIT 1"}, {"role": "user", "content": " Get the average invoi ce total for each customer:"}, {"role": "assistant", "content": "SELECT c.Cu stomerId, c.FirstName, c.LastName, AVG(i.Total) AS AverageInvoiceTotal\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.Cust omerId, c.FirstName, c.LastName"}, {"role": "user", "content": "\n r the question what are the top 5 countries that customers come from?, \n the generated SQL statement SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nL IMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGROUP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5\n Execution failed on sql 'SELECT BillingCountry, COUNT(\*) as CustomerCount \nFROM customers \nGRO UP BY BillingCountry \nORDER BY CustomerCount DESC \nLIMIT 5': no such colum n: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT Country, COUNT(\*) AS CustomerCo unt \nFROM customers \nGROUP BY Country \nORDER BY CustomerCount DESC \nLIMI T 5"}, {"role": "user", "content": "Get the total number of invoices for eac h customer"}, {"role": "assistant", "content": "SELECT c.CustomerId, c.First Name, c.LastName, COUNT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJ0I

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N invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstN
 ame, c.LastName"}, {"role": "user", "content": "Find the total number of inv
 oices per country"}, {"role": "assistant", "content": "SELECT c.Country, COU
NT(i.InvoiceId) AS TotalInvoices\nFROM customers c\nJOIN invoices i ON c.Cus
 tomerId = i.CustomerId\nGROUP BY c.Country"}, {"role": "user", "content":
 For the question which table stores customer's orders, \n
 "\n
 the generated SQL statement invoices results in the following exception [ERR
OR-SQL] the generated SQL : invoices\n does not starts with ('select','wit
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 unit price):"}, {"role": "assistant", "content": "SELECT TrackId, Name, Unit
 Price \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user",
 "content": "\n
 For the question \n
 Find the top 5 customers
who spent the most money overall, \n
 Hint: order total can be found
 on invoices table, calculation using invoice items detail table is unnecessa
 the generated SQL statement None results in the followi
 ng exception [ERROR-SQL] Failed to generate SQL for prompt:
 d the top 5 customers who spent the most money overall, \n
 Hint: or
der total can be found on invoices table, calculation using invoice items de
 tail table is unnecessary \n
 with the following exception: \ntimed out
 .\n
 Please fix the error and re-generate the SQL\n
 "}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:49:19.226868324Z', 'me
 ssage': {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName,
 c.LastName, SUM(i.Total) AS TotalSpent\nFROM customers c\nJOIN invoices i ON
 c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName
 \nORDER BY TotalSpent DESC\nLIMIT 5'}, 'done reason': 'stop', 'done': True,
 'total duration': 235328467144, 'load duration': 74192663, 'prompt eval coun
 t': 1938, 'prompt eval duration': 210795433000, 'eval count': 59, 'eval dura
tion': 22380767000}
 [(LLM Response)]
 SELECT c.CustomerId, c.FirstName, c.LastName, SUM(i.Total) AS TotalSpent
 FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.CustomerId, c.FirstName, c.LastName
ORDER BY TotalSpent DESC
LIMIT 5
 [(SQL)]
 generated SQL statement
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(i.Total) AS TotalSpent
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.Customerld, c.FirstName, c.LastName
ORDER BY TotalSpent DESC
LIMIT 5
 [(DATA)]
 queried data frame
```

	CustomerId	FirstName	LastName	TotalSpent
0	6	Helena	Holý	49.62
1	26	Richard	Cunningham	47.62
2	57	Luis	Rojas	46.62
3	45	Ladislav	Kovács	45.62
4	46	Hugh	O'Reilly	45.62

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep\_alive=None

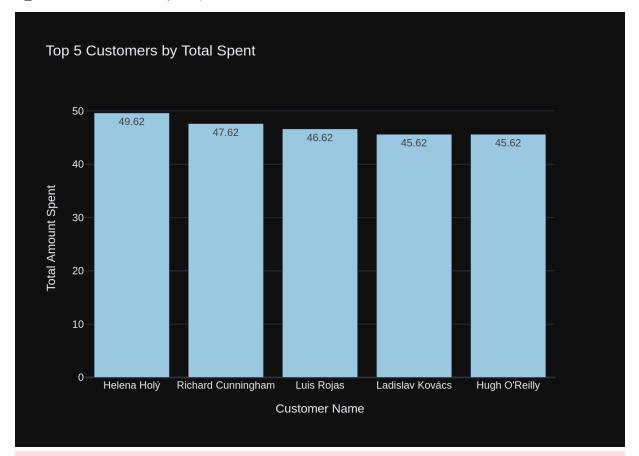
[( Prompt Content )]

[{"role": "system", "content": "The following is a pandas DataFrame that con tains the results of the query that answers the question the user asked: '\n Find the top 5 customers who spent the most mo For the question \n ney overall, \n Hint: order total can be found on invoices table, c alculation using invoice items detail table is unnecessary \n the generated SQL statement None results in the following exception [ERROR-S QL] Failed to generate SQL for prompt: \n Find the top 5 customers who spent the most money overall, \n Hint: order total can be found on invoices table, calculation using invoice items detail table is unnecessa with the following exception: \ntimed out .\n Please fix th e error and re-generate the SQL\n '\n\nThe DataFrame was produced usi ng this query: SELECT c.CustomerId, c.FirstName, c.LastName, SUM(i.Total) AS TotalSpent\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId \nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalSpent DESC\n LIMIT 5\n\nThe following is information about the resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n CustomerId int64\nFirstName ect\nLastName float64\ndtype: object"}, {"role": object\nTotalSpent "user", "content": "Can you generate the Python plotly code to chart the res ults of the dataframe? Assume the data is in a pandas dataframe called 'df'. If there is only one value in the dataframe, use an Indicator. Respond with only Python code. Do not answer with any explanations -- just the code."}]

[( Ollama Response )] {'model': 'qwen2.5:14b', 'created\_at': '2024-10-13T00:50:39.642525085Z', 'me ssage': {'role': 'assistant', 'content': 'import plotly.graph objects as go \n\nif len(df) == 1:\n fig = go.Figure(go.Indicator(mode="number", value= df[\'TotalSpent\'].iloc[0]))\nelse:\n fig = go.Figure(go.Bar(x=df[\'First Name' + ' + df['LastName'], y=df['TotalSpent'], n $text=df[\'TotalSpent'].apply(lambda x: f\'{x:.2f}\'),\n$ textposition=\'auto\',\n marker=dict(color=\'rgb(1 58,202,225)\'),\n orientation=\'v\'))\n ate layout(title=\'Top 5 Customers by Total Spent\', xaxis title=\'Customer Name\', yaxis title=\'Total Amount Spent\')\n\nfig.show()'}, 'done reason': 'stop', 'done': True, 'total duration': 80383603665, 'load duration': 124765 99, 'prompt eval count': 335, 'prompt eval duration': 30062140000, 'eval cou nt': 155, 'eval duration': 50176937000}

[( PYTHON )]
generated Plotly code

## import plotly.graph\_objects as go



Number of requested results 10 is greater than number of elements in index 2, updating n results = 2

\_\_\_\_\_\_

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# QUESTION - 24: Get all playlists containing at least 10 tracks and the to tal duration of those tracks:

\_\_\_\_\_

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#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK\_PlaylistTrackTrackId ON "playlist\_track" (TrackId)\n\nCREATE TABLE "playlists"\r\n(\r\n PlaylistId INTEGER PRIMARY Name NVARCHAR(120)\r\n)\n\nCREATE TABLE KEY AUTOINCREMENT NOT NULL,\r\n "playlist track"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId IN TEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistI d, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (Playlis tid) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n ackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE N 0 ACTION\r\n)\n\nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY K EY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n MediaTypeId INTEGER NOT NULL,\r\n Id INTEGER,\r\n GenreId INTEGER,\r Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bvtes INTEGER.\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n E NO ACTION,\r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n \nCREATE INDEX IFK TrackAlbumId ON "tracks" (AlbumId)\n\nCREATE INDEX IFK Tr ackMediaTypeId ON "tracks" (MediaTypeId)\n\nCREATE INDEX IFK AlbumArtistId O N "albums" (ArtistId)\n\nCREATE TABLE "albums"\r\n(\r\n AlbumId INTEGER P RIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES "artist s" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL TABLE "genres"\r\n(\r\n Name  $NVARCHAR(120)\r\n)\n\n==Additional Context \n\nIn the chin$ ook database invoice means order\n\n In the \'customers\' table, addres s column names do not have \'Billing\' prefix, \n e.g. country column nam e is \'country\', not \'BillingCountry\'\n \n\n===Response Guidelines \n 1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is a lmost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strin gs in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can\'t b e generated. \n4. Please use the most relevant table(s). \n5. If the questio n has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': 'List all genres and the number of tracks in each genre:'}, {'role': 'assistant', 'content': 'SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.Name'}, {'role': 'user', 'cont Can you find the top 10 most popular artists based on the ent': '\n number of tracks?\n Hint: There are 3 tables - artists, albums and tr where albums and artists are linked by ArtistId, albums and acks, \n

tracks are linked by AlbumId,\n '}, {'role': 'assistant', 'content': 'SEL ECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks\nFROM artists a \nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId, a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, {'role': 'user', 'content': 'Find all tracks with a name containing "W hat" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT TrackI d, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'con tent': 'Find the customer who bought the most albums in total quantity (acro ss all invoices):'}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM custome rs c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.L astName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1'}, {'role': 'user', 'conte nt': 'Find the top 5 most expensive tracks (based on unit price):'}, {'rol e': 'assistant', 'content': 'SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, {'role': 'user', 'content': ' Find the top 5 customers who bought the most albums in total quantity (acros Hint: album quantity is found in invoice items, \n s all invoices):\n '}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.La stName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoic es i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.A lbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER B Y TotalAlbumsBought DESC\nLIMIT 5'}, {'role': 'user', 'content': 'List all a lbums and their corresponding artist names '}, {'role': 'assistant', 'conte nt': 'SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \n JOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'as sistant', 'content': "SELECT InvoiceId, Total \nFROM invoices \nWHERE Invoic eDate >= '2010-01-01'"}, {'role': 'user', 'content': 'List all invoices with a total exceeding \$10'}, {'role': 'assistant', 'content': 'SELECT InvoiceId, Total FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'assistant', 'co ntent': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'us er', 'content': 'Get all playlists containing at least 10 tracks and the tot al duration of those tracks:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE INDEX IFK PlaylistTrackTrackId ON \"playlist track \" (TrackId)\n\nCREATE TABLE \"playlists\"\r\n(\r\n PlaylistId INTEGER PR IMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\nCREATE T$ ABLE \"playlist track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n ckId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (Pla ylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER

PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n AlbumId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGE Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n  $R_{r} r n$ Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPD FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) ATE NO ACTION,\r\n \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTy peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O N UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackGenreId ON \"tracks\" (Genr X IFK TrackMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCREATE INDEX IFK Album ArtistId ON \"albums\" (ArtistId)\n\nCREATE TABLE \"albums\"\r\n(\r\n umId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) R EFERENCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO AC TION\r\n)\n\nCREATE TABLE \"genres\"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name  $NVARCHAR(120)\r\n)\n\n===Additional Co$ ntext \n\nIn the chinook database invoice means order\n\n\n In the 'custo mers' table, address column names do not have 'Billing' prefix, \n ountry column name is 'country', not 'BillingCountry'\n  $\n\n===Response G$ uidelines \n1. If the provided context is sufficient, please generate a vali d SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the d istinct strings in that column. Prepend the query with a comment saying inte rmediate sql \n3. If the provided context is insufficient, please explain wh y it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer ex actly as it was given before. \n"}, {"role": "user", "content": "List all ge nres and the number of tracks in each genre:"}, {"role": "assistant", "conte nt": "SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM g enres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.Name"}, {"role": "user", "content": " \n Can you find the top 10 most popular artists based on the number of tracks?\n Hint: There are 3 tables - artists, albums and tracks, \n where albums and artists are linked by ArtistI d, albums and tracks are linked by AlbumId,\n "}, {"role": "assistant", "content": "SELECT a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks \nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId, a.Name\nORDER BY NumberOfTra cks DESC\nLIMIT 10"}, {"role": "user", "content": "Find all tracks with a na me containing \"What\" (case-insensitive) "}, {"role": "assistant", "conten t": "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"r ole": "user", "content": "Find the customer who bought the most albums in to tal quantity (across all invoices):"}, {"role": "assistant", "content": "SEL ECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBo ught\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerI d, c.FirstName, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1"}, {"ro le": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "content": "SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5"}, {"role": "user", "conte Find the top 5 customers who bought the most albums in total quantity (across all invoices):\n Hint: album quantity is found "}, {"role": "assistant", "content": "SELECT c.Custo in invoice items, \n merId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM

customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice it ems ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackI d\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstN ame, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 5"}, {"role": "use r", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTitle, ar.Name AS A rtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find all invoices since 2010 and the total amou nt invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Total \n FROM invoices \nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "conte nt": "List all invoices with a total exceeding \$10"}, {"role": "assistant", "content": "SELECT InvoiceId, Total FROM invoices WHERE Total > 10"}, {"rol e": "user", "content": "Can you list all tables in the SQLite database catal og?"}, {"role": "assistant", "content": "SELECT name FROM sqlite master WHER E type = 'table'"}, {"role": "user", "content": "Get all playlists containin q at least 10 tracks and the total duration of those tracks:"}] [( Ollama Response )] {'model': 'gwen2.5:14b', 'created at': '2024-10-13T00:53:54.687179419Z', 'me ssage': {'role': 'assistant', 'content': 'SELECT p.PlaylistId, p.Name, COUNT (pt.TrackId) AS TotalTracks, SUM(t.Milliseconds) / 1000 AS TotalDurationInSe conds $\nFROM$  playlists  $p\nJOIN$  playlist track pt ON p.PlaylistId = pt.PlaylistId\nJOIN tracks t ON pt.TrackId = t.TrackId\nGROUP BY p.PlaylistId, p.Name \nHAVING COUNT(pt.TrackId) >= 10'}, 'done\_reason': 'stop', 'done': True, 'to tal duration': 194961682995, 'load duration': 12663097, 'prompt eval count': 1431, 'prompt eval duration': 161723831000, 'eval count': 87, 'eval duratio n': 31521322000} [( LLM Response )] SELECT p.PlaylistId, p.Name, COUNT(pt.TrackId) AS TotalTracks, SUM(t.Millise conds) / 1000 AS TotalDurationInSeconds FROM playlists p JOIN playlist track pt ON p.PlaylistId = pt.PlaylistId JOIN tracks t ON pt.TrackId = t.TrackId GROUP BY p.PlaylistId, p.Name HAVING COUNT(pt.TrackId) >= 10 [( SQL )] generated SQL statement SELECT p.PlaylistId, p.Name, COUNT(pt.TrackId) AS TotalTracks, SUM(t.Milliseconds) / 1000 **AS** TotalDurationInSeconds **FROM** playlists p

AS TotalDurationInSeconds

FROM playlists p

JOIN playlist\_track pt ON p.PlaylistId = pt.PlaylistId

JOIN tracks t ON pt.TrackId = t.TrackId

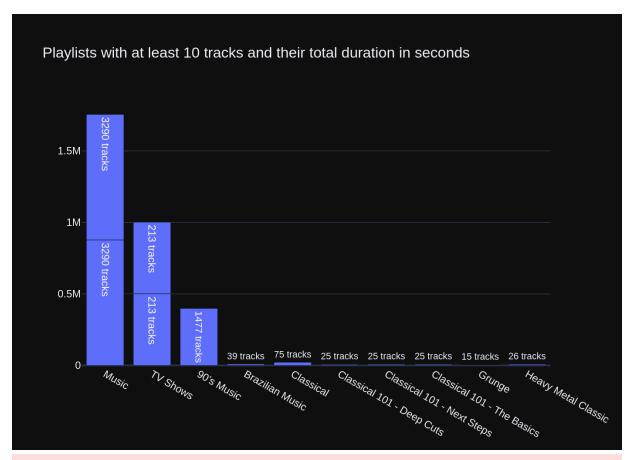
GROUP BY p.PlaylistId, p.Name

HAVING COUNT(pt.TrackId) >= 10

[( DATA )]
queried data frame

	PlaylistId	Name	TotalTracks	TotalDurationInSeconds
0	1	Music	3290	877683
1	3	TV Shows	213	501094
2	5	90's Music	1477	398705
3	8	Music	3290	877683
4	10	TV Shows	213	501094
5	11	Brazilian Music	39	9486
6	12	Classical	75	21770
7	13	Classical 101 - Deep Cuts	25	6755
8	14	Classical 101 - Next Steps	25	7575
9	15	Classical 101 - The Basics	25	7439
10	16	Grunge	15	4122
11	17	Heavy Metal Classic	26	8206

```
[Ollama parameters]
model=qwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Ge
 t all playlists containing at least 10 tracks and the total duration of thos
e tracks: '\n\nThe DataFrame was produced using this query: SELECT p.Playlist
 Id, p.Name, COUNT(pt.TrackId) AS TotalTracks, SUM(t.Milliseconds) / 1000 AS
TotalDurationInSeconds\nFROM playlists p\nJOIN playlist track pt ON p.Playli
 stId = pt.PlaylistId\nJOIN tracks t ON pt.TrackId = t.TrackId\nGROUP BY p.Pl
 aylistId, p.Name\nHAVING COUNT(pt.TrackId) >= 10\n\nThe following is informa
 tion about the resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n
 PlaylistId
 int64\nName
 object\nTotalTra
 int64\ndtype: object"},
 cks
 int64\nTotalDurationInSeconds
 {"role": "user", "content": "Can you generate the Python plotly code to char
 t the results of the dataframe? Assume the data is in a pandas dataframe cal
 led 'df'. If there is only one value in the dataframe, use an Indicator. Res
 pond with only Python code. Do not answer with any explanations -- just the
 code."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created_at': '2024-10-13T00:54:53.317398003Z', 'me
 ssage': {'role': 'assistant', 'content': 'import plotly.graph objects as go
 fig = go.Figure(go.Indicator(mode="number", value=
 \n \in \n
df[\'TotalTracks\'].iloc[0], number={\'suffix\': " Tracks"}))\nelse:\n
g = go.Figure(go.Bar(x=df[\'Name'], y=df[\'TotalDurationInSeconds'], text=
df[\'TotalTracks\'], textposition=\'auto\', texttemplate=\'%{text} tracks
\'))\nfig.update layout(title=\'Playlists with at least 10 tracks and their
 total duration in seconds\')\nfig.show()'}, 'done reason': 'stop', 'done': T
 rue, 'total duration': 58582748989, 'load duration': 14830837, 'prompt eval
 count': 256, 'prompt eval duration': 22127021000, 'eval count': 113, 'eval d
 uration': 36305814000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objects as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode="number", value=df['TotalTracks'].iloc[0], number={'suff
ix': " Tracks"}))
else:
 fig = qo.Figure(qo.Bar(x=df['Name'], y=df['TotalDurationInSeconds'], text=df['TotalTracks'],
textposition='auto', texttemplate='%{text} tracks'))
fig.update layout(title='Playlists with at least 10 tracks and their total duration in seconds')
```



Number of requested results 10 is greater than number of elements in index 2, updating  $n_results = 2$ 

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# QUESTION - 25: Identify artists who have albums with tracks appearing in multiple genres:

\_\_\_\_\_\_

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#### [( SQL Prompt )]

[{'role': 'system', 'content': 'You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructi ons. \n===Tables \nCREATE TABLE "tracks"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(200) NOT NULL,\r\n mId INTEGER,\r\n MediaTypeId INTEGER NOT NULL,\r\n GenreId INTEGER,\r Composer NVARCHAR(220),\r\n Milliseconds INTEGER NOT NULL,\r\n Bytes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDAT FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n E NO ACTION,\r\n \t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeI d) REFERENCES "media types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON "albums" (ArtistId) \n\nCREATE INDEX IFK TrackGenreId ON "tracks" (GenreId)\n\nCREATE INDEX IFK TrackAlbumId ON "tracks" (AlbumId)\n\nCREATE TABLE "albums"\r\n(\r\n mId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Title NVARCHAR(160) ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) R EFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTI ON\r\n)\n\nCREATE INDEX IFK TrackMediaTypeId ON "tracks" (MediaTypeId)\n\nCR EATE TABLE "genres"\r\n(\r\n GenreId INTEGER PRIMARY KEY AUTOINCREMENT NO T NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK PlaylistTrackTrac kId ON "playlist track" (TrackId)\n\nCREATE TABLE "artists"\r\n(\r\n stId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r \n)\n\nCREATE TABLE "playlist track"\r\n(\r\n PlaylistId INTEGER NOT NUL TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIM  $L,\r\n$ ARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chi nook database invoice means order\n\n
In the \'customers\' table, addre ss column names do not have \'Billing\' prefix, \n e.g. country column na me is \'country\', not \'BillingCountry\'\n \n\n===Response Guidelines \n 1. If the provided context is sufficient, please generate a valid SQL query without any explanations for the question. \n2. If the provided context is a lmost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the distinct strin gs in that column. Prepend the query with a comment saying intermediate sql \n3. If the provided context is insufficient, please explain why it can\'t b e generated. \n4. Please use the most relevant table(s). \n5. If the questio n has been asked and answered before, please repeat the answer exactly as it was given before. \n'}, {'role': 'user', 'content': ' \n Can you find the top 10 most popular artists based on the number of tracks?\n Hin t: There are 3 tables - artists, albums and tracks, \n where albums a nd artists are linked by ArtistId, albums and tracks are linked by AlbumI '}, {'role': 'assistant', 'content': 'SELECT a.Name AS ArtistName, C OUNT(t.TrackId) AS NumberOfTracks\nFROM artists a\nJOIN albums al ON a.Artis tId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.Artis

tId, a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, {'role': 'user', 'con tent': 'List all genres and the number of tracks in each genre:'}, {'role': 'assistant', 'content': 'SELECT q.Name AS GenreName, COUNT(t.TrackId) AS Num berOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.Name'}, {'role': 'user', 'content': 'List all albums and their correspondi ng artist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS Alb umTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.Artist Id = ar.ArtistId'}, {'role': 'user', 'content': 'Find the customer who bough t the most albums in total quantity (across all invoices):'}, {'role': 'assi stant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Qua ntity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.Customer Id = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId \nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalAlbumsBought DESC\nLIMIT 1'}, {'role': 'user', 'content': ' \n Find the top 5 customers who bought the most albums in total quantity (across all invoice Hint: album quantity is found in invoice items, \n e': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastName, S UM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.Invoi ceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalAl bumsBought DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Get all playlists c ontaining at least 10 tracks and the total duration of those tracks:'}, {'ro le': 'assistant', 'content': 'SELECT p.PlaylistId, p.Name, COUNT(pt.TrackId) AS TotalTracks, SUM(t.Milliseconds) / 1000 AS TotalDurationInSeconds\nFROM p laylists p\nJOIN playlist track pt ON p.PlaylistId = pt.PlaylistId\nJOIN tra cks t ON pt.TrackId = t.TrackId\nGROUP BY p.PlaylistId, p.Name\nHAVING COUNT (pt.TrackId) >= 10'}, {'role': 'user', 'content': 'Find the top 5 most expen sive tracks (based on unit price):'}, {'role': 'assistant', 'content': 'SELE CT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DESC \nLIMIT 5'}, {'role': 'user', 'content': 'Find all tracks with a name containing "Wh at" (case-insensitive) '}, {'role': 'assistant', 'content': "SELECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'conten t': 'Can you list all tables in the SQLite database catalog?'}, {'role': 'as sistant', 'content': "SELECT name FROM sqlite master WHERE type = 'table'"}, {'role': 'user', 'content': 'Find the customer with the most invoices '}, {'role': 'assistant', 'content': 'SELECT c.CustomerId, c.FirstName, c.LastNa me, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName \nORDER BY InvoiceCount DESC\nLIMIT 1'}, {'role': 'user', 'content': 'Identi fy artists who have albums with tracks appearing in multiple genres:'}]

[Ollama parameters]
model=qwen2.5:14b,
options={},
keep\_alive=None

[( Prompt Content )]

[{"role": "system", "content": "You are a SQLite expert. Please help to gene rate a SQL query to answer the question. Your response should ONLY be based on the given context and follow the response guidelines and format instructions.  $\n==$ Tables  $\nCREATE$  TABLE  $\"tracks"\r\n(\r\n$  TrackId INTEGER PRIMA RY KEY AUTOINCREMENT NOT NULL, $\r\n$  Name NVARCHAR(200) NOT NULL, $\r\n$  A lbumId INTEGER, $\r\n$  MediaTypeId INTEGER NOT NULL, $\r\n$  GenreId INTEGE R, $\r\n$  Composer NVARCHAR(220), $\r\n$  Milliseconds INTEGER NOT NULL, $\r\n$ 

Bvtes INTEGER,\r\n UnitPrice NUMERIC(10,2) NOT NULL,\r\n FOREIGN KEY (Albumid) REFERENCES \"albums\" (Albumid) \r\n\t\tON DELETE NO ACTION ON UPD ATE NO ACTION,\r\n FOREIGN KEY (GenreId) REFERENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTy peId) REFERENCES \"media types\" (MediaTypeId) \r\n\t\t0N DELETE NO ACTION 0 N UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK AlbumArtistId ON \"albums\" (Art istId)\n\nCREATE INDEX IFK TrackGenreId ON \"tracks\" (GenreId)\n\nCREATE IN DEX IFK TrackAlbumId ON \"tracks\" (AlbumId)\n\nCREATE TABLE \"albums\"\r\n Albumid INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n ARCHAR(160) NOT NULL,\r\n ArtistId INTEGER NOT NULL,\r\n FOREIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK TrackMediaTypeId ON \"tracks\" (Me diaTypeId)\n\nCREATE TABLE \"genres\"\r\n(\r\n GenreId INTEGER PRIMARY KE Y AUTOINCREMENT NOT NULL,\r\n Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK PlaylistTrackTrackId ON \"playlist track\" (TrackId)\n\nCREATE TABLE \"arti ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n  $sts\"\r\n(\r\n$ Name  $NVARCHAR(120)\r\n)\n\CREATE TABLE \"playlist track\"\r\n(\r\n$ istId INTEGER NOT NULL,\r\n TrackId INTEGER NOT NULL,\r\n CONSTRAINT PK PlaylistTrack PRIMARY KEY (PlaylistId, TrackId),\r\n FOREIGN KEY (Pla ylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON DELETE NO ACTION O FOREIGN KEY (TrackId) REFERENCES \"tracks\" (Trac N UPDATE NO ACTION,\r\n kId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n===Additional Context \n\nIn the chinook database invoice means order\n\n\n In the 'cus tomers' table, address column names do not have 'Billing' prefix, \n country column name is 'country', not 'BillingCountry'\n \n\n===Response Guidelines \n1. If the provided context is sufficient, please generate a val id SQL query without any explanations for the question. \n2. If the provided context is almost sufficient but requires knowledge of a specific string in a particular column, please generate an intermediate SQL query to find the d istinct strings in that column. Prepend the query with a comment saying inte rmediate sql \n3. If the provided context is insufficient, please explain wh y it can't be generated. \n4. Please use the most relevant table(s). \n5. If the question has been asked and answered before, please repeat the answer ex actly as it was given before. \n"}, {"role": "user", "content": " \n Can you find the top 10 most popular artists based on the number of tracks? Hint: There are 3 tables - artists, albums and tracks, \n here albums and artists are linked by ArtistId, albums and tracks are linked bv AlbumId.\n "}, {"role": "assistant", "content": "SELECT a.Name AS Arti stName, COUNT(t.TrackId) AS NumberOfTracks\nFROM artists a\nJOIN albums al 0 N a.ArtistId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP B Y a.ArtistId, a.Name\nORDER BY NumberOfTracks DESC\nLIMIT 10"}, {"role": "us er", "content": "List all genres and the number of tracks in each genre:"}, {"role": "assistant", "content": "SELECT g.Name AS GenreName, COUNT(t.TrackI d) AS NumberOfTracks\nFROM genres g\nJOIN tracks t ON g.GenreId = t.GenreId \nGROUP BY g.Name"}, {"role": "user", "content": "List all albums and their corresponding artist names "}, {"role": "assistant", "content": "SELECT a.T itle AS AlbumTitle, ar.Name AS ArtistName \nFROM albums a \nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": "Find the custome r who bought the most albums in total quantity (across all invoices):"}, {"r ole": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.Invoi ceId\nJOIN tracks t ON ii.TrackId = t.TrackId\nJOIN albums al ON t.AlbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY TotalAl bumsBought DESC\nLIMIT 1"}, {"role": "user", "content": " d the top 5 customers who bought the most albums in total quantity (across a

ll invoices):\n Hint: album quantity is found in invoice items, \n "}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstName, c.La stName, SUM(ii.Quantity) AS TotalAlbumsBought\nFROM customers c\nJOIN invoic es i ON c.CustomerId = i.CustomerId\nJOIN invoice items ii ON i.InvoiceId = ii.InvoiceId\nJ0IN tracks t ON ii.TrackId = t.TrackId\nJ0IN albums al ON t.A lbumId = al.AlbumId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER B Y TotalAlbumsBought DESC\nLIMIT 5"}, {"role": "user", "content": "Get all pl aylists containing at least 10 tracks and the total duration of those track s:"}, {"role": "assistant", "content": "SELECT p.PlaylistId, p.Name, COUNT(p t.TrackId) AS TotalTracks, SUM(t.Milliseconds) / 1000 AS TotalDurationInSeco nds\nFROM playlists p\nJOIN playlist track pt ON p.PlaylistId = pt.PlaylistI d\nJOIN tracks t ON pt.TrackId = t.TrackId\nGROUP BY p.PlaylistId, p.Name\nH AVING COUNT(pt.TrackId) >= 10"}, {"role": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "conte nt": "SELECT TrackId, Name, UnitPrice \nFROM tracks \nORDER BY UnitPrice DES C \nLIMIT 5"}, {"role": "user", "content": "Find all tracks with a name cont aining \"What\" (case-insensitive) "}, {"role": "assistant", "content": "SEL ECT TrackId, Name FROM tracks WHERE LOWER(Name) LIKE '%what%'"}, {"role": "u ser", "content": "Can you list all tables in the SQLite database catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqlite master WHERE type = 'table'"}, {"role": "user", "content": "Find the customer with the most in voices "}, {"role": "assistant", "content": "SELECT c.CustomerId, c.FirstNam e, c.LastName, COUNT(i.InvoiceId) AS InvoiceCount\nFROM customers c\nJOIN in voices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId, c.FirstName, c.LastName\nORDER BY InvoiceCount DESC\nLIMIT 1"}, {"role": "user", "conten t": "Identify artists who have albums with tracks appearing in multiple genr es:"}]

[( Ollama Response )]
{'model': 'qwen2.5:14b', 'created\_at': '2024-10-13T00:58:21.378363422Z', 'me
ssage': {'role': 'assistant', 'content': 'SELECT DISTINCT a.ArtistId, a.Name
\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t
ON al.AlbumId = t.AlbumId\nJOIN genres g ON t.GenreId = g.GenreId\nGROUP BY
a.ArtistId, al.AlbumId\nHAVING COUNT(DISTINCT g.Name) > 1'}, 'done\_reason':
'stop', 'done': True, 'total\_duration': 207954714500, 'load\_duration': 12692
263, 'prompt\_eval\_count': 1531, 'prompt\_eval\_duration': 176461571000, 'eval\_
count': 81, 'eval duration': 29785179000}

[( LLM Response )]
SELECT DISTINCT a.ArtistId, a.Name
FROM artists a
JOIN albums al ON a.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
JOIN genres g ON t.GenreId = g.GenreId
GROUP BY a.ArtistId, al.AlbumId
HAVING COUNT(DISTINCT g.Name) > 1

[( SQL )] generated SQL statement **SELECT DISTINCT** a.ArtistId, a.Name

FROM artists a

JOIN albums al ON a.ArtistId = al.ArtistId

JOIN tracks t ON al.AlbumId = t.AlbumId

JOIN genres g ON t.Genreld = g.Genreld

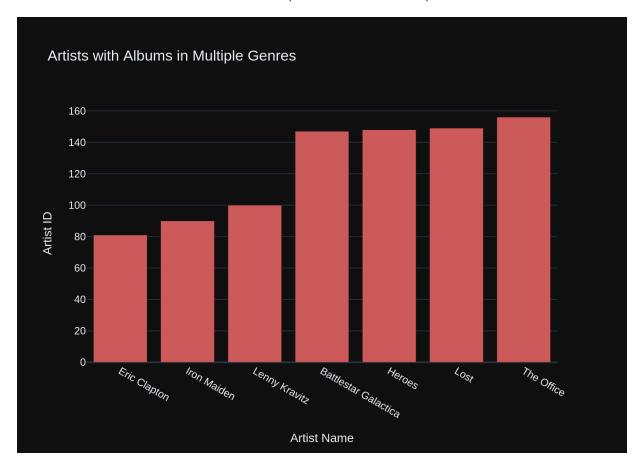
**GROUP BY** a.ArtistId, al.AlbumId

**HAVING COUNT(DISTINCT g.**Name) > 1

[( DATA )]
queried data frame

	ArtistId	Name
0	81	Eric Clapton
1	90	Iron Maiden
2	100	Lenny Kravitz
3	147	Battlestar Galactica
4	148	Heroes
5	149	Lost
6	156	The Office

```
[Ollama parameters]
model=gwen2.5:14b,
 options={},
 keep alive=None
 [(Prompt Content)]
 [{"role": "system", "content": "The following is a pandas DataFrame that con
 tains the results of the query that answers the question the user asked: 'Id
 entify artists who have albums with tracks appearing in multiple genres: '\n
 \nThe DataFrame was produced using this query: SELECT DISTINCT a.ArtistId,
 a.Name\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tra
 cks t ON al.AlbumId = t.AlbumId\nJOIN genres q ON t.GenreId = q.GenreId\nGRO
UP BY a.ArtistId, al.AlbumId\nHAVING COUNT(DISTINCT q.Name) > 1\n\nThe follo
wing is information about the resulting pandas DataFrame 'df': \nRunning df.
dtypes gives:\n ArtistId
 object\ndtype: object"}, {"r
 int64\nName
ole": "user", "content": "Can you generate the Python plotly code to chart t
he results of the dataframe? Assume the data is in a pandas dataframe called
 'df'. If there is only one value in the dataframe, use an Indicator. Respond
with only Python code. Do not answer with any explanations -- just the cod
e."}]
 [(Ollama Response)]
 {'model': 'qwen2.5:14b', 'created at': '2024-10-13T00:59:13.643715822Z', 'me
 ssage': {'role': 'assistant', 'content': "import plotly.graph objs as go\n\n
 if len(df) == 1:\n fig = go.Figure(go.Indicator(mode='number', value=df
 ['ArtistId'].iloc[0]))\nelse:\n
 fig = go.Figure(data=[go.Bar(x=df['Nam
e'], y=df['ArtistId'], marker color='indianred')])\n
 \nfig.update layout
 (title='Artists with Albums in Multiple Genres', xaxis title='Artist Name',
yaxis title='Artist ID')\nfig.show()"}, 'done reason': 'stop', 'done': True,
 'total duration': 52233479226, 'load duration': 10857232, 'prompt eval coun
 t': 230, 'prompt eval duration': 19843117000, 'eval count': 102, 'eval durat
 ion': 32252272000}
 [(PYTHON)]
 generated Plotly code
import plotly.graph objs as go
if len(df) == 1:
 fig = go.Figure(go.Indicator(mode='number', value=df['ArtistId'].iloc[0]))
 fig = qo.Figure(data=[go.Bar(x=df['Name'], y=df['ArtistId'], marker color='indianred')])
fig.update layout(title='Artists with Albums in Multiple Genres', xaxis title='Artist Name', yax
is title='Artist ID')
```



## Check completion time

# Save training data

```
In [18]: # show training data
 df_training_data = vn.get_training_data()
 df_training_data
```

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	id	question	content	training_data_type
0	0635a8fa-d5d1- 568f-a68d- 76578fe09510- sql	List all customers from Canada and their email	SELECT CustomerId, FirstName, LastName, Email 	sql
1	12139b77-b8dd- 5525-9c79- d68986c652af-sql	\n For the question \n Find t	SELECT c.CustomerId, c.FirstName, c.LastName,	sql
2	2d5184ce-e34e- 5610-ab68- e6209ea6c763- sql	List all employees and their reporting manager	SELECT e1.EmployeeId, e1.FirstName    ' '    e	sql
3	53218464-9901- 50ba-b4df- d1c11a6de761- sql	Get all playlists containing at least 10 track	SELECT p.PlaylistId, p.Name, COUNT(pt.TrackId)	sql
4	55b1a26d-72ce- 5fe7-8f7d- 4708f7c7dddc-sql	Find the top 5 most expensive tracks (based on	SELECT TrackId, Name, UnitPrice \nFROM tracks	sql
5	70a70d33-31e3- 56b2-9303- 6e6506a456d8- sql	Find all invoices since 2010 and the total amo	SELECT InvoiceId, Total \nFROM invoices \nWHER	sql
6	73178a89-0392- 52fe-ae53- a3ae4a0e76dd- sql	\n For the question what are the top 5	SELECT Country, COUNT(*) AS CustomerCount \nFR	sql
7	77f42233-4efd- 5644-bcb5- 5cfb8d404ff6-sql	List all genres and the number of tracks in ea	SELECT g.Name AS GenreName, COUNT(t.TrackId) A	sql
8	78bf2283-e012- 50e9-a724- 32b0fb2b790d- sql	Find all tracks with a name containing "What"	SELECT TrackId, Name FROM tracks WHERE LOWER(N	sql
9	7bcc7062-b9ff- 57eb-b9ce- 0495e481eb65- sql	Get the average invoice total for each customer:	SELECT c.CustomerId, c.FirstName,	sql
10	9d6f7703-8508- 56f1-8297- 0143426d8cfb- sql	List all albums and their corresponding artist	SELECT a.Title AS AlbumTitle, ar.Name AS Artis	sql
11	a0006c30-889f- 5782-8f59- 726368872290- sql	How many customers are there	SELECT COUNT(*) FROM customers	sql
12	b7673a50-7312- 5530-9290- b6199019c110- sql	\n Find the top 5 customers who b	SELECT c.CustomerId, c.FirstName, c.LastName,	sql

	id	question	content	training_data_type
13	c113adaa-9f4b- 5db7-8325- 8d36336235ed- sql	List all invoices with a total exceeding \$10	SELECT InvoiceId, Total FROM invoices WHERE To	sql
14	c177681b-286a- 5322-b85b- 755cbc7ee311- sql	Get the total number of invoices for each cust	SELECT c.CustomerId, c.FirstName, c.LastName,	sql
15	c849263c-3472- 5297-87f6- 2068bf9e9b3d- sql	Can you list all tables in the SQLite database	SELECT name FROM sqlite_master WHERE type = 't	sql
16	caecb17c-1d86- 5b59-a340- 4d5da01d1173- sql	Find the total number of invoices per country	SELECT c.Country, COUNT(i.InvoiceId) AS Totall	sql
17	cd236df8-7822- 5043-8b1f- e0d4637f2626- sql	Find the customer who bought the most albums i	SELECT c.CustomerId, c.FirstName, c.LastName,	sql
18	d3b34768-d9e5- 5ded-ac54- b5e0ba51d287- sql	Find the customer with the most invoices	SELECT c.CustomerId, c.FirstName, c.LastName,	sql
19	d633c37d-d58a- 5cdc-8d5a- 8c2b2b817b36- sql	\n Can you find the top 10 most popula	SELECT a.Name AS ArtistName, COUNT(t.TrackId)	sql
20	ef820d84-8025- 5484-ab1a- 79889d948502- sql	\n For the question which table stores	SELECT * FROM invoices	sql
21	f9802296-569a- 5f58-83a8- b44772a2f53e- sql	Identify artists who have albums with tracks a	SELECT DISTINCT a.ArtistId, a.Name\nFROM artis	sql
0	039f9d54-59f7- 5f29-8c04- 14dbc3e95671- ddl	None	CREATE TABLE "artists"\r\n(\r\n ArtistId IN	ddl
1	0db84e3d-ef41- 563c-803e- 21c1b985dc19- ddl	None	CREATE TABLE "invoices"\r\n(\r\n InvoiceId	ddl
2	10cba811-ddba- 5042-9e90- d764dfcd1629- ddl	None	CREATE INDEX IFK_InvoiceCustomerId ON "invoice	ddl
3	2c711317-b93d- 5f60-a728- cb1c6fcbc040-ddl	None	CREATE INDEX IFK_CustomerSupportRepId ON "cust	ddl
4	37319c81-65f7- 50ee-956b-	None	CREATE TABLE sqlite_stat1(tbl,idx,stat)	ddl

	id	question	content	training_data_type
	795de244bee5- ddl			
5	40bd77cd-e1de- 5872-8693- 624117ff413c-ddl	None	CREATE INDEX IFK_InvoiceLineInvoiceId ON "invo	ddl
6	41130543-7164- 562a-90a7- 0fd0a409c154- ddl	None	CREATE TABLE "albums"\r\n(\r\n AlbumId INTE	ddl
7	458debc8-8082- 5450-a17a- 66028bd55ace- ddl	None	CREATE TABLE "playlists"\r\n(\r\n PlaylistI	ddl
8	4815f3fd-925b- 53ce-9dfa- 0e4285d5abd3- ddl	None	CREATE TABLE "invoice_items"\r\n(\r\n Invoi	ddl
9	48d484e9-984c- 58ff-b391- 75521c69d486- ddl	None	CREATE INDEX IFK_PlaylistTrackTrackId ON "play	ddl
10	551e1120-a6ee- 554f-8b8a- ccf4f22d3636-ddl	None	CREATE INDEX IFK_AlbumArtistId ON "albums" (Ar	ddl
11	5ff4911e-45c1- 5a59-9566- 243a9b6a3320- ddl	None	CREATE TABLE "employees"\r\n(\r\n EmployeeI	ddl
12	65df0648-bf05- 5f75-9365- c21f54b2302d- ddl	None	CREATE TABLE "media_types"\r\n(\r\n MediaTy	ddl
13	6b585176-e66d- 5b23-8d86- ca8a80e3af3d- ddl	None	CREATE INDEX IFK_EmployeeReportsTo ON "employe	ddl
14	868758b8-e018- 55e7-8cc3- 75c0e6d211c8- ddl	None	CREATE INDEX IFK_TrackAlbumId ON "tracks" (Alb	ddl
15	9ea4613d-c1be- 5a77-ada9- c54ee3f0cab7- ddl	None	CREATE INDEX IFK_TrackMediaTypeId ON "tracks"	ddl
16	a9c9a852-608d- 5ef2-aede- 26ba098d83d1- ddl	None	CREATE INDEX IFK_TrackGenreId ON "tracks" (Gen	ddl
17	b42cc9e1-9219- 5a42-9a06- de906f76239e- ddl	None	CREATE TABLE "tracks"\r\n(\r\n TrackId INTE	ddl

	id	question	content	training_data_type
18	c387b9d2-5ff4- 5a07-8364- f5dab45bb2a9- ddl	None	CREATE TABLE "genres"\r\n(\r\n GenreId INTE	ddl
19	d654f328-dc36- 549e-84c3- 06ee0db7e0f7- ddl	None	CREATE TABLE "playlist_track"\r\n(\r\n Play	ddl
20	d93f0d68-023d- 5afb-8121- ba346699d318- ddl	None	CREATE TABLE "customers"\r\n(\r\n Customerl	ddl
21	e5879308-329e- 543f-a693- 0c14e2f9972e- ddl	None	CREATE INDEX IFK_InvoiceLineTrackId ON "invoic	ddl
22	ea84418b-1a28- 59b4-a1f4- 2fb674208adc- ddl	None	CREATE TABLE sqlite_sequence(name,seq)	ddl
0	2b4dda0a-a6ac- 5e34-8f76- e41c0734d55e- doc	None	In the chinook database invoice means order	documentation
1	ece10d36-9223- 5045-9ac8- 4b5bc090acb5- doc	None	\n In the 'customers' table, address column	documentation

In [19]: df\_training\_data.to\_csv(file\_csv, index=False)

 $! cat\ training\_data-deep seek-coder-v2-38054 s-duck lover 1-20241012-115724.csv$ 

In [ ]: