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?

- OpenAI via Vanna.AI (Recommended)
  Use Vanna.AI for free to generate your queries
- OpenAI
  Use OpenAI with your own API key
- Azure OpenAI
  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.AIs 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.
- Marqo
  Use Marqo 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 = 'deepseek-coder-v2'
CONFIG = {
    'model': model_name,   # 'mistral' # "starcoder2"
}

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 (fo
```

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
    else:
        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 D
```

```
    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"\[([^\]]+)]"  # 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_R
    # 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

    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 exceptior
        Please fix the error and re-generate the SQL
        """

        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)

In [11]:
```
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 termir
    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
Id)
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
Id)
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
```

Out[12]:

	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 AI

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,
    """,
    """
         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 genr
]
```

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    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 AUTOINCREMEN
T NOT NULL,\r\n    Name NVARCHAR(120)\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
OT NULL,\r\n    FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t
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
(\r\n    MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name
NVARCHAR(120)\r\n)\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
OT 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 "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
N,\r\n    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\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). \n5. 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=deepseek-coder-v2:latest,
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 sqlite_stat1(tbl,idx,stat)\n\nCREATE TABLE s
qlite_sequence(name,seq)\n\nCREATE TABLE \"playlists\"\r\n(\r\n    PlaylistI
d 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 AUTOINCR
EMENT NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE TABLE \"tracks\"\r
\n(\r\n    TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name 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    Mill
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
ACTION,\r\n    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\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 \"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    UnitPrice NUMERIC(10,2)  NOT NULL,\r\n
Quantity INTEGER  NOT NULL,\r\n    FOREIGN KEY (InvoiceId) REFERENCES \"invo
ices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n    F
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    CONST
RAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, TrackId),\r\n    FOREIGN KE
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\tON 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
L,\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\tO
N DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n\n===Additional Context \n\n
\n    In the 'customers' table, address column names do not have 'Billing' p
refix, \n    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 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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:11:18.599
221712Z', 'message': {'role': 'assistant', 'content': " ```sql\nSELECT name
FROM sqlite_master WHERE type='table';\n```"}, 'done_reason': 'stop', 'don
e': True, 'total_duration': 23006614218, 'load_duration': 904356026, 'prompt
_eval_count': 980, 'prompt_eval_duration': 20769258000, 'eval_count': 17, 'e
val_duration': 1271331000}

[( LLM Response )]
 ```sql
SELECT name FROM sqlite_master WHERE type='table';
```

[(Output from LLM)]
  ```sql
SELECT name FROM sqlite_master WHERE type='table';
```
[(Extracted SQL)]
 SELECT name FROM sqlite_master WHERE type='table'
```

SELECT name **FROM** sqlite_master **WHERE type**='table'

	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

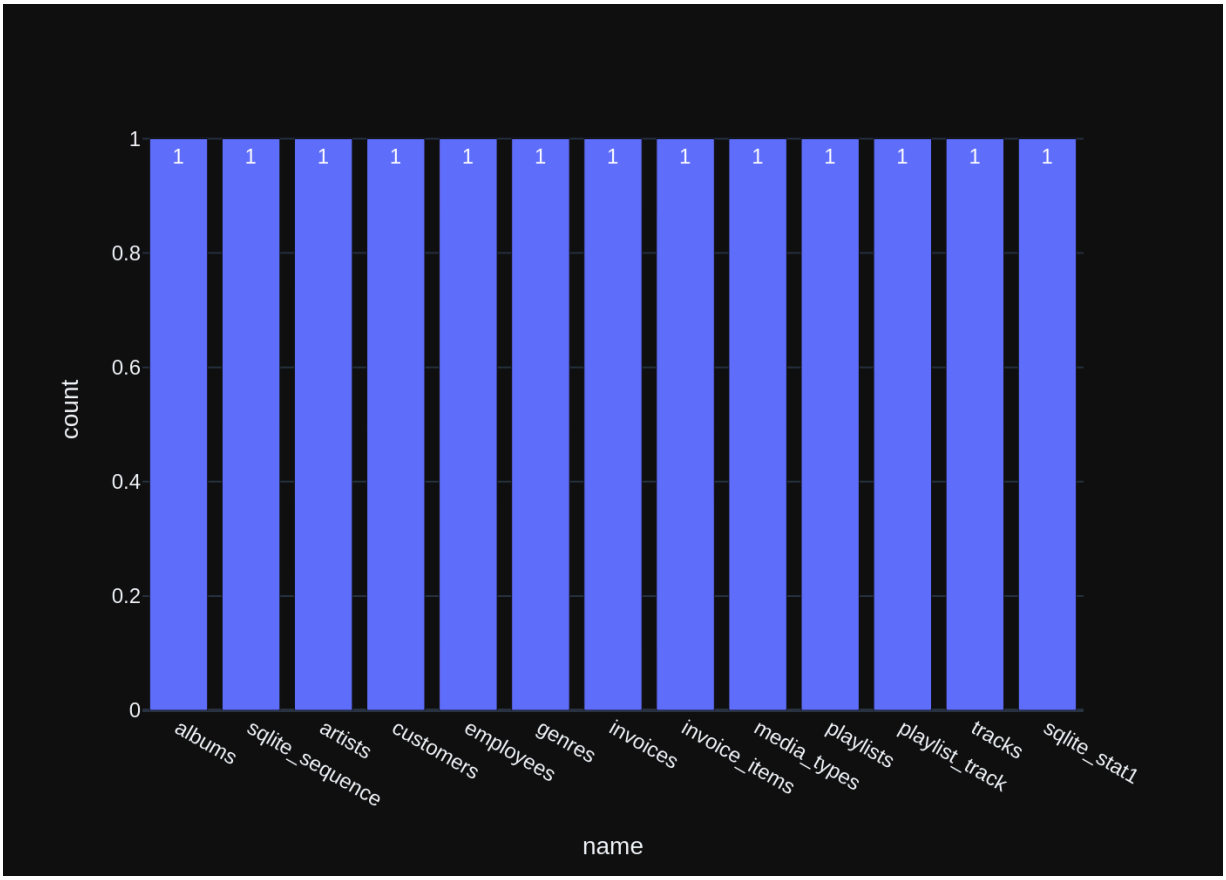
```
[Ollama parameters]
model=deepseek-coder-v2:latest,
options={},
keep_alive=None

[( 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: '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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:11:30.800
030527Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\n# Assuming df is your DataF
rame\nif len(df) == 1:\n    fig = go.Figure(go.Indicator(\n        mode="num
ber",\n        value=1,\n        title={"text": "Number of Tables"},\n
domain={\'x\': [0, 1], \'y\': [0, 1]}\n    ))\nelse:\n    fig = px.bar(df, x
=\'name\', y=None, text_auto=\'.s\')\n\nfig.show()\n```'}, 'done_reason': 's
top', 'done': True, 'total_duration': 12152729939, 'load_duration': 1075214
1, 'prompt_eval_count': 154, 'prompt_eval_duration': 3059060000, 'eval_coun
t': 131, 'eval_duration': 9039327000}
```

```python
import plotly.graph_objects as go
import pandas as pd

# Assuming df is your DataFrame
if len(df) == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=1,
        title={"text": "Number of Tables"},
        domain={'x': [0, 1], 'y': [0, 1]}
    ))
else:
    fig = px.bar(df, x='name', y=None, text_auto='.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    B
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 "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    Address
NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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    Sup
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    Bi
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
\n    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 sqlite_sequence(name,seq)\n\nCREATE TABLE "playlists"\r
\n(\r\n    PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Nam
e NVARCHAR(120)\r\n)\n\nCREATE TABLE sqlite_stat1(tbl,idx,stat)\n\nCREATE TA
BLE "albums"\r\n(\r\n    AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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\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    TrackId INTEGER  NOT NULL,\r
\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, TrackId),\r\n
FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON 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\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    e.g. count
```

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 wh
y it can\'t be generated. \n4. Please use the most relevant table(s). \n5. I
f 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', 'con
tent': "SELECT name FROM sqlite_master WHERE type='table'"}, {'role': 'use
r', 'content': "which table stores customer's orders"}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B
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 \"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
\n   LastName NVARCHAR(20) NOT NULL,\r\n   Company NVARCHAR(80),\r\n   A
ddress NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State 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 \"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
\n   BirthDate DATETIME,\r\n   HireDate DATETIME,\r\n   Address NVARCHAR
(70),\r\n   City 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 sqlite_sequence(name,seq)\n\nCREATE TABLE \"p
laylists\"\r\n(\r\n   PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\r\n   Name NVARCHAR(120)\r\n)\n\nCREATE TABLE sqlite_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
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
Id),\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\n===A
dditional Context \n\nIn the chinook database invoice means order\n\n\n   I
n 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 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'"}, {"rol
e": "user", "content": "which table stores customer's orders"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:12:13.303
33531Z', 'message': {'role': 'assistant', 'content': " intermediate_sql\n\nS
ELECT DISTINCT TableName\nFROM (\n   SELECT 'invoices' AS TableName UNION A
LL\n   SELECT 'invoice_items' AS TableName UNION ALL\n   SELECT 'customer
s' AS TableName UNION ALL\n   SELECT 'employees' AS TableName UNION ALL\n
SELECT 'playlists' AS TableName UNION ALL\n   SELECT 'albums' AS TableName
UNION ALL\n   SELECT 'playlist_track' AS TableName UNION ALL\n   SELECT 'm
edia_types' AS TableName\n)"}, 'done_reason': 'stop', 'done': True, 'total_d
uration': 42058682679, 'load_duration': 6947936, 'prompt_eval_count': 1240,
'prompt_eval_duration': 32719616000, 'eval_count': 111, 'eval_duration': 908
3253000}

[(LLM Response)]
 intermediate_sql

```
SELECT DISTINCT TableName
FROM (
    SELECT 'invoices' AS TableName UNION ALL
    SELECT 'invoice_items' AS TableName UNION ALL
    SELECT 'customers' AS TableName UNION ALL
    SELECT 'employees' AS TableName UNION ALL
    SELECT 'playlists' AS TableName UNION ALL
    SELECT 'albums' AS TableName UNION ALL
    SELECT 'playlist_track' AS TableName UNION ALL
    SELECT 'media_types' AS TableName
)
```

[(Running Intermediate SQL)]
 intermediate_sql

```
SELECT DISTINCT TableName
FROM (
    SELECT 'invoices' AS TableName UNION ALL
    SELECT 'invoice_items' AS TableName UNION ALL
    SELECT 'customers' AS TableName UNION ALL
    SELECT 'employees' AS TableName UNION ALL
    SELECT 'playlists' AS TableName UNION ALL
    SELECT 'albums' AS TableName UNION ALL
    SELECT 'playlist_track' AS TableName UNION ALL
    SELECT 'media_types' AS TableName
)
```

```
[( Final 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    B
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 "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    Address
NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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    Sup
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    Bi
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
\n    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 sqlite_sequence(name,seq)\n\nCREATE TABLE "playlists"\r
\n(\r\n    PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Nam
e NVARCHAR(120)\r\n)\n\nCREATE TABLE sqlite_stat1(tbl,idx,stat)\n\nCREATE TA
BLE "albums"\r\n(\r\n    AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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\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    TrackId INTEGER  NOT NULL,\r
\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, TrackId),\r\n
FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON 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\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   e.g. count
ry column name is \'country\', not \'BillingCountry\'\n   \n\nThe following
is a pandas DataFrame with the results of the intermediate SQL query interm
ediate_sql\n\nSELECT DISTINCT TableName\nFROM (\n   SELECT \'invoices\' AS
TableName UNION ALL\n   SELECT \'invoice_items\' AS TableName UNION ALL\n
SELECT \'customers\' AS TableName UNION ALL\n   SELECT \'employees\' AS Tab
leName UNION ALL\n   SELECT \'playlists\' AS TableName UNION ALL\n   SELEC
T \'albums\' AS TableName UNION ALL\n   SELECT \'playlist_track\' AS TableN
ame UNION ALL\n   SELECT \'media_types\' AS TableName\n): \n| | TableNam
e |\n|---:|:---------------|\n| 0 | invoices |\n| 1 | invoice_i
tems |\n| 2 | customers |\n| 3 | employees |\n| 4 | playlists
|\n| 5 | albums |\n| 6 | playlist_track |\n| 7 | media_types |
\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
table(s). \n5. If the question has been asked and answered before, please re
peat the answer exactly as it was given before. \n'}, {'role': 'user', 'cont
ent': 'Can you list all tables in the SQLite database catalog?'}, {'role':
'assistant', 'content': "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {'role': 'user', 'content': "which table stores customer's orders"}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B
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 \"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
\n   LastName NVARCHAR(20) NOT NULL,\r\n   Company NVARCHAR(80),\r\n   A
ddress NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State 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 \"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
\n   BirthDate DATETIME,\r\n   HireDate DATETIME,\r\n   Address NVARCHAR
(70),\r\n   City 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 sqlite_sequence(name,seq)\n\nCREATE TABLE \"p
laylists\"\r\n(\r\n   PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\r\n   Name NVARCHAR(120)\r\n)\n\nCREATE TABLE sqlite_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
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
Id),\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\n===A
dditional Context \n\nIn the chinook database invoice means order\n\n\n   I
n the 'customers' table, address column names do not have 'Billing' prefix,
\n   e.g. country column name is 'country', not 'BillingCountry'\n   \n\nT
he following is a pandas DataFrame with the results of the intermediate SQL
query intermediate_sql\n\nSELECT DISTINCT TableName\nFROM (\n   SELECT 'in
voices' AS TableName UNION ALL\n   SELECT 'invoice_items' AS TableName UNIO
N ALL\n   SELECT 'customers' AS TableName UNION ALL\n   SELECT 'employees'
AS TableName UNION ALL\n   SELECT 'playlists' AS TableName UNION ALL\n   S
ELECT 'albums' AS TableName UNION ALL\n   SELECT 'playlist_track' AS TableN
ame UNION ALL\n   SELECT 'media_types' AS TableName\n): \n| | TableName
|\n|---:|:---------------|\n| 0 | invoices |\n| 1 | invoice_items |
\n| 2 | customers |\n| 3 | employees |\n| 4 | playlists |
\n| 5 | albums |\n| 6 | playlist_track |\n| 7 | media_types |
\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": "Can you list all tables in the SQLite database catalog?"}, {"role": "a
ssistant", "content": "SELECT name FROM sqlite_master WHERE type='table'"},
{"role": "user", "content": "which table stores customer's orders"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:12:32.051
952737Z', 'message': {'role': 'assistant', 'content': ' The `invoices` table
stores customer orders. Here is the SQL query to select distinct order infor

```
mation from the `invoices` table:\n\n```sql\nSELECT DISTINCT InvoiceId, Cust
omerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCount
ry, BillingPostalCode, Total\nFROM invoices;\n```'}, 'done_reason': 'stop',
'done': True, 'total_duration': 18745049671, 'load_duration': 11626892, 'pro
mpt_eval_count': 1453, 'prompt_eval_duration': 12767315000, 'eval_count': 6
9, 'eval_duration': 5744200000}

[( LLM Response )]
 The `invoices` table stores customer orders. Here is the SQL query to selec
t distinct order information from the `invoices` table:

```sql
SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingC
ity, BillingState, BillingCountry, BillingPostalCode, Total
FROM invoices;
```


[(Output from LLM)]
  The `invoices` table stores customer orders. Here is the SQL query to sele
ct distinct order information from the `invoices` table:

```sql
SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingC
ity, BillingState, BillingCountry, BillingPostalCode, Total
FROM invoices;
```
[(Extracted SQL)]
 SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, Billing
City, BillingState, BillingCountry, BillingPostalCode, Total
FROM invoices
```

SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingStat

e, BillingCountry, BillingPostalCode, Total

FROM invoices

	InvoiceId	CustomerId	InvoiceDate	BillingAddress	BillingCity	BillingState	BillingCou
0	1	2	2009-01-01 00:00:00	Theodor-Heuss-Straße 34	Stuttgart	None	Ger
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	Por
410	411	44	2013-12-14 00:00:00	Porthaninkatu 9	Helsinki	None	Fi
411	412	58	2013-12-22 00:00:00	12,Community Centre	Delhi	None	

412 rows × 9 columns

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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: 'wh
ich table stores customer's orders'\n\nThe DataFrame was produced using this
query: SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, B
illingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM inv
oices\n\nThe following is information about the resulting pandas DataFrame
'df': \nRunning df.dtypes gives:\n InvoiceId              int64\nCustomerId
int64\nInvoiceDate           object\nBillingAddress        object\nBillingCi
ty           object\nBillingState          object\nBillingCountry        obj
ect\nBillingPostalCode     object\nTotal                float64\ndtype: obje
ct"}, {"role": "user", "content": "Can you generate the Python plotly code t
o chart the results of the dataframe? Assume the data is in a pandas datafra
me called 'df'. If there is only one value in the dataframe, use an Indicato
r. Respond with only Python code. Do not answer with any explanations -- jus
t the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:12:52.926
328793Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\nif df.shape[0] == 1:\n    f
ig = go.Figure(go.Indicator(\n        mode="number",\n        value=df[\'Tot
al\'].values[0],\n        title={"text": "Total"},\n        domain={\'x\':
[0, 1], \'y\': [0, 1]}\n    ))\nelse:\n    fig = go.Figure(data=[go.Table(he
ader=dict(values=[\'InvoiceId\', \'CustomerId\', \'InvoiceDate\', \'BillingA
ddress\', \'BillingCity\', \'BillingState\', \'BillingCountry\', \'BillingPo
stalCode\', \'Total\']),\n                                    cells=dict(valu
es=[df[\'InvoiceId\'], df[\'CustomerId\'], df[\'InvoiceDate\'], df[\'Billing
Address\'], df[\'BillingCity\'], df[\'BillingState\'], df[\'BillingCountry
\'], df[\'BillingPostalCode\'], df[\'Total\']]))])\n\nfig.show()\n```'}, 'do
ne_reason': 'stop', 'done': True, 'total_duration': 20837778058, 'load_durat
ion': 9422963, 'prompt_eval_count': 225, 'prompt_eval_duration': 4684416000,
'eval_count': 227, 'eval_duration': 16098827000}
```

```
import plotly.graph_objects as go
import pandas as pd

if df.shape[0] == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=df['Total'].values[0],
        title={"text": "Total"},
        domain={'x': [0, 1], 'y': [0, 1]}
    ))
else:
    fig = go.Figure(data=[go.Table(header=dict(values=['InvoiceId', 'CustomerId', 'InvoiceDate', 'BillingAddress', 'BillingCity', 'BillingState', 'BillingCountry', 'BillingPostalCode', 'Total']),
                     cells=dict(values=[df['InvoiceId'], df['CustomerId'], df['InvoiceDate'], df['BillingAddress'], df['BillingCity'], df['BillingState'], df['BillingCountry'], df['BillingPostalCode'], df['Total']]))])
```

InvoiceId	CustomerId	InvoiceDate	illingAddres	BillingCity	BillingState	illingCountr	ingPostalC	Total
1	2	2009-01-01 00:00:00	lor-Heuss-S	Stuttgart	null	Germany	70174	1.98
2	4	2009-01-02 00:00:00	Illevålsveie 4	Oslo	null	Norway	0171	3.96
3	8	2009-01-03 00:00:00	Grétrystraat 63	Brussels	null	Belgium	1000	5.94
4	14	2009-01-06 00:00:00	8210 111 ST NW	Edmonton	AB	Canada	T6G 2C7	8.91
5	23	2009-01-11 00:00:00	69 Salem Street	Boston	MA	USA	2113	13.86
6	37	2009-01-19	Berger Straße	Frankfurt	null	Germany	60316	0.99

```
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
```

```
================================================================================
====
# QUESTION - 4:  How many customers are there
================================================================================
====


[( 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    B
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_CustomerSupportRepId ON "customers" (SupportRepId)\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    Cit
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
4),\r\n    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    Inv
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
0,2)  NOT NULL,\r\n    Quantity INTEGER  NOT NULL,\r\n    FOREIGN KEY (Invoi
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
\n    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    F
irstName NVARCHAR(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\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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\tON DELETE NO ACTION
ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlists"\r\n(\r\n    PlaylistId
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': "which table stores customer's orders"}, {'role': 'assist
ant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, Billin
gAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Tota
l\nFROM invoices'}, {'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': 'How
many customers are there'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B
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_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
\n   PostalCode NVARCHAR(10),\r\n   Phone NVARCHAR(24),\r\n   Fax NVARCHA
R(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId INTEGER,\r\n
FOREIGN 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
(10,2) NOT NULL,\r\n   Quantity INTEGER NOT NULL,\r\n   FOREIGN KEY (Inv
oiceId) REFERENCES \"invoices\" (InvoiceId) \r\n\t\tON DELETE NO ACTION ON U
PDATE NO ACTION,\r\n   FOREIGN KEY (TrackId) REFERENCES \"tracks\" (TrackI
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
ms\"\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   FOR
EIGN KEY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON 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   EmployeeI
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
ETIME,\r\n   Address NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State N
VARCHAR(40),\r\n   Country NVARCHAR(40),\r\n   PostalCode NVARCHAR(10),\r

\n   Phone NVARCHAR(24),\r\n   Fax NVARCHAR(24),\r\n   Email NVARCHAR(6
0),\r\n   FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (EmployeeId) \r
\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\n===Additional Context \n\n\n   In the 'custome
rs' table, address column names do not have 'Billing' prefix, \n   e.g. 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": "which table stores customer's orders"},
{"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, Inv
oiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, Billing
PostalCode, Total\nFROM invoices"}, {"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": "user",
"content": "How many customers are there"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:13:25.406
663113Z', 'message': {'role': 'assistant', 'content': ' SELECT COUNT(*) AS N
umberOfCustomers FROM customers;'}, 'done_reason': 'stop', 'done': True, 'to
tal_duration': 32170168392, 'load_duration': 7157474, 'prompt_eval_count': 1
184, 'prompt_eval_duration': 31020502000, 'eval_count': 11, 'eval_duration':
830845000}

[(LLM Response)]
 SELECT COUNT(*) AS NumberOfCustomers FROM customers;

[(Output from LLM)]
  SELECT COUNT(*) AS NumberOfCustomers FROM customers;
[(Extracted SQL)]
 SELECT COUNT(*) AS NumberOfCustomers FROM customers

SELECT COUNT(*) AS NumberOfCustomers **FROM** customers

	NumberOfCustomers
0	59

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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(*) AS NumberOfCustomers FROM customers\n\nThe following is info
rmation about the resulting pandas DataFrame 'df': \nRunning df.dtypes give
s:\n NumberOfCustomers    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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:13:37.347
177044Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\n# Assuming df is your DataF
rame\nif len(df) == 1:\n    fig = go.Figure(go.Indicator(\n        mode="num
ber",\n        value=df[\'NumberOfCustomers\'].iloc[0],\n        title={"tex
t": "Number of Customers"}\n    ))\nelse:\n    fig = go.Figure(go.Bar(\n
x=[\'NumberOfCustomers\'],\n        y=[df[\'NumberOfCustomers\'].iloc[0]]\n
))\n\nfig.show()\n```'}, 'done_reason': 'stop', 'done': True, 'total_duratio
n': 11910928156, 'load_duration': 49211058, 'prompt_eval_count': 151, 'promp
t_eval_duration': 2923017000, 'eval_count': 129, 'eval_duration': 884949900
0}
```

```python
import plotly.graph_objects as go
import pandas as pd

# Assuming df is your DataFrame
if len(df) == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=df['NumberOfCustomers'].iloc[0],
        title={"text": "Number of Customers"}
    ))
else:
    fig = go.Figure(go.Bar(
        x=['NumberOfCustomers'],
        y=[df['NumberOfCustomers'].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
```

```
================================================================================
====
# 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    B
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
\n    PostalCode NVARCHAR(10),\r\n    Phone NVARCHAR(24),\r\n    Fax NVARCHA
R(24),\r\n    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
(\r\n    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    In
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    FOREIGN
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
"media_types"\r\n(\r\n    MediaTypeId INTEGER PRIMARY KEY AUTOINCREMENT NOT
NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK_CustomerSupportRepI
d ON "customers" (SupportRepId)\n\nCREATE TABLE "employees"\r\n(\r\n    Empl
oyeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    LastName NVARCHAR
(20)  NOT NULL,\r\n    FirstName NVARCHAR(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    Stat
e NVARCHAR(40),\r\n    Country NVARCHAR(40),\r\n    PostalCode NVARCHAR(1
0),\r\n    Phone NVARCHAR(24),\r\n    Fax NVARCHAR(24),\r\n    Email NVARCHA
R(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 "album
s"\r\n(\r\n    AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Ti
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\nCREATE TABLE "playlist_track"\r\n(\r\n    Play
listId INTEGER  NOT NULL,\r\n    TrackId INTEGER  NOT NULL,\r\n    CONSTRAIN
T PK_PlaylistTrack PRIMARY KEY  (PlaylistId, TrackId),\r\n    FOREIGN KEY (P
laylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON DELETE NO ACTION O
N UPDATE NO ACTION,\r\n    FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackI
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
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 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 \n\n\n   In the \'customers\'
table, address column names do not have \'Billing\' prefix, \n   e.g. count
ry column name is \'country\', not \'BillingCountry\'\n   \n\nIn the chinoo
k database invoice means order\n\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 g
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(*) AS NumberOfCustomers FROM custo
mers'}, {'role': 'user', 'content': "which table stores customer's orders"},
{'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, Inv
oiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, Billing
PostalCode, Total\nFROM invoices'}, {'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': 'user',
'content': 'what are the top 5 countries that customers come from?'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B
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
\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   Fax
NVARCHAR(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId INTEG
ER,\r\n   FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId)
\r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoi
ce_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
\n   UnitPrice NUMERIC(10,2) NOT NULL,\r\n   Quantity INTEGER NOT NUL
L,\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 \"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) NO
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   Ci
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
4),\r\n   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 \"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
Id),\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 sqlite_sequence(name,seq)\n\nCREATE TABLE \"trac
ks\"\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
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
NO ACTION,\r\n   FOREIGN KEY (MediaTypeId) REFERENCES \"media_types\" (Medi
aTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\n\n===Additi
onal Context \n\n\n   In the 'customers' table, address column names do not
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(*)
AS NumberOfCustomers FROM customers"}, {"role": "user", "content": "which ta
ble stores customer's orders"}, {"role": "assistant", "content": "SELECT DIS
TINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, Billi
ngState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"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": "what are the top 5 countries th
at customers come from?"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:14:21.370
178663Z', 'message': {'role': 'assistant', 'content': ' SELECT BillingCountr

y, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5'}, 'done_reason': 'stop', 'done': True, 'total_duration': 43946157816, 'load_duration': 8026458, 'prompt_eval_count': 1483, 'prompt_eval_duration': 41102545000, 'eval_count': 28, 'eval_duration': 2323117000}

```
[( LLM Response )]
 SELECT BillingCountry, COUNT(*) AS CustomerCount
FROM customers
GROUP BY BillingCountry
ORDER BY CustomerCount DESC
LIMIT 5
```

```
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    B
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
\n    PostalCode NVARCHAR(10),\r\n    Phone NVARCHAR(24),\r\n    Fax NVARCHA
R(24),\r\n    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
HAR(20)  NOT NULL,\r\n    FirstName NVARCHAR(20)  NOT NULL,\r\n    Title NVA
RCHAR(30),\r\n    ReportsTo INTEGER,\r\n    BirthDate DATETIME,\r\n    HireD
ate DATETIME,\r\n    Address NVARCHAR(70),\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    Fax NVARCHAR(24),\r\n    Email NVARC
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
N,\r\n    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\nCREATE 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
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
TABLE "playlists"\r\n(\r\n    PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT N
OT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\n\n===Additional Context \n\n\n
In the \'customers\' table, address column names do not have \'Billing\' pre
fix, \n    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': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers FROM customers'}, {'role': 'user', 'content': "which table stores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM 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': "\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\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 BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n "}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
options={},
keep_alive=None

[(Prompt Content)]
[{"role": "system", "content": "You are a SQLite expert. Please help to generate 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 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(40),\r\n 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 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\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 Fax NVARCHAR(24),\r\n Email NVARCHAR(60) NOT NULL,\r\n SupportRepId 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 NOT 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 BirthDate 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\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 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 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 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 \"genres\"\r\n(\r\n
GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Name NVARCHAR(12
0)\r\n)\n\nCREATE TABLE sqlite_stat1(tbl,idx,stat)\n\nCREATE TABLE \"albums
\"\r\n(\r\n   AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Ti
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 ACT
ION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlists\"\r\n(\r\n   Playl
istId 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
column names do not have 'Billing' prefix, \n   e.g. country column name is
'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": "How many customers are there"}, {"role": "assistant", "content":
"SELECT COUNT(*) AS NumberOfCustomers FROM customers"}, {"role": "user", "co
ntent": "which table stores customer's orders"}, {"role": "assistant", "cont
ent": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, B
illingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM inv
oices"}, {"role": "user", "content": "Can you list all tables in the SQLite
database catalog?"}, {"role": "assistant", "content": "SELECT name FROM sqli
te_master WHERE type='table'"}, {"role": "user", "content": "\n   For t
he question what are the top 5 countries that customers come from?, \n
the generated SQL statement SELECT BillingCountry, COUNT(*) AS CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:14:59.681
249067Z', 'message': {'role': 'assistant', 'content': ' The error indicates
that the `BillingCountry` column does not exist in the `customers` table. In
stead, the country information is stored in the `country` column of the `cus
tomers` table. To correct this, you should use the `country` column instead
of `BillingCountry`. Here is the corrected SQL query:\n\n```sql\nSELECT coun
try AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY co
untry\nORDER BY CustomerCount DESC\nLIMIT 5;\n```'}, 'done_reason': 'stop',
'done': True, 'total_duration': 38268313421, 'load_duration': 9429933, 'prom
pt_eval_count': 1372, 'prompt_eval_duration': 28909515000, 'eval_count': 10
6, 'eval_duration': 8866400000}

[(LLM Response)]

```
 The error indicates that the `BillingCountry` column does not exist in the
`customers` table. Instead, the country information is stored in the `countr
y` column of the `customers` table. To correct this, you should use the `cou
ntry` column instead of `BillingCountry`. Here is the corrected SQL query:

```sql
SELECT country AS Top5Countries, COUNT(*) AS CustomerCount
FROM customers
GROUP BY country
ORDER BY CustomerCount DESC
LIMIT 5;
```

[(Output from LLM)]
  The error indicates that the `BillingCountry` column does not exist in the
`customers` table. Instead, the country information is stored in the `countr
y` column of the `customers` table. To correct this, you should use the `cou
ntry` column instead of `BillingCountry`. Here is the corrected SQL query:

```sql
SELECT country AS Top5Countries, COUNT(*) AS CustomerCount
FROM customers
GROUP BY country
ORDER BY CustomerCount DESC
LIMIT 5;
```
[(Extracted SQL)]
 SELECT country AS Top5Countries, COUNT(*) AS CustomerCount
FROM customers
GROUP BY country
ORDER BY CustomerCount DESC
LIMIT 5
```

SELECT country **AS** Top5Countries, **COUNT**(*) **AS** CustomerCount

FROM customers

GROUP BY country

ORDER BY CustomerCount **DESC**

LIMIT 5

	Top5Countries	CustomerCount
0	USA	13
1	Canada	8
2	France	5
3	Brazil	5
4	Germany	4

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
options={},
keep_alive=None

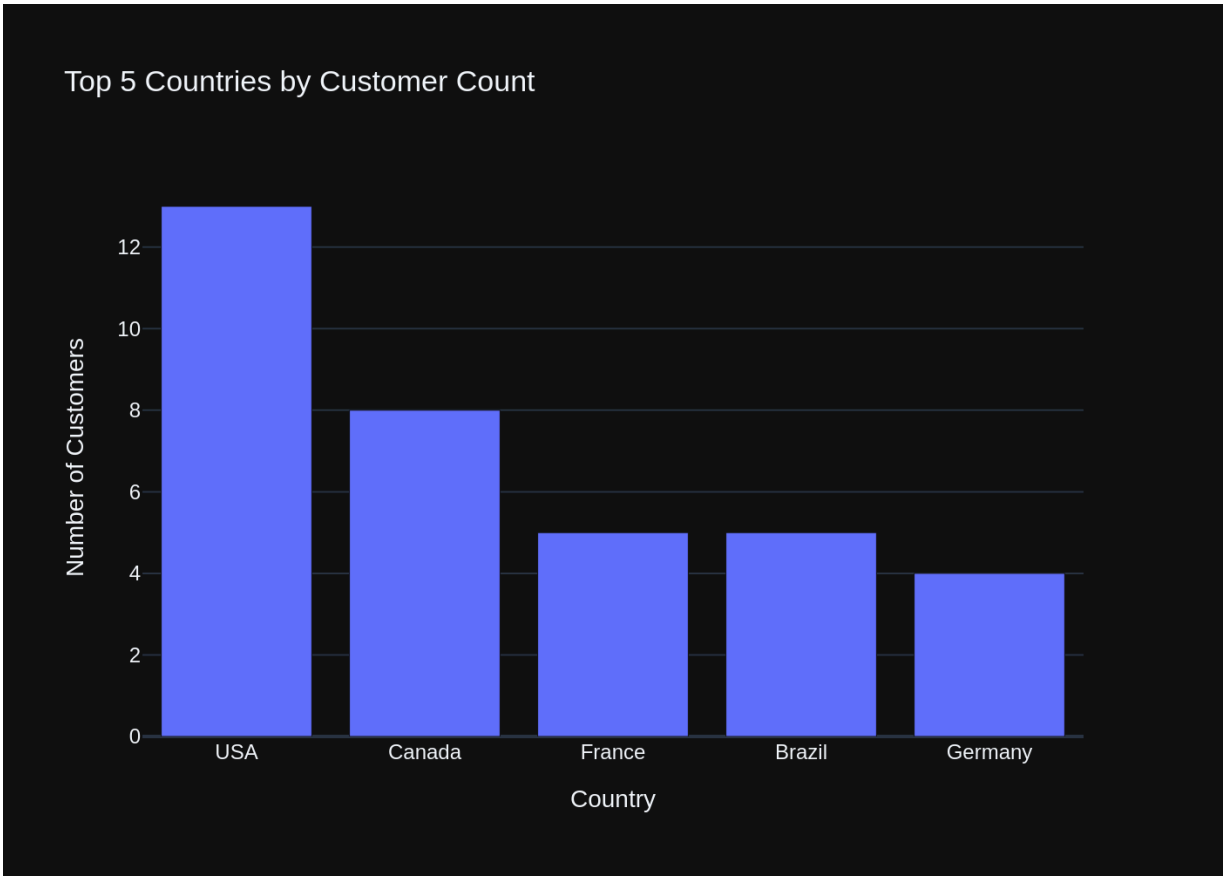
[( Prompt Content )]
[{"role": "system", "content": "The following is a pandas DataFrame that con
tains the results of the query that answers the question the user asked: '\n
For the question what are the top 5 countries that customers come from?, \n
the generated SQL statement  SELECT BillingCountry, COUNT(*) AS CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL:  S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n        Please fix the error and re-generate the SQL\n
'\n\nThe DataFrame was produced using this query: SELECT country AS Top5Coun
tries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY
CustomerCount DESC\nLIMIT 5\n\nThe following is information about the result
ing pandas DataFrame 'df': \nRunning df.dtypes gives:\n Top5Countries    obj
ect\nCustomerCount     int64\ndtype: object"}, {"role": "user", "content":
"Can you generate the Python plotly code to chart the results of the datafra
me? Assume the data is in a pandas dataframe called 'df'. If there is only o
ne value in the dataframe, use an Indicator. Respond with only Python code.
Do not answer with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:15:16.447
284945Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\n\nif len(df) == 1:\n    fig = go.Figure(data=[go.I
ndicator(value=df[\'CustomerCount\'].iloc[0], title={\'text\': "Top Country
by Customer Count"})])\nelse:\n    fig = go.Figure(data=[go.Bar(x=df[\'Top5C
ountries\'], y=df[\'CustomerCount\'])])\n\nfig.update_layout(title=\'Top 5 C
ountries by Customer Count\', xaxis_title=\'Country\', yaxis_title=\'Number
of Customers\')\nfig.show()\n```'}, 'done_reason': 'stop', 'done': True, 'to
tal_duration': 16727186365, 'load_duration': 9147445, 'prompt_eval_count': 3
23, 'prompt_eval_duration': 6762723000, 'eval_count': 137, 'eval_duration':
9829169000}
```

```python
import plotly.graph_objects as go

if len(df) == 1:
    fig = go.Figure(data=[go.Indicator(value=df['CustomerCount'].iloc[0], title={'text': "Top Cou
ntry by Customer Count"})])
else:
    fig = go.Figure(data=[go.Bar(x=df['Top5Countries'], y=df['CustomerCount'])])

fig.update_layout(title='Top 5 Countries by Customer Count', xaxis_title='Country', yaxis_titl
e='Number of Customers')
```




```
Number of requested results 10 is greater than number of elements in index
4, updating n_results = 4
Number 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
================================================================================
====


[( 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
CREATE TABLE "albums"\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    FOREIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\t
ON 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 NVARCH
AR(200)  NOT NULL,\r\n    AlbumId INTEGER,\r\n    MediaTypeId INTEGER  NOT N
ULL,\r\n    GenreId INTEGER,\r\n    Composer NVARCHAR(220),\r\n    Milliseco
nds 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) REFE
RENCES "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 INDEX IFK_TrackAl
bumId ON "tracks" (AlbumId)\n\nCREATE TABLE "artists"\r\n(\r\n    ArtistId I
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\nCREATE TABLE "genres"\r\n(\r\n    GenreId INTEGER
PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE
INDEX IFK_TrackMediaTypeId ON "tracks" (MediaTypeId)\n\n\n===Additional Cont
ext \n\n\n    In the \'customers\' table, address column names do not 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===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': 'u
ser', 'content': "which table stores customer's orders"}, {'role': 'assistan
t', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingA
ddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total
\nFROM invoices'}, {'role': 'user', 'content': 'How many customers are ther
e'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers
FROM customers'}, {'role': 'user', 'content': "\n        For the question 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 results
```

in the following exception [ERROR-DB] Failed to execute SQL: SELECT Billing
Country, 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 BillingCou
ntry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry
.\n   Please fix the error and re-generate the SQL\n   "}, {'rol
e': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT(*) AS Cu
stomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\n
LIMIT 5'}, {'role': 'user', 'content': 'List all albums and their correspond
ing artist names '}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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
ENT NOT NULL,\r\n   Title NVARCHAR(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 \"tracks
\"\r\n(\r\n   TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Na
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
NO ACTION,\r\n   FOREIGN KEY (MediaTypeId) REFERENCES \"media_types\" (Medi
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
(\r\n   ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Name NV
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
\n(\r\n   GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Name N
VARCHAR(120)\r\n)\n\nCREATE INDEX IFK_TrackMediaTypeId ON \"tracks\" (MediaT
ypeId)\n\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": "which table stores customer's o
rders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, Custom
erId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountr
y, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": "H
ow many customers are there"}, {"role": "assistant", "content": "SELECT COUN
T(*) AS NumberOfCustomers 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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL:  S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n        Please fix the error and re-generate the SQL\n
"}, {"role": "assistant", "content": "SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5"}, {"role": "user", "content": "List all albums and their c
orresponding artist names  "}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:15:46.791
011501Z', 'message': {'role': 'assistant', 'content': ' ```sql\nSELECT a.Tit
le AS AlbumTitle, ar.Name AS ArtistName\nFROM albums a\nJOIN artists ar ON
a.ArtistId = ar.ArtistId;\n```'}, 'done_reason': 'stop', 'done': True, 'tota
l_duration': 30250974122, 'load_duration': 8724166, 'prompt_eval_count': 103
8, 'prompt_eval_duration': 26547982000, 'eval_count': 39, 'eval_duration': 3
071917000}

[( LLM Response )]
 ```sql
SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName
FROM albums a
JOIN artists ar ON a.ArtistId = ar.ArtistId;
```

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

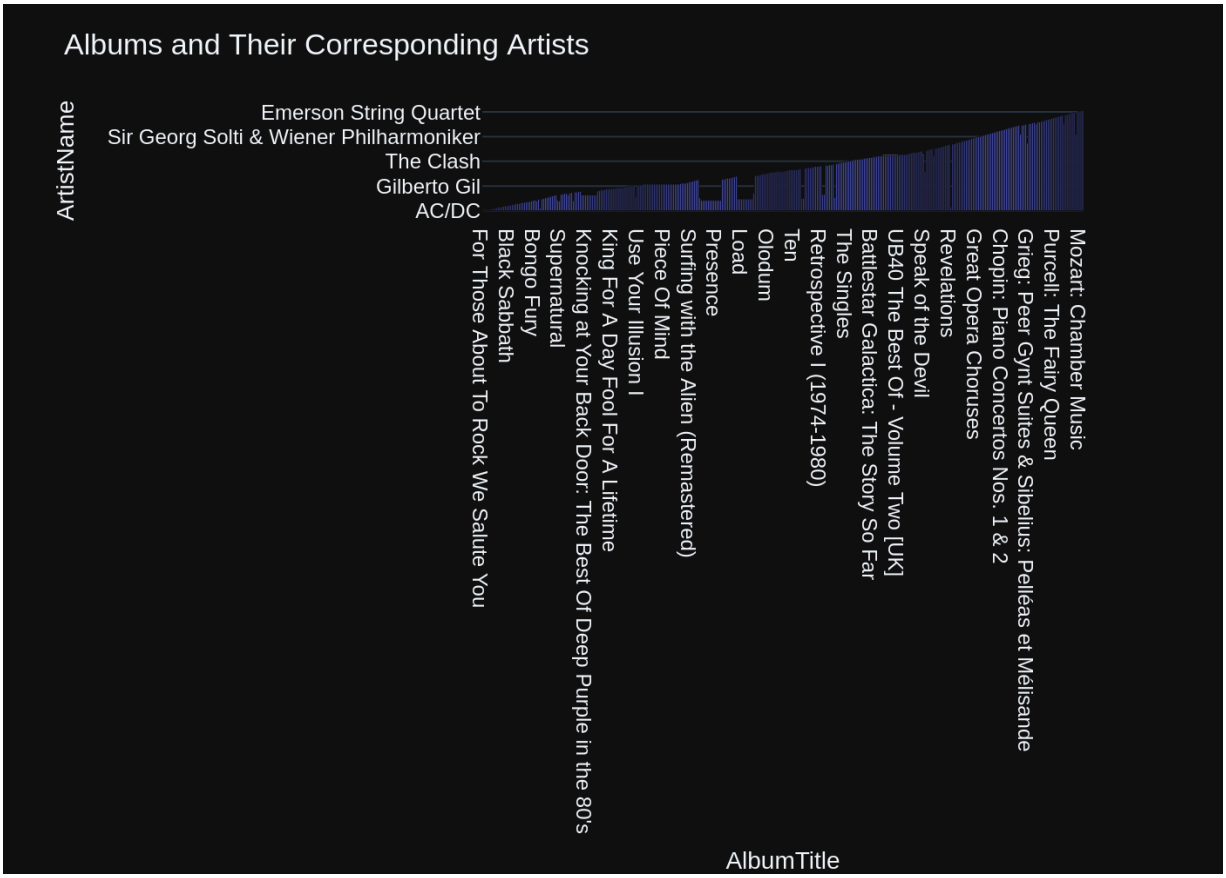
```sql
SELECT a.Title AS AlbumTitle, ar.Name AS ArtistName
FROM albums a
JOIN artists ar ON a.ArtistId = ar.ArtistId
```

	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=deepseek-coder-v2:latest,
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 query: SELECT a.Title AS AlbumTitle, ar.Name AS ArtistNam
e\nFROM albums a\nJOIN artists ar ON a.ArtistId = ar.ArtistId\n\nThe followi
ng is information about the resulting pandas DataFrame 'df': \nRunning df.dt
ypes 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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:15:57.130
460053Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\n\nif df.shape[0] == 1:\n    fig = px.indicator(value=1,
title="Album and Artist")\nelse:\n    fig = px.bar(df, x=\'AlbumTitle\', y=
\'ArtistName\', text=\'ArtistName\')\n    fig.update_layout(title=\'Albums a
nd Their Corresponding Artists\')\n\nfig.show()\n```'}, 'done_reason': 'sto
p', 'done': True, 'total_duration': 10311263822, 'load_duration': 48325045,
'prompt_eval_count': 180, 'prompt_eval_duration': 3573376000, 'eval_count':
96, 'eval_duration': 6599211000}
```

```
import plotly.express as px

if df.shape[0] == 1:
    fig = px.indicator(value=1, title="Album and Artist")
else:
    fig = px.bar(df, x='AlbumTitle', y='ArtistName', text='ArtistName')
    fig.update_layout(title='Albums and Their Corresponding Artists')
```




```
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
L,\r\n    Name NVARCHAR(200)  NOT NULL,\r\n    AlbumId INTEGER,\r\n    Media
TypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\r\n    Composer NVARCHAR(2
20),\r\n    Milliseconds INTEGER  NOT NULL,\r\n    Bytes INTEGER,\r\n    Uni
tPrice NUMERIC(10,2)  NOT NULL,\r\n    FOREIGN KEY (AlbumId) REFERENCES "alb
ums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n    FOREI
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
diaTypeId ON "tracks" (MediaTypeId)\n\nCREATE 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    FOREI
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\nCREATE TABLE "genres"\r\n(\r\n    GenreId INTEGER PRIMARY KEY
AUTOINCREMENT NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\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    e.
g. country column name is \'country\', not \'BillingCountry\'\n    \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 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 a
lbums a\nJOIN artists ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'co
ntent': 'Can you list all tables in the SQLite database catalog?'}, {'role':
'assistant', 'content': "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {'role': 'user', 'content': "which table stores customer's orders"},
{'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, Inv
oiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, Billing
PostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'How many cu
```

stomers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS Nu
mberOfCustomers 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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n Please fix the error and re-generate the SQL\n
"}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Find all tracks with a name
containing "What" (case-insensitive) '}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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
ATE TABLE \"tracks\"\r\n(\r\n TrackId INTEGER PRIMARY KEY AUTOINCREMENT N
OT 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
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\nCREATE INDEX IFK_TrackAlbumId ON \"tracks\" (AlbumId)\n\nCREATE INDEX
IFK_TrackMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCREATE TABLE \"playlist_
track\"\r\n(\r\n PlaylistId INTEGER NOT NULL,\r\n TrackId INTEGER NO
T NULL,\r\n CONSTRAINT PK_PlaylistTrack PRIMARY KEY (PlaylistId, TrackI
d),\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
E \"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 NULL,\r\n Name NVARCHAR(12
0)\r\n)\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 'B
illing' prefix, \n e.g. country column name is 'country', not 'BillingCou
ntry'\n \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.ArtistId"},
{"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": "which table stores custom
er's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId,
CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingC
ountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "conten
t": "How many customers are there"}, {"role": "assistant", "content": "SELEC
T COUNT(*) AS NumberOfCustomers FROM customers"}, {"role": "user", "conten
t": "\n   For the question what are the top 5 countries that customers
come from?, \n   the generated SQL statement SELECT BillingCountry, CO
UNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY C
ustomerCount DESC\nLIMIT 5 results in the following exception [ERROR-DB] Fai
led to execute SQL: SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM
customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n E
xecution failed on sql ' SELECT BillingCountry, COUNT(*) AS CustomerCount\nF
ROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT
5': no such column: BillingCountry .\n   Please fix the error and re-ge
nerate the SQL\n   "}, {"role": "assistant", "content": "SELECT country
AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY countr
y\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "user", "content": "Find
all tracks with a name containing \"What\" (case-insensitive) "}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:16:28.606
228718Z', 'message': {'role': 'assistant', 'content': " SELECT * FROM tracks
\nWHERE LOWER(Name) LIKE '%what%'"}, 'done_reason': 'stop', 'done': True, 't
otal_duration': 30709209349, 'load_duration': 6857164, 'prompt_eval_count':
1111, 'prompt_eval_duration': 28747640000, 'eval_count': 16, 'eval_duratio
n': 1210169000}

[(LLM Response)]

```
 SELECT * FROM tracks
WHERE LOWER(Name) LIKE '%what%'
```

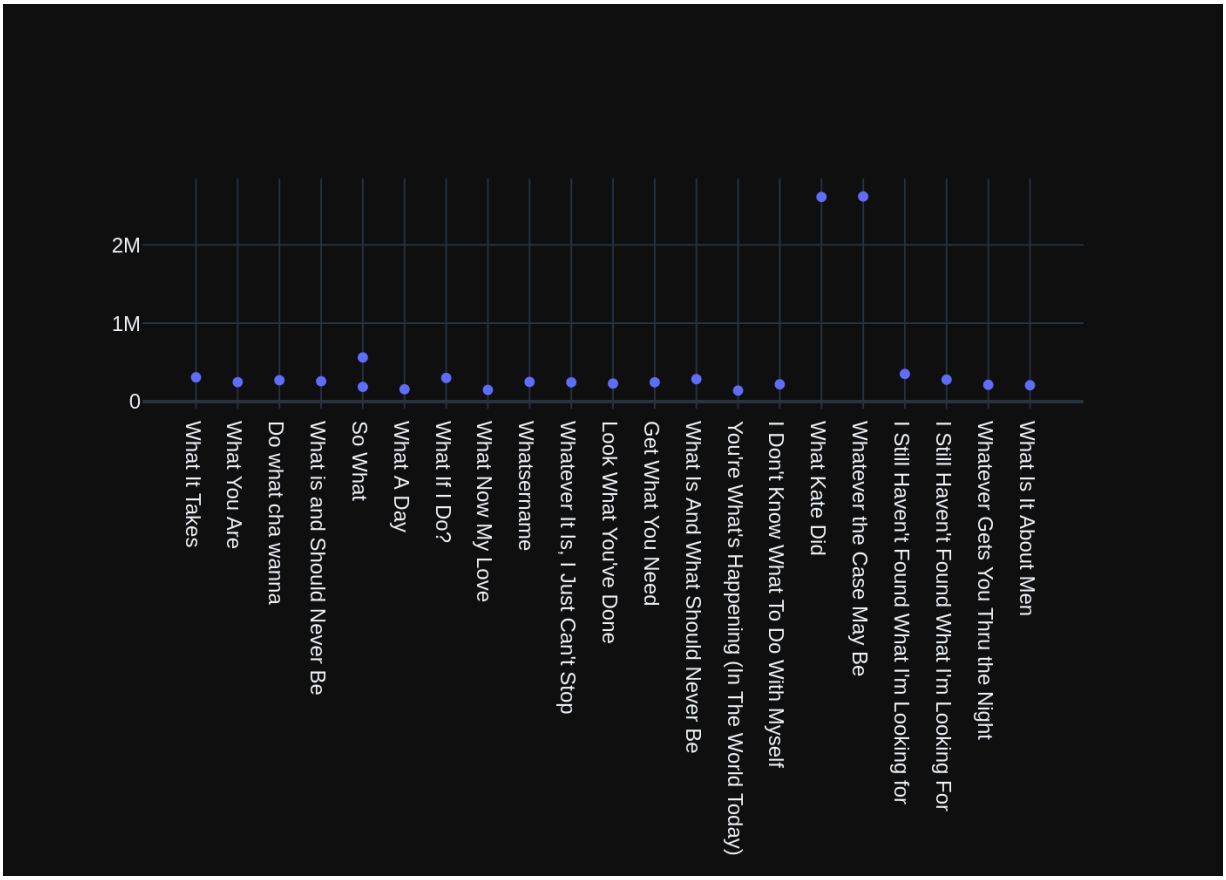
```
SELECT * FROM tracks
WHERE LOWER(Name) LIKE '%what%'
```

	TrackId	Name	AlbumId	MediaTypeId	GenreId	Composer	Milliseconds
0	26	What It Takes	5	1	1	Steven Tyler, Joe Perry, Desmond Child	310622
1	88	What You Are	10	1	1	Audioslave/Chris Cornell	249391
2	130	Do what cha wanna	13	1	2	George Duke	274155
3	342	What is and Should Never Be	30	1	1	Jimmy Page/Robert Plant	260675
4	607	So What	48	1	2	Miles Davis	564009
5	960	What A Day	76	1	1	Mike Bordin, Billy Gould, Mike Patton	158275
6	1000	What If I Do?	80	1	1	Dave Grohl, Taylor Hawkins, Nate Mendel, Chris...	302994
7	1039	What Now My Love	83	1	12	carl sigman/gilbert becaud/pierre leroyer	149995
8	1145	Whatsername	89	1	4	Green Day	252316
9	1440	Whatever It Is, I Just Can't Stop	116	1	1	Jay Kay/Kay, Jay	247222
10	1469	Look What You've Done	119	1	4	N. Cester	230974
11	1470	Get What You Need	119	1	4	C. Cester/C. Muncey/N. Cester	247719
12	1628	What Is And What Should Never Be	133	1	1	Jimmy Page, Robert Plant	287973
13	1778	You're What's Happening (In The World Today)	146	1	14	Allen Story/George Gordy/Robert Gordy	142027
14	1823	So What	149	1	3	Culmer/Exalt	189152
15	2772	I Don't Know What To Do With Myself	223	1	7	None	221387
16	2884	What Kate Did	231	3	19	None	2610250
17	2893	Whatever the Case May Be	230	3	19	None	2616410
18	2992	I Still Haven't Found What	237	1	1	Bono/Clayton, Adam/Mullen	353567

	TrackId	Name	AlbumId	MediaTypeId	GenreId	Composer	Milliseconds
		I'm Looking for				Jr., Larry/The Edge	
19	3007	I Still Haven't Found What I'm Looking For	238	1	1	U2	280764
20	3258	Whatever Gets You Thru the Night	255	2	9	None	215084
21	3475	What Is It About Men	322	2	9	Delroy "Chris" Cooper, Donovan Jackson, Earl C...	209573


```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 * FROM tracks\nWHERE LOWER(Na
me) LIKE '%what%'\n\nThe following is information about the resulting pandas
DataFrame 'df': \nRunning df.dtypes gives:\n TrackId           int64\nName
object\nAlbumId           int64\nMediaTypeId       int64\nGenreId
int64\nComposer         object\nMilliseconds      int64\nBytes             i
nt64\nUnitPrice       float64\ndtype: object"}, {"role": "user", "content":
"Can you generate the Python plotly code to chart the results of the datafra
me? Assume the data is in a pandas dataframe called 'df'. If there is only o
ne value in the dataframe, use an Indicator. Respond with only Python code.
Do not answer with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:16:42.747
618816Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\n# Check if the DataFrame ha
s more than one row\nif len(df) == 1:\n    fig = go.Figure(go.Indicator(\n
mode="number",\n        value=df[\'TrackId\'].iloc[0],\n        title={"tex
t": "Track ID"},\n        number={\'prefix\': \'\'}\n    ))\nelse:\n    fig
= go.Figure(data=[go.Scatter(x=df[\'Name\'], y=df[\'Milliseconds\'], mode=
\'markers\')])\n\nfig.show()\n```'}, 'done_reason': 'stop', 'done': True, 't
otal_duration': 14116438049, 'load_duration': 8311930, 'prompt_eval_count':
215, 'prompt_eval_duration': 4455831000, 'eval_count': 137, 'eval_duration':
9527306000}
```

```
import plotly.graph_objects as go
import pandas as pd

# Check if the DataFrame has more than one row
if len(df) == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=df['TrackId'].iloc[0],
        title={"text": "Track ID"},
        number={'prefix': ''}
    ))
else:
    fig = go.Figure(data=[go.Scatter(x=df['Name'], y=df['Milliseconds'], mode='markers')])
```




```
Number of requested results 10 is greater than number of elements in index
6, updating n_results = 6
Number 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    B
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_I
nvoiceLineInvoiceId ON "invoice_items" (InvoiceId)\n\nCREATE TABLE "invoice_
items"\r\n(\r\n    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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 "c
ustomers"\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    Cit
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
4),\r\n    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    E
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    HireDa
te DATETIME,\r\n    Address NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    S
tate NVARCHAR(40),\r\n    Country NVARCHAR(40),\r\n    PostalCode NVARCHAR(1
0),\r\n    Phone NVARCHAR(24),\r\n    Fax NVARCHAR(24),\r\n    Email NVARCHA
R(60),\r\n    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
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
OT NULL,\r\n    FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t
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\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': "which table sto
res customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT I
nvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingStat
e, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'use
r', 'content': 'How many customers are there'}, {'role': 'assistant', 'conte
nt': 'SELECT COUNT(*) AS NumberOfCustomers 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 BillingC
ountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\n
ORDER BY CustomerCount DESC\nLIMIT 5 results in the following exception [ERR
OR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(*) AS CustomerCo
unt\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nL
IMIT 5\n Execution failed on sql ' SELECT BillingCountry, COUNT(*) AS Custom
erCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DES
C\nLIMIT 5': no such column: BillingCountry .\n   Please fix the error
and re-generate the SQL\n   "}, {'role': 'assistant', 'content': 'SELEC
T country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP
BY country\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\nFR
OM 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 * FROM tracks\nWHERE LOWER(Nam
e) LIKE '%what%'"}, {'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': 'Get
the total number of invoices for each customer'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B
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
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 \"customers\"\r\n(\r\n   CustomerId INTEGER PRIMARY KEY AU
TOINCREMENT NOT NULL,\r\n   FirstName NVARCHAR(40) NOT NULL,\r\n   LastNa
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   Country
NVARCHAR(40),\r\n   PostalCode NVARCHAR(10),\r\n   Phone NVARCHAR(24),\r\n
Fax NVARCHAR(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId I
NTEGER,\r\n   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
oyees\"\r\n(\r\n   EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r
\n   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
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
4),\r\n   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   Me
diaTypeId INTEGER NOT NULL,\r\n   GenreId INTEGER,\r\n   Composer NVARCHA
R(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\n===Additional Context \n\nIn the chinook database invoice means ord
er\n\n\n   In the 'customers' table, address column names do not have 'Bill
ing' prefix, \n   e.g. country column name is 'country', not 'BillingCountr
y'\n   \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": "which table stores customer's orders"}, {"role": "assistant", "c
ontent": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddres
s, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM
invoices"}, {"role": "user", "content": "How many customers are there"}, {"r
ole": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers FROM cus
tomers"}, {"role": "user", "content": "\n   For the question what are t
he top 5 countries that customers come from?, \n   the generated SQL st
atement SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nG
ROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5 results in the
following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountr
y, 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\nOR
DER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n
Please fix the error and re-generate the SQL\n "}, {"role": "assistan
t", "content": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\n
FROM 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.Arti
stId"}, {"role": "user", "content": "Find all tracks with a name containing
\"What\" (case-insensitive) "}, {"role": "assistant", "content": " SELECT *
FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {"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'"}, {"rol
e": "user", "content": "Get the total number of invoices for each custome
r"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:17:29.204
622368Z', 'message': {'role': 'assistant', 'content': ' SELECT CustomerId, C
OUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, 'done_reaso
n': 'stop', 'done': True, 'total_duration': 46362548460, 'load_duration': 85
62980, 'prompt_eval_count': 1587, 'prompt_eval_duration': 43955261000, 'eval
_count': 19, 'eval_duration': 1507872000}

[(LLM Response)]

```
 SELECT CustomerId, COUNT(*) AS TotalInvoices
FROM invoices
GROUP BY CustomerId
```

SELECT CustomerId, **COUNT**(*) **AS** TotalInvoices

FROM invoices

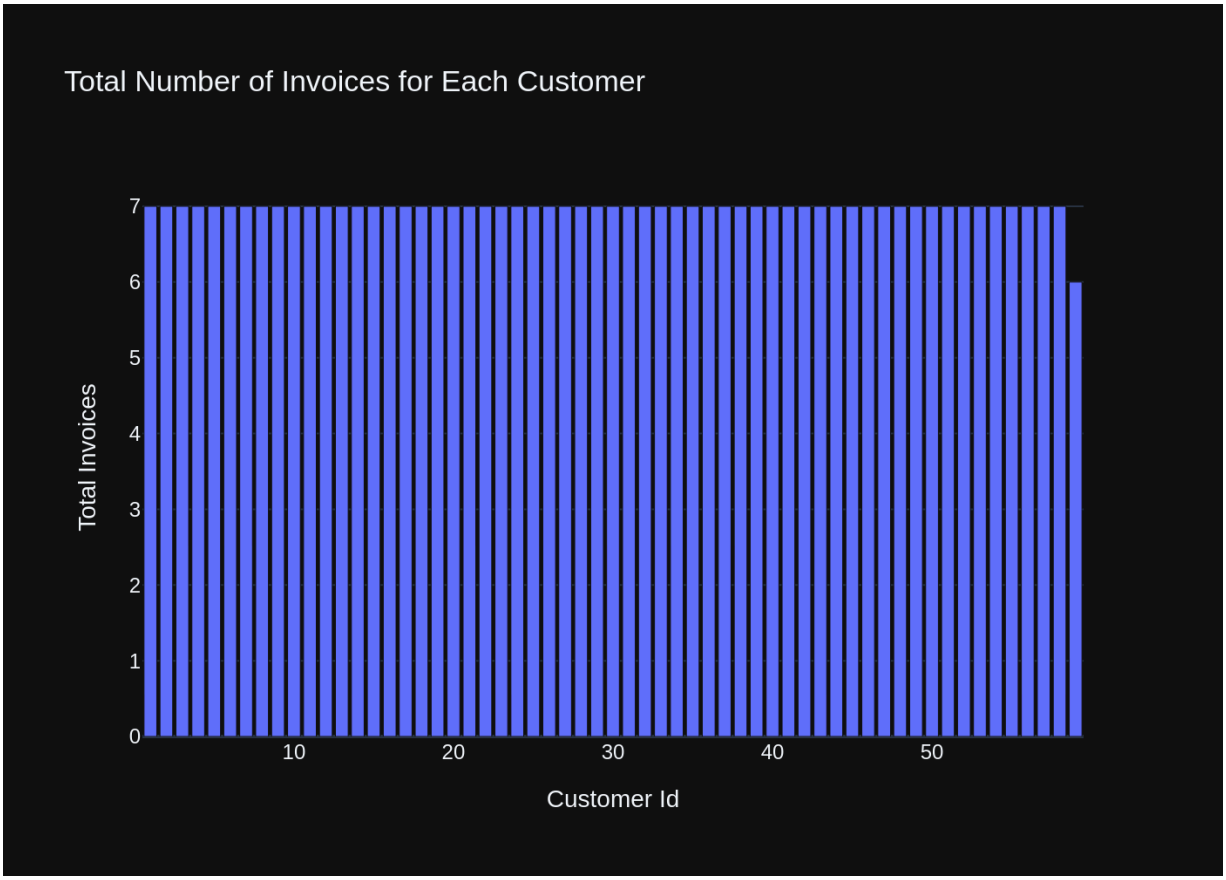
GROUP BY CustomerId

	CustomerId	TotalInvoices
0	1	7
1	2	7
2	3	7
3	4	7
4	5	7
5	6	7
6	7	7
7	8	7
8	9	7
9	10	7
10	11	7
11	12	7
12	13	7
13	14	7
14	15	7
15	16	7
16	17	7
17	18	7
18	19	7
19	20	7
20	21	7
21	22	7
22	23	7
23	24	7
24	25	7
25	26	7
26	27	7
27	28	7
28	29	7
29	30	7
30	31	7
31	32	7
32	33	7
33	34	7

	CustomerId	TotalInvoices
34	35	7
35	36	7
36	37	7
37	38	7
38	39	7
39	40	7
40	41	7
41	42	7
42	43	7
43	44	7
44	45	7
45	46	7
46	47	7
47	48	7
48	49	7
49	50	7
50	51	7
51	52	7
52	53	7
53	54	7
54	55	7
55	56	7
56	57	7
57	58	7
58	59	6

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 CustomerId, COUNT(*) AS TotalInvoices\nFROM in
voices\nGROUP BY CustomerId\n\nThe following is information about the result
ing pandas DataFrame 'df': \nRunning df.dtypes gives:\n CustomerId       int
64\nTotalInvoices    int64\ndtype: object"}, {"role": "user", "content": "Ca
n you generate 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 v
alue in the dataframe, use an Indicator. Respond with only Python code. Do n
ot answer with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:17:41.619
949423Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\nif len(df) == 1:\n    fig =
go.Figure(go.Indicator(mode="number", value=df[\'TotalInvoices\'].iloc[0]))
\nelse:\n    fig = go.Figure(data=[go.Bar(x=df[\'CustomerId\'], y=df[\'Total
Invoices\'])])\n\nfig.update_layout(title=\'Total Number of Invoices for Eac
h Customer\', xaxis_title=\'Customer Id\', yaxis_title=\'Total Invoices\')\n
fig.show()\n```'}, 'done_reason': 'stop', 'done': True, 'total_duration': 12
379857507, 'load_duration': 9011278, 'prompt_eval_count': 172, 'prompt_eval_
duration': 3279821000, 'eval_count': 134, 'eval_duration': 9005835000}
```

```python
import plotly.graph_objects as go
import pandas as pd

if len(df) == 1:
    fig = go.Figure(go.Indicator(mode="number", value=df['TotalInvoices'].iloc[0]))
else:
    fig = go.Figure(data=[go.Bar(x=df['CustomerId'], y=df['TotalInvoices'])])

fig.update_layout(title='Total Number of Invoices for Each Customer', xaxis_title='Customer Id', yaxis_title='Total Invoices')
```




```
Number of requested results 10 is greater than number of elements in index
7, updating n_results = 7
Number of requested results 10 is greater than number of elements in index
2, updating n_results = 2
```

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


[( 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    B
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 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
\n    UnitPrice NUMERIC(10,2)  NOT NULL,\r\n    Quantity INTEGER  NOT NUL
L,\r\n    FOREIGN KEY (InvoiceId) REFERENCES "invoices" (InvoiceId) \r\n\t\t
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
ABLE "employees"\r\n(\r\n    EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NO
T 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    Bi
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
\n    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    LastN
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    Countr
y NVARCHAR(40),\r\n    PostalCode NVARCHAR(10),\r\n    Phone NVARCHAR(24),\r
\n    Fax NVARCHAR(24),\r\n    Email NVARCHAR(60)  NOT NULL,\r\n    SupportR
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
\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    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
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 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 \n\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 CustomerId, COUNT (*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': "which table stores customer's orders"}, {'role': 'assistant', 'c ontent': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddres s, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'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\n GROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5 results in the following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountr y, 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\nOR DER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n   "}, {'role': 'assistan t', 'content': 'SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\n FROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5'}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assis tant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers FROM customers'}, {'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.Arti stId'}, {'role': 'user', 'content': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': " SELECT * FR OM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'C an you list all tables in the SQLite database catalog?'}, {'role': 'assistan t', 'content': "SELECT name FROM sqlite_master WHERE type='table'"}, {'rol e': 'user', 'content': 'Find the total number of invoices per country'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B 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 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   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 ACTION\r\n)\n\nCREATE INDEX IFK_InvoiceLineInvoiceId ON \"invoice_items\" (InvoiceId)\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   FirstName NVARCHAR(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\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   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 NULL,\r\n   LastName NVARCHAR(20) 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\n   PostalCode NVARCHAR(10),\r\n   Phone NVARCHAR(24),\r\n   Fax NVARCHAR(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId INTEGER,\r\n   FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) \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\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   FOREIGN KEY (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 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 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 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\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   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 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 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": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": " SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "which table stores customer's ord

ers"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, Customer
Id, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry,
BillingPostalCode, Total\nFROM 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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}, {"role": "assistant", "content": "SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5"}, {"role": "user", "content": "How many customers are ther
e"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers
FROM customers"}, {"role": "user", "content": "List all albums and their cor
responding artist names "}, {"role": "assistant", "content": "SELECT a.Titl
e 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", "con
tent": " SELECT * FROM tracks\nWHERE 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 the total number of invoic
es per country"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:18:31.368
82431Z', 'message': {'role': 'assistant', 'content': ' SELECT BillingCountr
y, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, 'don
e_reason': 'stop', 'done': True, 'total_duration': 49668379427, 'load_durati
on': 8704609, 'prompt_eval_count': 1683, 'prompt_eval_duration': 4710410600
0, 'eval_count': 19, 'eval_duration': 1544408000}

[(LLM Response)]

```
 SELECT BillingCountry, COUNT(*) AS TotalInvoices
FROM invoices
GROUP BY BillingCountry
```

SELECT BillingCountry, **COUNT**(*) **AS** TotalInvoices

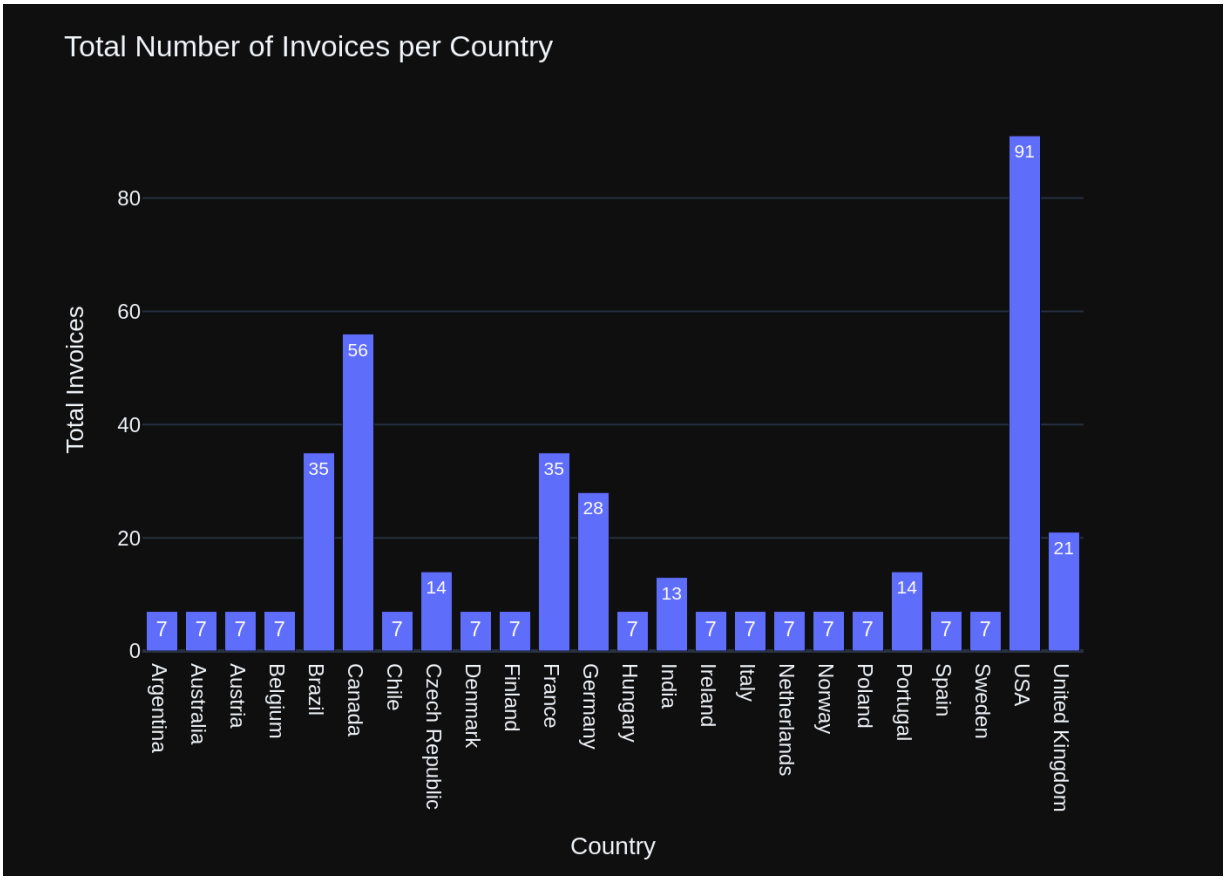
FROM invoices

GROUP BY BillingCountry

	BillingCountry	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=deepseek-coder-v2:latest,
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 query:  SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM inv
oices\nGROUP BY BillingCountry\n\nThe following is information about the res
ulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n BillingCountry
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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:18:43.087
363037Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\n\nif df[\'TotalInvoices\'].nunique() == 1:\n    fig = p
x.indicator(value=df[\'TotalInvoices\'].iloc[0], title="Total Invoices")\nel
se:\n    fig = px.bar(df, x=\'BillingCountry\', y=\'TotalInvoices\', text=
\'TotalInvoices\')\nfig.update_layout(title=\'Total Number of Invoices per C
ountry\', xaxis_title=\'Country\', yaxis_title=\'Total Invoices\')\nfig.show
()\n```'}, 'done_reason': 'stop', 'done': True, 'total_duration': 1168142405
5, 'load_duration': 7737200, 'prompt_eval_count': 169, 'prompt_eval_duratio
n': 3284618000, 'eval_count': 125, 'eval_duration': 8345774000}
```

```python
import plotly.express as px

if df['TotalInvoices'].nunique() == 1:
    fig = px.indicator(value=df['TotalInvoices'].iloc[0], title="Total Invoices")
else:
    fig = px.bar(df, x='BillingCountry', y='TotalInvoices', text='TotalInvoices')
fig.update_layout(title='Total Number of Invoices per Country', xaxis_title='Country', yaxis_ti
tle='Total Invoices')
```




```
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
```

```
================================================================================
====
# 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
L,\r\n    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
N,\r\n    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    In
voiceId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    CustomerId INTEGE
R  NOT NULL,\r\n    InvoiceDate DATETIME  NOT NULL,\r\n    BillingAddress NV
ARCHAR(70),\r\n    BillingCity NVARCHAR(40),\r\n    BillingState NVARCHAR(4
0),\r\n    BillingCountry NVARCHAR(40),\r\n    BillingPostalCode NVARCHAR(1
0),\r\n    Total NUMERIC(10,2)  NOT NULL,\r\n    FOREIGN KEY (CustomerId) RE
FERENCES "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
ULL,\r\n    Name NVARCHAR(200)  NOT NULL,\r\n    AlbumId INTEGER,\r\n    Med
iaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\r\n    Composer NVARCHAR
(220),\r\n    Milliseconds INTEGER  NOT NULL,\r\n    Bytes INTEGER,\r\n    U
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    FOR
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    Cit
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
4),\r\n    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
HAR(20)  NOT NULL,\r\n    FirstName NVARCHAR(20)  NOT NULL,\r\n    Title NVA
RCHAR(30),\r\n    ReportsTo INTEGER,\r\n    BirthDate DATETIME,\r\n    HireD
ate DATETIME,\r\n    Address NVARCHAR(70),\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    Fax NVARCHAR(24),\r\n    Email NVARC
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 INDEX IFK_Cus
tomerSupportRepId ON "customers" (SupportRepId)\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    e.g. co
```

untry column name is \'country\', not \'BillingCountry\'\n   \n\n===Respons
e Guidelines \n1. 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 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 CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY
CustomerId'}, {'role': 'user', 'content': 'Find the total number of invoices
per country'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COU
NT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role':
'user', 'content': "which table stores customer's orders"}, {'role': 'assist
ant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, Billin
gAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Tota
l\nFROM invoices'}, {'role': 'user', 'content': 'How many customers are ther
e'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers
FROM customers'}, {'role': 'user', 'content': "\n   For the question 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 results
in the following exception [ERROR-DB] Failed to execute SQL: SELECT Billing
Country, 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 BillingCou
ntry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry
.\n   Please fix the error and re-generate the SQL\n   "}, {'rol
e': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT(*) AS Cu
stomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\n
LIMIT 5'}, {'role': 'user', 'content': 'List all albums and their correspond
ing artist names '}, {'role': 'assistant', 'content': 'SELECT a.Title AS Al
bumTitle, ar.Name AS ArtistName\nFROM albums a\nJOIN artists ar ON a.ArtistI
d = ar.ArtistId'}, {'role': 'user', 'content': 'Find all tracks with a name
containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "
SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'c
ontent': 'Can you list all tables in the SQLite database catalog?'}, {'rol
e': 'assistant', 'content': "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {'role': 'user', 'content': 'List all invoices with a total exceeding
$10'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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
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
N,\r\n   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
GER NOT NULL,\r\n   InvoiceDate DATETIME NOT NULL,\r\n   BillingAddress
NVARCHAR(70),\r\n   BillingCity NVARCHAR(40),\r\n   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 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\n   MediaTypeId INTEGER NOT NULL,\r\n   GenreId INTEGER,\r\n   Comp
oser NVARCHAR(220),\r\n   Milliseconds INTEGER NOT NULL,\r\n   Bytes INTE
GER,\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
ION,\r\n   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   Last
Name NVARCHAR(20) NOT NULL,\r\n   Company NVARCHAR(80),\r\n   Address NVA
RCHAR(70),\r\n   City NVARCHAR(40),\r\n   State NVARCHAR(40),\r\n   Count
ry 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   Sup
portRepId INTEGER,\r\n   FOREIGN KEY (SupportRepId) REFERENCES \"employees
\" (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
BirthDate 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\n   PostalCode NVARCHAR(10),\r\n   Phone NVARCHAR(24),\r\n   Fax
NVARCHAR(24),\r\n   Email NVARCHAR(60),\r\n   FOREIGN KEY (ReportsTo) REFE
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\n===Additional Context \n\nIn the chinook database invoice means
order\n\n\n   In the 'customers' table, address column names do not have 'B
illing' prefix, \n   e.g. country column name is 'country', not 'BillingCou
ntry'\n   \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 CustomerId, COUNT(*) AS TotalInvoi
ces\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find
the total number of invoices per country"}, {"role": "assistant", "content":
" SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY

BillingCountry"}, {"role": "user", "content": "which table stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers 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\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 BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n   Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM 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, 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 * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {"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"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:19:31.454472941Z', 'message': {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total > 10'}, 'done_reason': 'stop', 'done': True, 'total_duration': 48249622613, 'load_duration': 7998688, 'prompt_eval_count': 1657, 'prompt_eval_duration': 46247151000, 'eval_count': 11, 'eval_duration': 853854000}

[(LLM Response)]

```
 SELECT * FROM invoices WHERE Total > 10
```

```
SELECT * FROM invoices WHERE Total > 10
```

	InvoiceId	CustomerId	InvoiceDate	BillingAddress	BillingCity	BillingState	BillingCou
0	5	23	2009-01-11 00:00:00	69 Salem Street	Boston	MA	
1	12	2	2009-02-11 00:00:00	Theodor-Heuss-Straße 34	Stuttgart	None	Gerr
2	19	40	2009-03-14 00:00:00	8, Rue Hanovre	Paris	None	Fr
3	26	19	2009-04-14 00:00:00	1 Infinite Loop	Cupertino	CA	
4	33	57	2009-05-15 00:00:00	Calle Lira, 198	Santiago	None	
...	...	...	...	...	...	...	
59	383	10	2013-08-12 00:00:00	Rua Dr. Falcão Filho, 155	São Paulo	SP	E
60	390	48	2013-09-12 00:00:00	Lijnbaansgracht 120bg	Amsterdam	VV	Netherl
61	397	27	2013-10-13 00:00:00	1033 N Park Ave	Tucson	AZ	
62	404	6	2013-11-13 00:00:00	Rilská 3174/6	Prague	None	Czech Rep
63	411	44	2013-12-14 00:00:00	Porthaninkatu 9	Helsinki	None	Fir

64 rows × 9 columns

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 * FROM invoices WHERE Total > 10\n\nThe following is
information about the resulting pandas DataFrame 'df': \nRunning df.dtypes g
ives:\n InvoiceId              int64\nCustomerId             int64\nInvoiceD
ate           object\nBillingAddress        object\nBillingCity           ob
ject\nBillingState          object\nBillingCountry        object\nBillingPos
talCode     object\nTotal                float64\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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:19:44.657
577688Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\nif df.shape[0] == 1:\n    f
ig = go.Figure(go.Indicator(\n        mode="number",\n        value=df[\'Tot
al\'].values[0],\n        title={"text": "Total Invoice Amount"}\n    ))\nel
se:\n    fig = go.Figure(data=[go.Bar(x=df[\'InvoiceDate\'], y=df[\'Total
\'])])\n\nfig.update_layout(title=\'Invoices with Total Exceeding $10\')\nfi
g.show()\n```'}, 'done_reason': 'stop', 'done': True, 'total_duration': 1316
8103078, 'load_duration': 9604344, 'prompt_eval_count': 207, 'prompt_eval_du
ration': 4034706000, 'eval_count': 134, 'eval_duration': 9038262000}
```

```python
import plotly.graph_objects as go
import pandas as pd

if df.shape[0] == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=df['Total'].values[0],
        title={"text": "Total Invoice Amount"}
    ))
else:
    fig = go.Figure(data=[go.Bar(x=df['InvoiceDate'], y=df['Total'])])

fig.update_layout(title='Invoices with Total Exceeding $10')
```


```
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
```

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


[( 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    B
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 "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 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
LE "employees"\r\n(\r\n    EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT
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    BirthD
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
\n    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    LastN
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    Countr
y NVARCHAR(40),\r\n    PostalCode NVARCHAR(10),\r\n    Phone NVARCHAR(24),\r
\n    Fax NVARCHAR(24),\r\n    Email NVARCHAR(60)  NOT NULL,\r\n    SupportR
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 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
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" (AlbumI
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
ACTION,\r\n    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    FOR
EIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACT
```

ION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "playlist_track"\r\n(\r\n   Pl
aylistId INTEGER NOT NULL,\r\n   TrackId 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 ACTION
ON UPDATE NO ACTION,\r\n   FOREIGN KEY (TrackId) REFERENCES "tracks" (Track
Id) \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\n\n   In the \'cu
stomers\' 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 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 * FROM invoices WHERE Total > 10'}, {'role': 'user', 'conten
t': 'Find the total number of invoices per country'}, {'role': 'assistant',
'content': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices
\nGROUP BY BillingCountry'}, {'role': 'user', 'content': 'Get the total numb
er of invoices for each customer'}, {'role': 'assistant', 'content': ' SELEC
T CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerI
d'}, {'role': 'user', 'content': "which table stores customer's orders"},
{'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, Inv
oiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, Billing
PostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'How many cu
stomers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS Nu
mberOfCustomers 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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5'}, {'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 ON
a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'Find all tracks wit
h a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'con
tent': " SELECT * FROM tracks\nWHERE 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 an
d the total amount invoiced:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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    B
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 \"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 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
RCHAR(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\n    City 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 \"customers\"\r\n(\r\n    CustomerId INTEGER
PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    FirstName NVARCHAR(40)  NOT NUL
L,\r\n    LastName NVARCHAR(20)  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\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
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 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\nCREATE 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
EGER  NOT NULL,\r\n    FOREIGN KEY (ArtistId) REFERENCES \"artists\" (Artist
Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"p
laylist_track\"\r\n(\r\n    PlaylistId INTEGER  NOT NULL,\r\n    TrackId INT
EGER  NOT NULL,\r\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId,
TrackId),\r\n    FOREIGN KEY (PlaylistId) REFERENCES \"playlists\" (Playlist
Id) \r\n\t\tON 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\n===Additional Context \n\nIn the chinook database invoic
e 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 '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 * FROM invoices WHERE Total > 10"},
{"role": "user", "content": "Find the total number of invoices per countr
y"}, {"role": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS T
otalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "co
ntent": "Get the total number of invoices for each customer"}, {"role": "ass
istant", "content": " SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM inv
oices\nGROUP BY CustomerId"}, {"role": "user", "content": "which table store
s customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT Inv
oiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState,
BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user",
"content": "How many customers are there"}, {"role": "assistant", "content":
"SELECT COUNT(*) AS NumberOfCustomers FROM customers"}, {"role": "user", "co
ntent": "\n   For the question what are the top 5 countries that custom
ers come from?, \n   the generated SQL statement SELECT BillingCountr
y, 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 CustomerCount\nFR
OM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5
\n Execution failed on sql ' SELECT BillingCountry, COUNT(*) AS CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5': no such column: BillingCountry .\n   Please fix the error and re
-generate the SQL\n   "}, {"role": "assistant", "content": "SELECT coun
try AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY co
untry\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"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 a
lbums a\nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "co
ntent": "Find all tracks with a name containing \"What\" (case-insensitive)
"}, {"role": "assistant", "content": " SELECT * FROM tracks\nWHERE LOWER(Nam
e) LIKE '%what%'"}, {"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": "Find
all invoices since 2010 and the total amount invoiced:"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:20:41.858
846298Z', 'message': {'role': 'assistant', 'content': " SELECT InvoiceId, Cu
stomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-0
1';"}, 'done_reason': 'stop', 'done': True, 'total_duration': 57124861502,
'load_duration': 7623058, 'prompt_eval_count': 1850, 'prompt_eval_duration':
53043659000, 'eval_count': 32, 'eval_duration': 2722359000}

[(LLM Response)]

```
 SELECT InvoiceId, CustomerId, InvoiceDate, Total
FROM invoices
WHERE InvoiceDate >= '2010-01-01';

[( Output from LLM )]
  SELECT InvoiceId, CustomerId, InvoiceDate, Total
FROM invoices
WHERE InvoiceDate >= '2010-01-01';
[( Extracted SQL )]
 SELECT InvoiceId, CustomerId, InvoiceDate, Total
FROM invoices
WHERE InvoiceDate >= '2010-01-01'
```

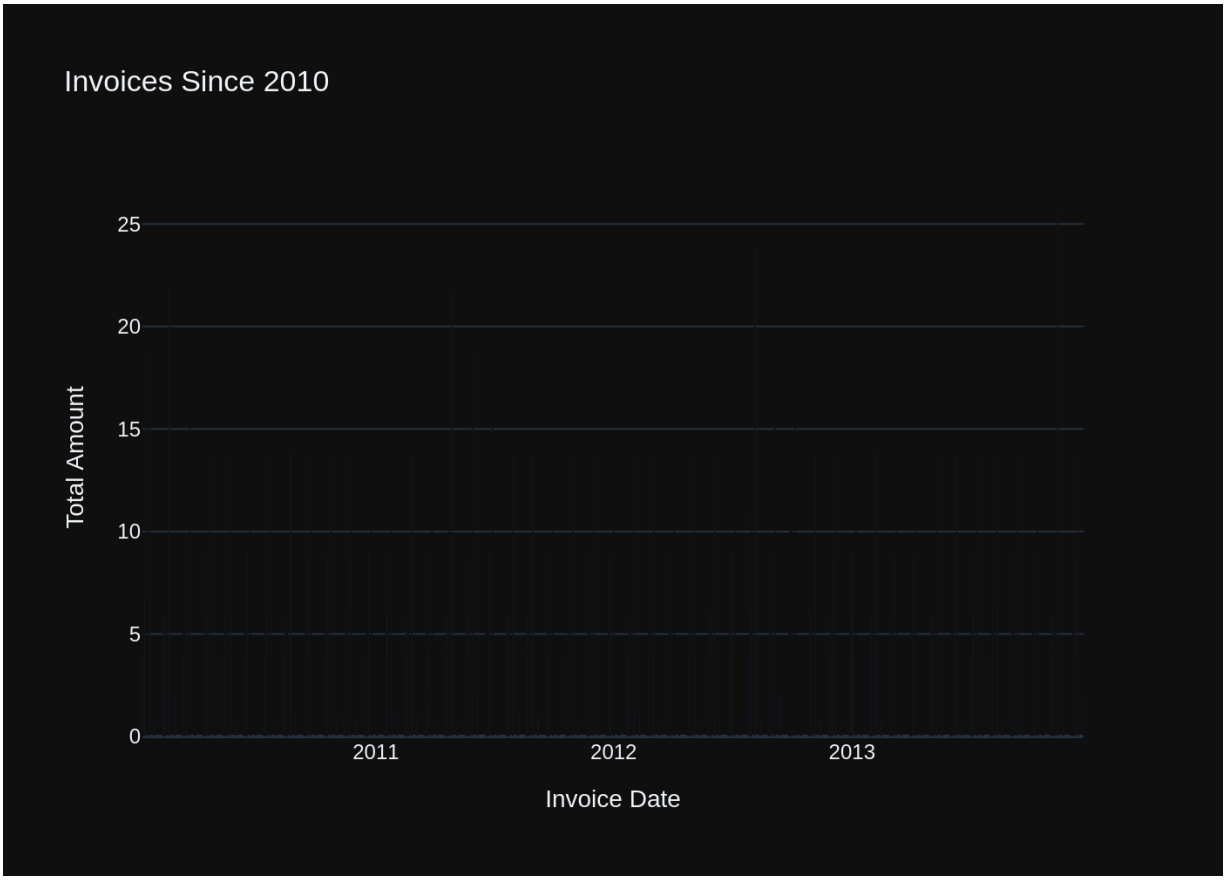
```
SELECT InvoiceId, CustomerId, InvoiceDate, Total
FROM invoices
WHERE InvoiceDate >= '2010-01-01'
```

	InvoiceId	CustomerId	InvoiceDate	Total
0	84	43	2010-01-08 00:00:00	1.98
1	85	45	2010-01-08 00:00:00	1.98
2	86	47	2010-01-09 00:00:00	3.96
3	87	51	2010-01-10 00:00:00	6.94
4	88	57	2010-01-13 00:00:00	17.91
...	...	...	...	...
324	408	25	2013-12-05 00:00:00	3.96
325	409	29	2013-12-06 00:00:00	5.94
326	410	35	2013-12-09 00:00:00	8.91
327	411	44	2013-12-14 00:00:00	13.86
328	412	58	2013-12-22 00:00:00	1.99

329 rows × 4 columns

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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, CustomerId, InvoiceDate, To
tal\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'\n\nThe following is in
formation about the resulting pandas DataFrame 'df': \nRunning df.dtypes giv
es:\n InvoiceId        int64\nCustomerId       int64\nInvoiceDate     object
\nTotal          float64\ndtype: object"}, {"role": "user", "content": "Can
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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:20:56.830
194673Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\nimport pandas as pd\n\n# Check if the DataFrame ha
s more than one row\nif len(df) == 1:\n    fig = go.Figure(go.Indicator(\n
mode="number",\n        value=df[\'Total\'].values[0],\n        title={"tex
t": "Total Amount Invoiced"}\n    ))\nelse:\n    fig = go.Figure(data=[go.Ba
r(x=df[\'InvoiceDate\'], y=df[\'Total\'])])\n\nfig.update_layout(title=\'Inv
oices Since 2010\', xaxis_title=\'Invoice Date\', yaxis_title=\'Total Amount
\')\nfig.show()\n```'}, 'done_reason': 'stop', 'done': True, 'total_duratio
n': 14942227853, 'load_duration': 7387043, 'prompt_eval_count': 200, 'prompt
_eval_duration': 3978596000, 'eval_count': 159, 'eval_duration': 1083016900
0}
```

```python
import plotly.graph_objects as go
import pandas as pd

# Check if the DataFrame has more than one row
if len(df) == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=df['Total'].values[0],
        title={"text": "Total Amount Invoiced"}
    ))
else:
    fig = go.Figure(data=[go.Bar(x=df['InvoiceDate'], y=df['Total'])])

fig.update_layout(title='Invoices Since 2010', xaxis_title='Invoice Date', yaxis_title='Total Amount')
```




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

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


[( 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    First
Name NVARCHAR(20)  NOT NULL,\r\n    Title NVARCHAR(30),\r\n    ReportsTo INT
EGER,\r\n    BirthDate DATETIME,\r\n    HireDate DATETIME,\r\n    Address NV
ARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Coun
try 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\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
OT NULL,\r\n    LastName NVARCHAR(20)  NOT NULL,\r\n    Company NVARCHAR(8
0),\r\n    Address NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVAR
CHAR(40),\r\n    Country NVARCHAR(40),\r\n    PostalCode NVARCHAR(10),\r\n
Phone NVARCHAR(24),\r\n    Fax 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
RCHAR(40),\r\n    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 DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice_
items"\r\n(\r\n    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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
TABLE "artists"\r\n(\r\n    ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT N
ULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE TABLE "tracks"\r\n(\r\n    Tra
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
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 "genr
es" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n    FOREIG
N 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    Albu
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 sqlite_stat1(tbl,idx,stat)\n\n\n===Additional Contex
t \n\n\n   In the \'customers\' table, address column names do not have \'B
illing\' prefix, \n   e.g. country column name is \'country\', not \'Billin
gCountry\'\n   \n\nIn the chinook database invoice means order\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': "which tab
le stores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DIST
INCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, Billin
gState, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role':
'user', 'content': 'Find all invoices since 2010 and the total amount invoic
ed:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, Invoi
ceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role':
'user', 'content': 'Get the total number of invoices for each customer'},
{'role': 'assistant', 'content': ' SELECT CustomerId, COUNT(*) AS TotalInvoi
ces\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find
the total number of invoices per country'}, {'role': 'assistant', 'content':
' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY
BillingCountry'}, {'role': 'user', 'content': 'List all albums and their cor
responding artist names '}, {'role': 'assistant', 'content': 'SELECT a.Titl
e AS AlbumTitle, ar.Name AS ArtistName\nFROM albums a\nJOIN artists ar ON a.
ArtistId = ar.ArtistId'}, {'role': 'user', 'content': "\n   For the que
stion what are the top 5 countries that customers come from?, \n   the
generated SQL statement SELECT BillingCountry, COUNT(*) AS CustomerCount\nF
ROM 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 CustomerCount\nFROM customers\nGROUP BY BillingC
ountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql ' SEL
ECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bill
ingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCo
untry .\n   Please fix the error and re-generate the SQL\n   "},
{'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT(*)
AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount D
ESC\nLIMIT 5'}, {'role': 'user', 'content': 'List all invoices with a total
exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices W
HERE Total > 10'}, {'role': 'user', 'content': 'How many customers are ther
e'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers
FROM customers'}, {'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 a
ll tracks with a name containing "What" (case-insensitive) '}, {'role': 'ass
istant', 'content': " SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%wha
t%'"}, {'role': 'user', 'content': "List all employees and their reporting m
anager's name (if any):"}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   F
irstName NVARCHAR(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\n   City NVARCHAR(40),\r\n   State NVARCHAR(40),\r\n   Co
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\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
R(80),\r\n   Address NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State N
VARCHAR(40),\r\n   Country NVARCHAR(40),\r\n   PostalCode NVARCHAR(10),\r
\n   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
KEY AUTOINCREMENT NOT NULL,\r\n   CustomerId INTEGER NOT NULL,\r\n   Invo
iceDate DATETIME NOT NULL,\r\n   BillingAddress NVARCHAR(70),\r\n   Billi
ngCity NVARCHAR(40),\r\n   BillingState NVARCHAR(40),\r\n   BillingCountry
NVARCHAR(40),\r\n   BillingPostalCode NVARCHAR(10),\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
LE \"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
OT 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 \"artists\"\r\n(\r\n   ArtistId INTEGER PRIMARY
KEY AUTOINCREMENT NOT NULL,\r\n   Name NVARCHAR(120)\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   MediaType
Id INTEGER NOT NULL,\r\n   GenreId INTEGER,\r\n   Composer NVARCHAR(22
0),\r\n   Milliseconds INTEGER NOT NULL,\r\n   Bytes INTEGER,\r\n   Unit
Price NUMERIC(10,2) NOT NULL,\r\n   FOREIGN KEY (AlbumId) REFERENCES \"alb
ums\" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n   FORE
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
ENT NOT NULL,\r\n   Title NVARCHAR(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 sqlite_st
at1(tbl,idx,stat)\n\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). \n5. If the question has been asked and answ
ered before, please repeat the answer exactly as it was given before. \n"},
{"role": "user", "content": "which table stores customer's orders"}, {"rol
e": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceD
ate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPosta
lCode, Total\nFROM invoices"}, {"role": "user", "content": "Find all invoice
s since 2010 and the total amount invoiced:"}, {"role": "assistant", "conten
t": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE
InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "Get the total nu
mber of invoices for each customer"}, {"role": "assistant", "content": " SEL
ECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerI
d"}, {"role": "user", "content": "Find the total number of invoices per coun
try"}, {"role": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS
TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "c
ontent": "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": "us
er", "content": "\n   For the question what are the top 5 countries tha
t customers come from?, \n   the generated SQL statement SELECT Billin
gCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry
\nORDER BY CustomerCount DESC\nLIMIT 5 results in the following exception [E
RROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(*) AS Customer
Count\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC
\nLIMIT 5\n Execution failed on sql ' SELECT BillingCountry, COUNT(*) AS Cus
tomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount
DESC\nLIMIT 5': no such column: BillingCountry .\n   Please fix the err
or and re-generate the SQL\n   "}, {"role": "assistant", "content": "SE
LECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGR
OUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "user", "co
ntent": "List all invoices with a total exceeding $10"}, {"role": "assistan
t", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user",
"content": "How many customers are there"}, {"role": "assistant", "content":
"SELECT COUNT(*) AS NumberOfCustomers FROM customers"}, {"role": "user", "co
ntent": "Can you list all tables in the SQLite database catalog?"}, {"role":
"assistant", "content": "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {"role": "user", "content": "Find all tracks with a name containing
\"What\" (case-insensitive) "}, {"role": "assistant", "content": " SELECT *
FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content":
"List all employees and their reporting manager's name (if any):"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:21:53.640
745575Z', 'message': {'role': 'assistant', 'content': ' SELECT e.FirstName,
e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastName\n
FROM employees e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId;'}, 'd
one_reason': 'stop', 'done': True, 'total_duration': 56696198017, 'load_dura
tion': 6869050, 'prompt_eval_count': 1816, 'prompt_eval_duration': 515880440
00, 'eval_count': 43, 'eval_duration': 3640299000}

[(LLM Response)]
 SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastName

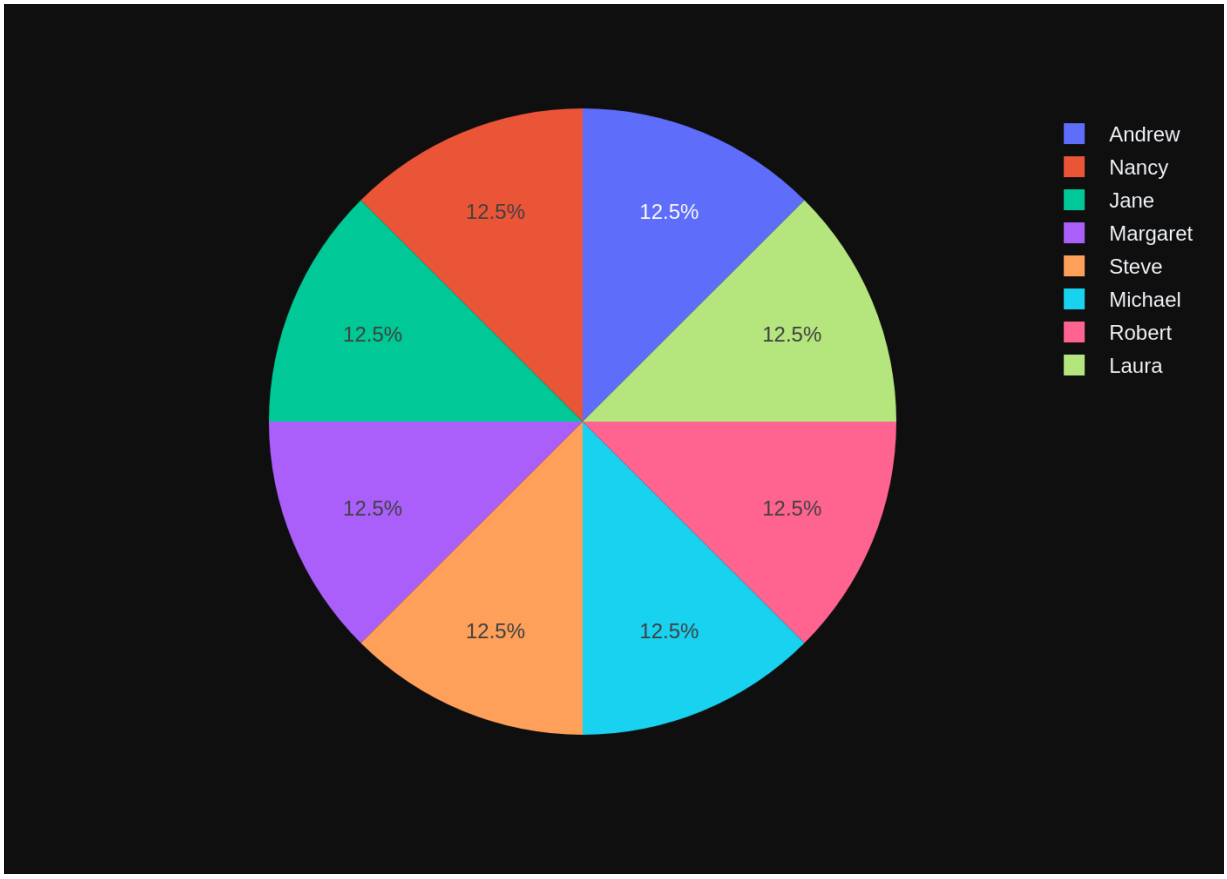
```
AS ManagerLastName
FROM employees e
LEFT JOIN employees m ON e.ReportsTo = m.EmployeeId;

[( Output from LLM )]
  SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastNam
e AS ManagerLastName
FROM employees e
LEFT JOIN employees m ON e.ReportsTo = m.EmployeeId;
[( Extracted SQL )]
 SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastName
AS ManagerLastName
FROM employees e
LEFT JOIN employees m ON e.ReportsTo = m.EmployeeId
```

```
SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS Man
agerLastName
FROM employees e
LEFT JOIN employees m ON e.ReportsTo = m.EmployeeId
```

	FirstName	LastName	ManagerFirstName	ManagerLastName
0	Andrew	Adams	None	None
1	Nancy	Edwards	Andrew	Adams
2	Jane	Peacock	Nancy	Edwards
3	Margaret	Park	Nancy	Edwards
4	Steve	Johnson	Nancy	Edwards
5	Michael	Mitchell	Andrew	Adams
6	Robert	King	Michael	Mitchell
7	Laura	Callahan	Michael	Mitchell

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 e.FirstName, e.LastName, m.FirstNa
me AS ManagerFirstName, m.LastName AS ManagerLastName\nFROM employees e\nLEF
T JOIN employees m ON e.ReportsTo = m.EmployeeId\n\nThe following is informa
tion about the resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n
FirstName           object\nLastName            object\nManagerFirstName
object\nManagerLastName     object\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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:22:12.095
13988Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport plo
tly.graph_objects as go\nimport pandas as pd\n\n# Assuming df is your DataFr
ame\nif len(df) == 1:\n    fig = go.Figure(go.Indicator(\n        mode="numb
er",\n        value=len(df),\n        title={"text": f"{df[\'FirstName\'].il
oc[0]} {df[\'LastName\'].iloc[0]}\'s Manager" if pd.notna(df[\'ManagerFirstN
ame\'].iloc[0]) else "No Manager", "font": {"size": 24}},\n        number=
{"prefix": "", "suffix": ""}\n    ))\nelse:\n    fig = go.Figure(data=[go.Ta
ble(header=dict(values=[\'First Name\', \'Last Name\', \'Manager First Name
\', \'Manager Last Name\']),\n                                    cells=dict(v
alues=[df[\'FirstName\'], df[\'LastName\'], df[\'ManagerFirstName\'], df[\'M
anagerLastName\'])])])\n```'}, 'done_reason': 'stop', 'done': True, 'total_du
ration': 18424368104, 'load_duration': 8075487, 'prompt_eval_count': 203, 'p
rompt_eval_duration': 3958144000, 'eval_count': 208, 'eval_duration': 143325
39000}
```

```
import plotly.graph_objects as go
import pandas as pd

# Assuming df is your DataFrame
if len(df) == 1:
    fig = go.Figure(go.Indicator(
        mode="number",
        value=len(df),
        title={"text": f"{df['FirstName'].iloc[0]} {df['LastName'].iloc[0]}'s Manager" if pd.notna(df['ManagerFirstName'].iloc[0]) else "No Manager", "font": {"size": 24}},
        number={"prefix": "", "suffix": ""}
    ))
else:
    fig = go.Figure(data=[go.Table(header=dict(values=['First Name', 'Last Name', 'Manager First Name', 'Manager Last Name']),
                     cells=dict(values=[df['FirstName'], df['LastName'], df['ManagerFirstName'], df['ManagerLastName']]))])
```




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

```
================================================================================
====
# QUESTION - 13:   Get the average invoice total 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    B
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_I
nvoiceLineInvoiceId ON "invoice_items" (InvoiceId)\n\nCREATE TABLE "invoice_
items"\r\n(\r\n    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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
LL,\r\n    LastName NVARCHAR(20)  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\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    BirthDat
e DATETIME,\r\n    HireDate DATETIME,\r\n    Address NVARCHAR(70),\r\n    Ci
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
4),\r\n    Email NVARCHAR(60),\r\n    FOREIGN KEY (ReportsTo) REFERENCES "em
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
\n\n    In the \'customers\' table, address column names do not have \'Billi
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': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': ' SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'List all invoices with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': "which table stores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers 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\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 BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5'}, {'role': 'user', 'content': "List all employees and their reporting manager's name (if any):"}, {'role': 'assistant', 'content': 'SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastName\nFROM employees e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId'}, {'role': 'user', 'content': 'Find all tracks with a name containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': " SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'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.ArtistId'}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
options={},
keep_alive=None

[(Prompt Content)]
[{"role": "system", "content": "You are a SQLite expert. Please help to generate 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 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(40),\r\n 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 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 \"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   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 ACTION\r\n)\n\nCREATE INDEX IFK_InvoiceLineTrackId ON \"invoice_items\" (TrackId)\n\nCREATE TABLE sqlite_stat1(tbl,idx,stat)\n\nCREATE INDEX IFK_CustomerSupportRepId ON \"customers\" (SupportRepId)\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\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   Fax NVARCHAR(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId INTEGER,\r\n   FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK_EmployeeReportsTo ON \"employees\" (ReportsTo)\n\nCREATE TABLE \"employees\"\r\n(\r\n   EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT 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   BirthDate 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\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\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   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 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 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": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": " SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "List all invoices with a total exceeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user", "content": "which table stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers FROM customers"},

{"role": "user", "content": "\n   For the question what are the top 5 c
ountries that customers come from?, \n   the generated SQL statement S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\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 Customer
Count DESC\nLIMIT 5\n Execution failed on sql ' SELECT BillingCountry, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY Cust
omerCount DESC\nLIMIT 5': no such column: BillingCountry .\n   Please f
ix the error and re-generate the SQL\n   "}, {"role": "assistant", "con
tent": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM cus
tomers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role":
"user", "content": "List all employees and their reporting manager's name (i
f any):"}, {"role": "assistant", "content": "SELECT e.FirstName, e.LastName,
m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastName\nFROM employe
es e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId"}, {"role": "use
r", "content": "Find all tracks with a name containing \"What\" (case-insens
itive) "}, {"role": "assistant", "content": " SELECT * FROM tracks\nWHERE LO
WER(Name) LIKE '%what%'"}, {"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 artists
ar ON a.ArtistId = ar.ArtistId"}, {"role": "user", "content": " Get the aver
age invoice total for each customer:"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:22:58.698
337866Z', 'message': {'role': 'assistant', 'content': ' SELECT CustomerId, A
VG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId'}, 'don
e_reason': 'stop', 'done': True, 'total_duration': 46501902258, 'load_durati
on': 8127573, 'prompt_eval_count': 1583, 'prompt_eval_duration': 4339629700
0, 'eval_count': 21, 'eval_duration': 1676645000}

[(LLM Response)]

```
 SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal
FROM invoices
GROUP BY CustomerId
```

SELECT CustomerId, **AVG**(Total) **AS** AverageInvoiceTotal

FROM invoices

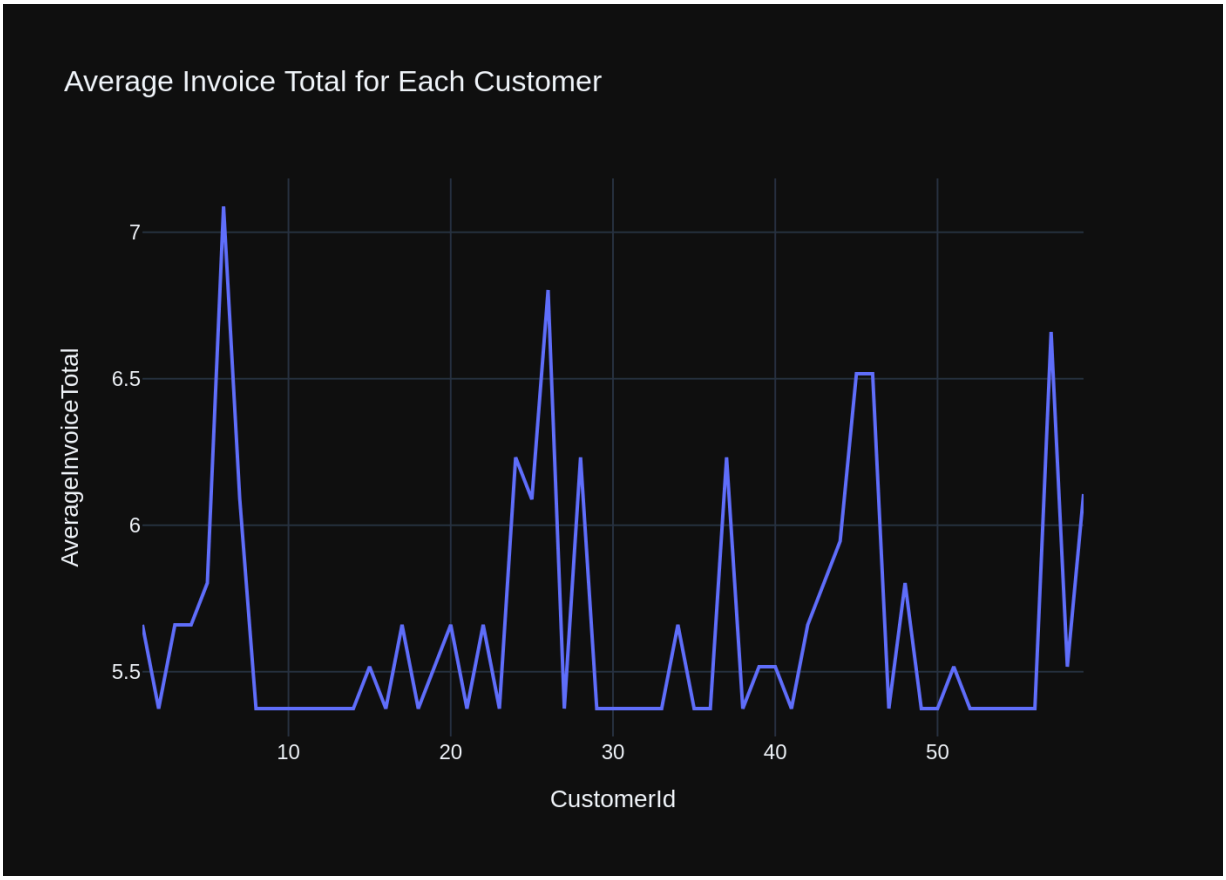
GROUP BY CustomerId

	CustomerId	AverageInvoiceTotal
0	1	5.660000
1	2	5.374286
2	3	5.660000
3	4	5.660000
4	5	5.802857
5	6	7.088571
6	7	6.088571
7	8	5.374286
8	9	5.374286
9	10	5.374286
10	11	5.374286
11	12	5.374286
12	13	5.374286
13	14	5.374286
14	15	5.517143
15	16	5.374286
16	17	5.660000
17	18	5.374286
18	19	5.517143
19	20	5.660000
20	21	5.374286
21	22	5.660000
22	23	5.374286
23	24	6.231429
24	25	6.088571
25	26	6.802857
26	27	5.374286
27	28	6.231429
28	29	5.374286
29	30	5.374286
30	31	5.374286
31	32	5.374286
32	33	5.374286
33	34	5.660000

	CustomerId	AverageInvoiceTotal
34	35	5.374286
35	36	5.374286
36	37	6.231429
37	38	5.374286
38	39	5.517143
39	40	5.517143
40	41	5.374286
41	42	5.660000
42	43	5.802857
43	44	5.945714
44	45	6.517143
45	46	6.517143
46	47	5.374286
47	48	5.802857
48	49	5.374286
49	50	5.374286
50	51	5.517143
51	52	5.374286
52	53	5.374286
53	54	5.374286
54	55	5.374286
55	56	5.374286
56	57	6.660000
57	58	5.517143
58	59	6.106667

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 CustomerId, AVG(Total) AS AverageInvoiceTotal\n
FROM invoices\nGROUP BY CustomerId\n\nThe following is information about the
resulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n CustomerId
int64\nAverageInvoiceTotal    float64\ndtype: object"}, {"role": "user", "co
ntent": "Can you generate 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 with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:23:05.366
198279Z', 'message': {'role': 'assistant', 'content': " ```python\nimport pl
otly.express as px\n\nfig = px.line(df, x='CustomerId', y='AverageInvoiceTot
al', title='Average Invoice Total for Each Customer')\nfig.show()\n```"}, 'd
one_reason': 'stop', 'done': True, 'total_duration': 6638085692, 'load_durat
ion': 8315588, 'prompt_eval_count': 173, 'prompt_eval_duration': 3390614000,
'eval_count': 48, 'eval_duration': 3112056000}
```

```python
import plotly.express as px

fig = px.line(df, x='CustomerId', y='AverageInvoiceTotal', title='Average Invoice Total for Each Customer')
```




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

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


[( 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    Albu
mId INTEGER,\r\n    MediaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\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 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    Invo
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
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_tra
ck"\r\n(\r\n    PlaylistId INTEGER  NOT NULL,\r\n    TrackId INTEGER  NOT NU
LL,\r\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, TrackId),\r
\n    FOREIGN KEY (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tO
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    FOR
EIGN KEY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACT
ION ON UPDATE NO ACTION\r\n)\n\n\n===Additional Context \n\nIn the chinook d
atabase invoice means order\n\n\n    In the \'customers\' table, address col
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': "
SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'c
```

ontent': 'List all invoices with a total exceeding $10'}, {'role': 'assistan
t', 'content': ' SELECT * FROM invoices WHERE Total > 10'}, {'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'}, {'role':
'user', 'content': 'Find all invoices since 2010 and the total amount invoic
ed:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, Invoi
ceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role':
'user', 'content': ' Get the average invoice total for each customer:'}, {'r
ole': 'assistant', 'content': ' SELECT CustomerId, AVG(Total) AS AverageInvo
iceTotal\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content':
'Find the total number of invoices per country'}, {'role': 'assistant', 'con
tent': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGR
OUP BY BillingCountry'}, {'role': 'user', 'content': "which table stores cus
tomer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceI
d, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, Billi
ngCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'user', 'cont
ent': 'Can you list all tables in the SQLite database catalog?'}, {'role':
'assistant', 'content': "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {'role': 'user', 'content': 'How many customers are there'}, {'role':
'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers FROM customer
s'}, {'role': 'user', 'content': "\n   For the question what are the to
p 5 countries that customers come from?, \n   the generated SQL stateme
nt SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP
BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5 results in the follo
wing exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COU
NT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY Cu
stomerCount DESC\nLIMIT 5\n Execution failed on sql ' SELECT BillingCountry,
COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY
CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n   Plea
se fix the error and re-generate the SQL\n   "}, {'role': 'assistant',
'content': 'SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM
customers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5'}, {'rol
e': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit
price):'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   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 (MediaTy
peId) REFERENCES \"media_types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O
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   UnitPr
ice NUMERIC(10,2) NOT NULL,\r\n   Quantity INTEGER NOT NULL,\r\n   FOREI
GN 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 ACTION\r\n)\n\nCREATE
TABLE \"playlist_track\"\r\n(\r\n   PlaylistId INTEGER NOT NULL,\r\n   Tr
ackId INTEGER NOT NULL,\r\n   CONSTRAINT PK_PlaylistTrack PRIMARY KEY (Pl
aylistId, 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\" (TrackId) \r\n\t\tON 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   ArtistId IN
TEGER NOT NULL,\r\n   FOREIGN KEY (ArtistId) REFERENCES \"artists\" (Artis
tId) \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\n\n   In the 'cus
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 * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"},
{"role": "user", "content": "List all invoices with a total exceeding $10"},
{"role": "assistant", "content": " SELECT * FROM invoices WHERE Total > 1
0"}, {"role": "user", "content": "List all albums and their corresponding ar
tist names "}, {"role": "assistant", "content": "SELECT a.Title AS AlbumTit
le, ar.Name AS ArtistName\nFROM albums a\nJOIN artists ar ON a.ArtistId = a
r.ArtistId"}, {"role": "user", "content": "Find all invoices since 2010 and
the total amount invoiced:"}, {"role": "assistant", "content": "SELECT Invoi
ceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2
010-01-01'"}, {"role": "user", "content": " Get the average invoice total fo
r each customer:"}, {"role": "assistant", "content": " SELECT CustomerId, AV
G(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId"}, {"rol
e": "user", "content": "Find the total number of invoices per country"}, {"r
ole": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvo
ices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content":
"which table stores customer's orders"}, {"role": "assistant", "content": "S
ELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCi
ty, BillingState, BillingCountry, BillingPostalCode, Total\nFROM 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 th
ere"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomer
s FROM customers"}, {"role": "user", "content": "\n   For the question
what are the top 5 countries that customers come from?, \n   the genera

```
ted SQL statement  SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM cu
stomers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5 resul
ts in the following exception [ERROR-DB] Failed to execute SQL:  SELECT Bill
ingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCount
ry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql ' SELECT
BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingC
ountry\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 AS Top5Countries, COUNT(*) AS Cu
stomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\n
LIMIT 5"}, {"role": "user", "content": "Find the top 5 most expensive tracks
(based on unit price):"}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:23:47.223
773233Z', 'message': {'role': 'assistant', 'content': ' SELECT Name, UnitPri
ce\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5'}, 'done_reason': 'stop',
'done': True, 'total_duration': 41766671846, 'load_duration': 7690130, 'prom
pt_eval_count': 1445, 'prompt_eval_duration': 38828730000, 'eval_count': 19,
'eval_duration': 1515956000}

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

SELECT Name, UnitPrice

FROM tracks

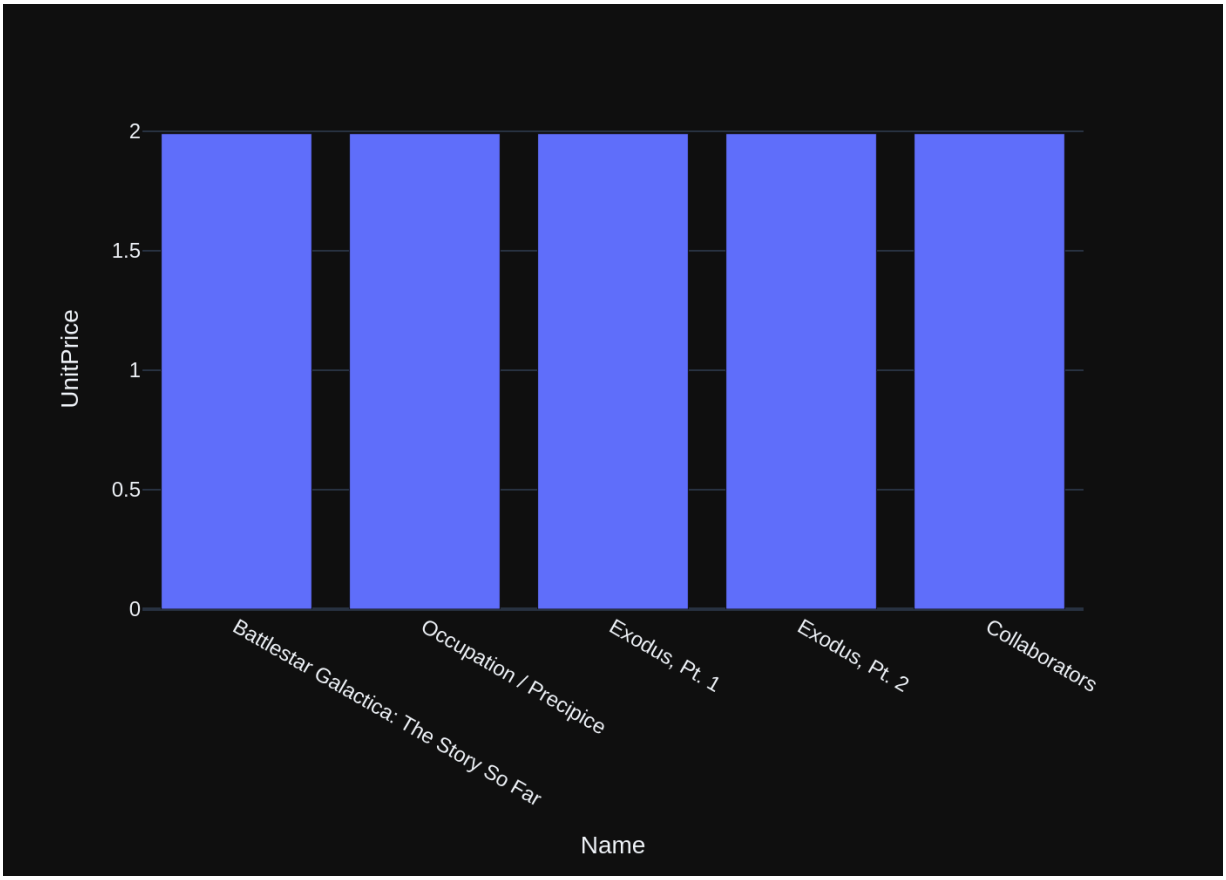
ORDER BY UnitPrice **DESC**

LIMIT 5

	Name	UnitPrice
0	Battlestar Galactica: The Story So Far	1.99
1	Occupation / Precipice	1.99
2	Exodus, Pt. 1	1.99
3	Exodus, Pt. 2	1.99
4	Collaborators	1.99

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 Name, UnitPrice\nFROM tracks\nORDER B
Y UnitPrice DESC\nLIMIT 5\n\nThe following is information about the resultin
g pandas DataFrame 'df': \nRunning df.dtypes gives:\n Name          object\n
UnitPrice    float64\ndtype: object"}, {"role": "user", "content": "Can you
generate the Python plotly code to chart the results of the dataframe? Assum
e 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 an
swer with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:23:59.687
860558Z', 'message': {'role': 'assistant', 'content': " ```python\nimport pl
otly.express as px\n\nif df['UnitPrice'].nunique() == 1:\n    fig = px.indic
ator(value=df['UnitPrice'][0], title='Top 5 Most Expensive Tracks by Unit Pr
ice')\nelse:\n    fig = px.bar(df, x='Name', y='UnitPrice', text='UnitPric
e', title='Top 5 Most Expensive Tracks by Unit Price')\n\nfig.update_xaxes(t
itle_text='Track Name')\nfig.update_yaxes(title_text='Unit Price')\nfig.show
()\n```"}, 'done_reason': 'stop', 'done': True, 'total_duration': 1243194343
0, 'load_duration': 8091242, 'prompt_eval_count': 173, 'prompt_eval_duratio
n': 3317589000, 'eval_count': 134, 'eval_duration': 8981050000}
```

```python
import plotly.express as px

if df['UnitPrice'].nunique() == 1:
    fig = px.indicator(value=df['UnitPrice'][0], title='Top 5 Most Expensive Tracks by Unit Price')
else:
    fig = px.bar(df, x='Name', y='UnitPrice', text='UnitPrice', title='Top 5 Most Expensive Tracks by Unit Price')

fig.update_xaxes(title_text='Track Name')
fig.update_yaxes(title_text='Unit Price')
```




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

```
================================================================================
====
# 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    Albu
mId INTEGER,\r\n    MediaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\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 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_TrackGenreId ON "tracks" (GenreId)\n
\nCREATE TABLE "genres"\r\n(\r\n    GenreId INTEGER PRIMARY KEY AUTOINCREMEN
T NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK_PlaylistTrack
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
NOT NULL,\r\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, Track
Id),\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\n===Additional Context \n\nIn the c
hinook database invoice means order\n\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 Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'r
ole': 'user', 'content': 'List all albums and their corresponding artist nam
es  '}, {'role': 'assistant', 'content': 'SELECT a.Title AS AlbumTitle, ar.N
ame AS ArtistName\nFROM albums a\nJOIN artists ar ON a.ArtistId = ar.ArtistI
d'}, {'role': 'user', 'content': 'Find all tracks with a name containing "Wh
at" (case-insensitive) '}, {'role': 'assistant', 'content': " SELECT * FROM
```

tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'content': 'How many customers are ther e'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers FROM customers'}, {'role': 'user', 'content': 'List all invoices with a tota l exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total > 10'}, {'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': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'con tent': ' SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find all invoices since 2010 a nd the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT In voiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': "which table stores customer's o rders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, Custom erId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountr y, BillingPostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'L ist all genres and the number of tracks in each genre:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   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 (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   Playl 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 (PlaylistId, TrackId),\r\n   FOREIGN KEY (PlaylistId) REFERENCES \"playlist s\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n   FOR EIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTI ON ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"albums\"\r\n(\r\n   AlbumId I NTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Title NVARCHAR(160) NOT N ULL,\r\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\n===Add

itional 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 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 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 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": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "content": " SELECT 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, 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 * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers FROM customers"}, {"role": "user", "content": "List all invoices with a total exceeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices 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 CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "which table stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": "List all genres and the number of tracks in each genre:"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:24:36.164672734Z', 'message': {'role': 'assistant', 'content': ' intermediate_sql\nSELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.GenreId'}, 'done_reason': 'stop', 'done': True, 'total_duration': 36386913789, 'load_duration': 8345351, 'prompt_eval_count': 1210, 'prompt_eval_duration': 30863716000, 'eval_count': 52, 'eval_duration': 4106143000}

[(LLM Response)]

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

```
[( Running Intermediate SQL )]
  intermediate_sql
SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks
FROM genres g
LEFT JOIN tracks t ON g.GenreId = t.GenreId
GROUP BY g.GenreId

[( Final 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    Albu
mId INTEGER,\r\n    MediaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\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 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_TrackGenreId ON "tracks" (GenreId)\n
\nCREATE TABLE "genres"\r\n(\r\n    GenreId INTEGER PRIMARY KEY AUTOINCREMEN
T NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK_PlaylistTrack
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
NOT NULL,\r\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, Track
Id),\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\n===Additional Context \n\nIn the c
hinook database invoice means order\n\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\nThe following is a pand
as DataFrame with the results of the intermediate SQL query   intermediate_s
ql\nSELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM gen
res g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.GenreId: \n|
| GenreName          |   NumberOfTracks |\n|---:|:-------------------|------
-----------:|\n|  0 | Rock               |             1297 |\n|  1 | Jazz
|              130 |\n|  2 | Metal              |              374 |\n|  3 |
Alternative & Punk |              332 |\n|  4 | Rock And Roll      |
12 |\n|  5 | Blues              |               81 |\n|  6 | Latin
|              579 |\n|  7 | Reggae             |               58 |\n|  8 |
Pop                |               48 |\n|  9 | Soundtrack         |
43 |\n| 10 | Bossa Nova         |               15 |\n| 11 | Easy Listening
|               24 |\n| 12 | Heavy Metal        |               28 |\n| 13 |
R&B/Soul           |               61 |\n| 14 | Electronica/Dance  |
30 |\n| 15 | World              |               28 |\n| 16 | Hip Hop/Rap
|               35 |\n| 17 | Science Fiction    |               13 |\n| 18 |
```

TV Shows | 93 |\n| 19 | Sci Fi & Fantasy | 26 |\n| 20 | Drama | 64 |\n| 21 | Comedy | 17 |\n| 22 | Alternative | 40 |\n| 23 | Classical | 74 |\n| 24 | Opera | 1 |\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 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 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': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': ' SELECT 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, 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 * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'content': 'How many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberOfCustomers FROM customers'}, {'role': 'user', 'content': 'List all invoices with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices 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 CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': "which table stores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'List all genres and the number of tracks in each genre:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
options={},
keep_alive=None

[(Prompt Content)]
[{"role": "system", "content": "You are a SQLite expert. Please help to generate 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 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 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 (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   Playl
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
(PlaylistId, TrackId),\r\n   FOREIGN KEY (PlaylistId) REFERENCES \"playlist
s\" (PlaylistId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n   FOR
EIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON DELETE NO ACTI
ON ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"albums\"\r\n(\r\n   AlbumId I
NTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Title NVARCHAR(160) NOT N
ULL,\r\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\n===Add
itional 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
e.g. country column name is 'country', not 'BillingCountry'\n   \n\nThe fol
lowing is a pandas DataFrame with the results of the intermediate SQL query
intermediate_sql\nSELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTr
acks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY
g.GenreId: \n| | GenreName | NumberOfTracks |\n|---:|:--------
-----------|-----------------:|\n| 0 | Rock | 129
7 |\n| 1 | Jazz | 130 |\n| 2 | Metal
| 374 |\n| 3 | Alternative & Punk | 332 |\n| 4 |
Rock And Roll | 12 |\n| 5 | Blues |
81 |\n| 6 | Latin | 579 |\n| 7 | Reggae
| 58 |\n| 8 | Pop | 48 |\n| 9 |
Soundtrack | 43 |\n| 10 | Bossa Nova |
15 |\n| 11 | Easy Listening | 24 |\n| 12 | Heavy Metal
| 28 |\n| 13 | R&B/Soul | 61 |\n| 14 |
Electronica/Dance | 30 |\n| 15 | World |
28 |\n| 16 | Hip Hop/Rap | 35 |\n| 17 | Science Fiction
| 13 |\n| 18 | TV Shows | 93 |\n| 19 |
Sci Fi & Fantasy | 26 |\n| 20 | Drama |
64 |\n| 21 | Comedy | 17 |\n| 22 | Alternative
| 40 |\n| 23 | Classical | 74 |\n| 24 |
Opera | 1 |\n\n===Response Guidelines \n1. If th
e provided context is sufficient, please generate a valid SQL query without
any explanations for the question. \n2. If the provided context is almost su
fficient but requires knowledge of a specific string in a particular column,
please generate an intermediate SQL query to find the distinct strings in th
at column. Prepend the query with a comment saying intermediate_sql \n3. If
the provided context is insufficient, please explain why it can't be generat
ed. \n4. Please use the most relevant table(s). \n5. If the question has bee
n asked and answered before, please repeat the answer exactly as it was give
n before. \n"}, {"role": "user", "content": "Find the top 5 most expensive t
racks (based on unit price):"}, {"role": "assistant", "content": " SELECT Na
me, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"role": "us
er", "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"}, {"r
ole": "user", "content": "Find all tracks with a name containing \"What\" (c
ase-insensitive) "}, {"role": "assistant", "content": " SELECT * FROM tracks
\nWHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": "Find the t
otal number of invoices per country"}, {"role": "assistant", "content": " SE
LECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY Bill
ingCountry"}, {"role": "user", "content": "How many customers are there"},
{"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers FROM
customers"}, {"role": "user", "content": "List all invoices with a total exc
eeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices WHER
E Total > 10"}, {"role": "user", "content": "Can you list all tables in the
SQLite database catalog?"}, {"role": "assistant", "content": "SELECT name FR
OM sqlite_master WHERE type='table'"}, {"role": "user", "content": "Get the
total number of invoices for each customer"}, {"role": "assistant", "conten
t": " SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY
CustomerId"}, {"role": "user", "content": "Find all invoices since 2010 and
the total amount invoiced:"}, {"role": "assistant", "content": "SELECT Invoi
ceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2
010-01-01'"}, {"role": "user", "content": "which table stores customer's ord
ers"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, Customer
Id, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry,
BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": "List
all genres and the number of tracks in each genre:"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:25:11.871
325796Z', 'message': {'role': 'assistant', 'content': ' intermediate_sql\nSE
LECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g
\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.GenreId'}, 'done_r
eason': 'stop', 'done': True, 'total_duration': 35704325405, 'load_duratio
n': 7625282, 'prompt_eval_count': 1650, 'prompt_eval_duration': 29971753000,
'eval_count': 51, 'eval_duration': 4266061000}

[(LLM Response)]
 intermediate_sql

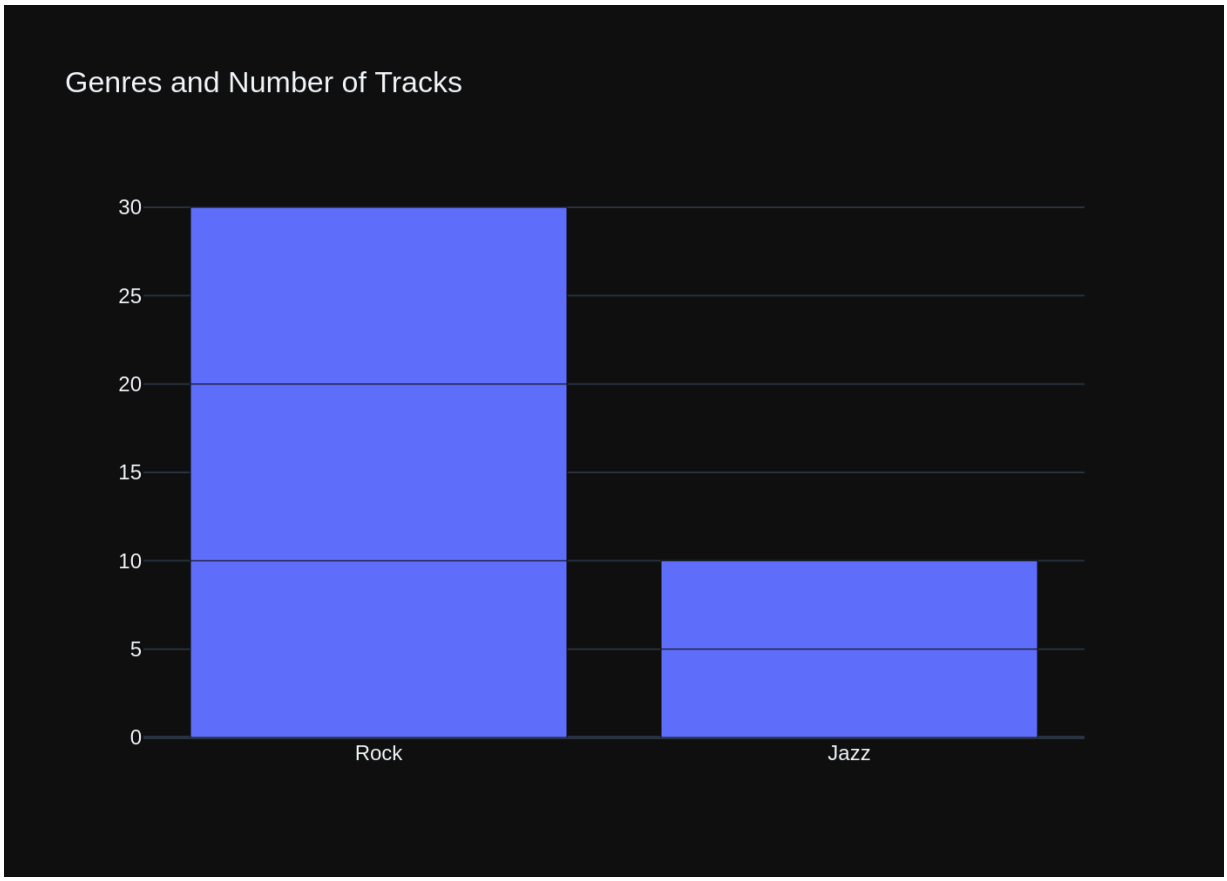
```
SELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks
FROM genres g
LEFT JOIN tracks t ON g.GenreId = t.GenreId
GROUP BY g.GenreId
```

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

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

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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:  \nSELECT g.Name AS GenreName, COUNT(t.TrackId) A
S NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId
\nGROUP BY g.GenreId\n\nThe following is information about the resulting pan
das DataFrame 'df': \nRunning df.dtypes gives:\n GenreName         object\nN
umberOfTracks     int64\ndtype: object"}, {"role": "user", "content": "Can y
ou generate the Python plotly code to chart the results of the dataframe? As
sume the data is in a pandas dataframe called 'df'. If there is only one val
ue in the dataframe, use an Indicator. Respond with only Python code. Do not
answer with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:25:31.417
208977Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objs as go\nfrom plotly.subplots import make_subplots\nimport pan
das as pd\n\ndf = pd.DataFrame({\n    \'GenreName\': [\'Rock\', \'Rock\',
\'Rock\', \'Jazz\', \'Jazz\'],\n    \'NumberOfTracks\': [10, 10, 10, 5, 5]
\n})\n\nfig = make_subplots(rows=1, cols=1)\n\nif df[\'NumberOfTracks\'].nun
ique() == 1:\n    fig.add_trace(go.Indicator(\n        mode="number",\n
value=df[\'NumberOfTracks\'].iloc[0],\n        title={"text": "Number of Tra
cks per Genre"}\n    ))\nelse:\n    fig.add_bar(x=df[\'GenreName\'], y=df
[\'NumberOfTracks\'], name=\'Number of Tracks\')\n\nfig.update_layout(title_
text="Genres and Number of Tracks")\nfig.show()\n```'}, 'done_reason': 'sto
p', 'done': True, 'total_duration': 19517417824, 'load_duration': 8236385,
'prompt_eval_count': 201, 'prompt_eval_duration': 3929305000, 'eval_count':
226, 'eval_duration': 15455523000}
```

```
import plotly.graph_objs as go
from plotly.subplots import make_subplots
import pandas as pd

df = pd.DataFrame({
    'GenreName': ['Rock', 'Rock', 'Rock', 'Jazz', 'Jazz'],
    'NumberOfTracks': [10, 10, 10, 5, 5]
})

fig = make_subplots(rows=1, cols=1)

if df['NumberOfTracks'].nunique() == 1:
    fig.add_trace(go.Indicator(
        mode="number",
        value=df['NumberOfTracks'].iloc[0],
        title={"text": "Number of Tracks per Genre"}
    ))
else:
    fig.add_bar(x=df['GenreName'], y=df['NumberOfTracks'], name='Number of Tracks')

fig.update_layout(title_text="Genres and Number of Tracks")
```




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

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


[( 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    F
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\tON 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    Genre
Id INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name NVARCHAR(120)\r
\n)\n\nCREATE 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
ER  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 "playli
st_track"\r\n(\r\n    PlaylistId INTEGER  NOT NULL,\r\n    TrackId INTEGER
NOT NULL,\r\n    CONSTRAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, Track
Id),\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
BLE "playlists"\r\n(\r\n    PlaylistId 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 column names do not have \'Billing\' prefi
x, \n    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': ' \nSELE
CT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nL
EFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.GenreId'}, {'role':
'user', 'content': 'Find all tracks with a name containing "What" (case-inse
nsitive) '}, {'role': 'assistant', 'content': " SELECT * FROM tracks\nWHERE
LOWER(Name) LIKE '%what%'"}, {'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 artis
ts ar ON a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': 'Find the t
op 5 most expensive tracks (based on unit price):'}, {'role': 'assistant',
'content': ' SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nL
IMIT 5'}, {'role': 'user', 'content': 'Can you list all tables in the SQLite
database catalog?'}, {'role': 'assistant', 'content': "SELECT name FROM sqli
te_master WHERE type='table'"}, {'role': 'user', 'content': 'List all invoic
es with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT *
FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'Find all invo
ices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'con
tent': "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHE
RE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': "which table s
tores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT
InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingStat
e, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'use
r', 'content': 'Find the total number of invoices per country'}, {'role': 'a
ssistant', 'content': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFR
OM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'content': "List al
l employees and their reporting manager's name (if any):"}, {'role': 'assist
ant', 'content': 'SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirs
tName, m.LastName AS ManagerLastName\nFROM employees e\nLEFT JOIN employees
m ON e.ReportsTo = m.EmployeeId'}, {'role': 'user', 'content': 'Get all genr
es that do not have any tracks associated with them:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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
T 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 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\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
\n(\r\n   GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Name N
VARCHAR(120)\r\n)\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   FOR

EIGN KEY (TrackId) REFERENCES \"tracks\" (TrackId) \r\n\t\tON 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   PlaylistId INTEGER PRIM
ARY KEY AUTOINCREMENT NOT NULL,\r\n   Name NVARCHAR(120)\r\n)\n\n\n===Addit
ional Context \n\n\n   In the 'customers' table, address column names do no
t have 'Billing' prefix, \n   e.g. country column name is 'country', not 'B
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": " \nSELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfT
racks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY
g.GenreId"}, {"role": "user", "content": "Find all tracks with a name contai
ning \"What\" (case-insensitive) "}, {"role": "assistant", "content": " SELE
CT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {"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\nF
ROM albums a\nJOIN artists ar ON a.ArtistId = ar.ArtistId"}, {"role": "use
r", "content": "Find the top 5 most expensive tracks (based on unit pric
e):"}, {"role": "assistant", "content": " SELECT Name, UnitPrice\nFROM track
s\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"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": "use
r", "content": "List all invoices with a total exceeding $10"}, {"role": "as
sistant", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role":
"user", "content": "Find all invoices since 2010 and the total amount invoic
ed:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, Invoi
ceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role":
"user", "content": "which table stores customer's orders"}, {"role": "assist
ant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, Billin
gAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Tota
l\nFROM invoices"}, {"role": "user", "content": "Find the total number of in
voices per country"}, {"role": "assistant", "content": " SELECT BillingCount
ry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"r
ole": "user", "content": "List all employees and their reporting manager's n
ame (if any):"}, {"role": "assistant", "content": "SELECT e.FirstName, e.Las
tName, m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastName\nFROM
employees e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId"}, {"role":
"user", "content": "Get all genres that do not have any tracks associated wi
th them:"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:26:08.528
16112Z', 'message': {'role': 'assistant', 'content': ' SELECT g.*\nFROM gen
res g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nWHERE t.TrackId IS NUL
L'}, 'done_reason': 'stop', 'done': True, 'total_duration': 37030777695, 'lo
ad_duration': 8213078, 'prompt_eval_count': 1284, 'prompt_eval_duration': 33
055620000, 'eval_count': 32, 'eval_duration': 2563894000}

```
[( LLM Response )]
  SELECT g.*
FROM genres g
LEFT JOIN tracks t ON g.GenreId = t.GenreId
WHERE t.TrackId IS NULL
```

```
SELECT g.*
FROM genres g
LEFT JOIN tracks t ON g.GenreId = t.GenreId
WHERE t.TrackId IS NULL
```

GenreId	Name

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

```
================================================================================
====
# QUESTION - 17:  List all customers who have not placed any 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    B
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
\n    PostalCode NVARCHAR(10),\r\n    Phone NVARCHAR(24),\r\n    Fax NVARCHA
R(24),\r\n    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
(\r\n    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    In
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    FOREIGN
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
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    BirthDat
e DATETIME,\r\n    HireDate DATETIME,\r\n    Address NVARCHAR(70),\r\n    Ci
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
4),\r\n    Email NVARCHAR(60),\r\n    FOREIGN KEY (ReportsTo) REFERENCES "em
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
\n    TrackId INTEGER  NOT NULL,\r\n    CONSTRAINT PK_PlaylistTrack PRIMARY
KEY  (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\tON 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
LL,\r\n    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
CREMENT NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE TABLE "tracks"\r
\n(\r\n    TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name 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    Mill
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
TION,\r\n   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\n===Additional Context \n\n
\n   In the \'customers\' table, address column names do not have \'Billing
\' prefix, \n   e.g. country column name is \'country\', not \'BillingCount
ry\'\n   \n\nIn the chinook database invoice means order\n\n===Response Gui
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': "which table
stores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINC
T InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingSt
ate, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'us
er', 'content': 'How many customers are there'}, {'role': 'assistant', 'cont
ent': 'SELECT COUNT(*) AS NumberOfCustomers FROM customers'}, {'role': 'use
r', 'content': 'Find all invoices since 2010 and the total amount invoice
d:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, Invoic
eDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role':
'user', 'content': 'Get the total number of invoices for each customer'},
{'role': 'assistant', 'content': ' SELECT CustomerId, COUNT(*) AS TotalInvoi
ces\nFROM invoices\nGROUP BY CustomerId'}, {'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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5'}, {'role': 'user', 'content': ' Get the average invoice to
tal for each customer:'}, {'role': 'assistant', 'content': ' SELECT Customer
Id, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId'},
{'role': 'user', 'content': 'List all invoices with a total exceeding $10'},
{'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total > 1
0'}, {'role': 'user', 'content': "List all employees and their reporting man
ager's name (if any):"}, {'role': 'assistant', 'content': 'SELECT e.FirstNam
e, e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastNam
e\nFROM employees e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId'},
{'role': 'user', 'content': 'Find the total number of invoices per countr
y'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS T
otalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'co
ntent': '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': 'us
er', 'content': 'List all customers who have not placed any orders:'}]

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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    B
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
\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    Fax
NVARCHAR(24),\r\n    Email NVARCHAR(60)  NOT NULL,\r\n    SupportRepId INTEG
ER,\r\n    FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (EmployeeId)
\r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoi
ce_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
\n    UnitPrice NUMERIC(10,2)  NOT NULL,\r\n    Quantity INTEGER  NOT NUL
L,\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    Fi
rstName NVARCHAR(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\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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\tON DELETE NO ACTIO
N ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"playlist_track\"\r\n(\r\n    Pl
aylistId INTEGER  NOT NULL,\r\n    TrackId 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
ON 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 TAB
LE \"albums\"\r\n(\r\n    AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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\tO
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
(\r\n    PlaylistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name
NVARCHAR(120)\r\n)\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
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 (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\n===Additional Context \n\n\n   In the 'customers' tabl
e, address column names do not have 'Billing' prefix, \n   e.g. 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": "which table stores customer's orders"}, {"role": "as
sistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, Bi
llingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode,
Total\nFROM invoices"}, {"role": "user", "content": "How many customers are
there"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustom
ers FROM customers"}, {"role": "user", "content": "Find all invoices since 2
010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELE
CT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDa
te >= '2010-01-01'"}, {"role": "user", "content": "Get the total number of i
nvoices for each customer"}, {"role": "assistant", "content": " SELECT Custo
merId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"ro
le": "user", "content": "\n   For the question what are the top 5 count
ries that customers come from?, \n   the generated SQL statement SELEC
T BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Billin
gCountry\nORDER BY CustomerCount DESC\nLIMIT 5 results in the following exce
ption [ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(*) AS
CustomerCount\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 Customer
Count DESC\nLIMIT 5': no such column: BillingCountry .\n   Please fix t
he error and re-generate the SQL\n   "}, {"role": "assistant", "conten
t": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM custom
ers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "use
r", "content": " Get the average invoice total for each customer:"}, {"rol
e": "assistant", "content": " SELECT CustomerId, AVG(Total) AS AverageInvoic
eTotal\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "L
ist all invoices with a total exceeding $10"}, {"role": "assistant", "conten
t": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user", "content":
"List all employees and their reporting manager's name (if any):"}, {"role":
"assistant", "content": "SELECT e.FirstName, e.LastName, m.FirstName AS Mana
gerFirstName, m.LastName AS ManagerLastName\nFROM employees e\nLEFT JOIN emp
loyees m ON e.ReportsTo = m.EmployeeId"}, {"role": "user", "content": "Find
the total number of invoices per country"}, {"role": "assistant", "content":
" SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY
BillingCountry"}, {"role": "user", "content": "List all albums and their cor
responding artist names "}, {"role": "assistant", "content": "SELECT a.Titl
e AS AlbumTitle, ar.Name AS ArtistName\nFROM albums a\nJOIN artists ar ON a.
ArtistId = ar.ArtistId"}, {"role": "user", "content": "List all customers wh
o have not placed any orders:"}]

```
[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:27:08.449
147376Z', 'message': {'role': 'assistant', 'content': '  SELECT c.*\nFROM cu
stomers c\nLEFT JOIN invoices i ON c.CustomerId = i.CustomerId\nWHERE i.Invo
iceId IS NULL'}, 'done_reason': 'stop', 'done': True, 'total_duration': 5987
8820316, 'load_duration': 8277361, 'prompt_eval_count': 1946, 'prompt_eval_d
uration': 55688497000, 'eval_count': 32, 'eval_duration': 2714397000}

[( LLM Response )]
  SELECT c.*
FROM customers c
LEFT JOIN invoices i ON c.CustomerId = i.CustomerId
WHERE i.InvoiceId IS NULL
```

```
SELECT c.*
FROM customers c
LEFT JOIN invoices i ON c.CustomerId = i.CustomerId
WHERE i.InvoiceId IS NULL
```

CustomerId	FirstName	LastName	Company	Address	City	State	Country	PostalCode

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

```
================================================================================
====
# QUESTION - 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,

================================================================================
====


[( 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    Albu
mId INTEGER,\r\n    MediaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\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 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
(\r\n    ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name NV
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
(\r\n    GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Name NVA
RCHAR(120)\r\n)\n\nCREATE TABLE "playlist_track"\r\n(\r\n    PlaylistId INTE
GER  NOT NULL,\r\n    TrackId INTEGER  NOT NULL,\r\n    CONSTRAINT PK_Playli
stTrack 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" (TrackId) \r\n\t\tO
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\n===Additional Context \n\n\n    In the \'customers\' t
able, address column names do not have \'Billing\' prefix, \n    e.g. countr
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': ' \nSELECT g.Name AS Genr
eName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t
ON g.GenreId = t.GenreId\nGROUP BY g.GenreId'}, {'role': 'user', 'content':
'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'as
sistant', 'content': ' SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPri
ce DESC\nLIMIT 5'}, {'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 ON
a.ArtistId = ar.ArtistId'}, {'role': 'user', 'content': "\n   For the q
uestion what are the top 5 countries that customers come from?, \n   th
e generated SQL statement SELECT BillingCountry, COUNT(*) AS CustomerCount
\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMI
T 5 results in the following exception [ERROR-DB] Failed to execute SQL: SE
LECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bil
lingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Find all tracks with a name
containing "What" (case-insensitive) '}, {'role': 'assistant', 'content': "
SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'user', 'c
ontent': 'How many customers are there'}, {'role': 'assistant', 'content':
'SELECT COUNT(*) AS NumberOfCustomers FROM customers'}, {'role': 'user', 'co
ntent': 'Can you list all tables in the SQLite database catalog?'}, {'role':
'assistant', 'content': "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {'role': 'user', 'content': 'List all invoices with a total exceeding
$10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total
> 10'}, {'role': 'user', 'content': 'Find the total number of invoices per c
ountry'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*)
AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user',
'content': "which table stores customer's orders"}, {'role': 'assistant', 'c
ontent': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddres
s, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM
invoices'}, {'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 ar
e linked by ArtistId, albums and tracks are linked by AlbumId,\n   '}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   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 (MediaTy
peId) REFERENCES \"media_types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O
N UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"albums\"\r\n(\r\n   AlbumId INTEG
ER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Title NVARCHAR(160) NOT NUL
L,\r\n   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
ULL,\r\n   Name NVARCHAR(120)\r\n)\n\nCREATE 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   FOREI
GN KEY (PlaylistId) REFERENCES \"playlists\" (PlaylistId) \r\n\t\tON 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\n===Additional Context \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\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": " \nSELE
CT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nL
EFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.GenreId"}, {"role":
"user", "content": "Find the top 5 most expensive tracks (based on unit pric
e):"}, {"role": "assistant", "content": " SELECT Name, UnitPrice\nFROM track
s\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\nJ
OIN artists ar ON a.ArtistId = ar.ArtistId"}, {"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 Cust
omerCount 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 Execu
tion failed on sql ' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM
customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': n
o such column: BillingCountry .\n   Please fix the error and re-generat
e the SQL\n   "}, {"role": "assistant", "content": "SELECT country AS T
op5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY country\nO
RDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "user", "content": "Find all
tracks with a name containing \"What\" (case-insensitive) "}, {"role": "assi
stant", "content": " SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%wha
t%'"}, {"role": "user", "content": "How many customers are there"}, {"role":

"assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers FROM customer
s"}, {"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": "List all invoices w
ith a total exceeding $10"}, {"role": "assistant", "content": " SELECT * FRO
M invoices WHERE Total > 10"}, {"role": "user", "content": "Find the total n
umber of invoices per country"}, {"role": "assistant", "content": " SELECT B
illingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCou
ntry"}, {"role": "user", "content": "which table stores customer's orders"},
{"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, Inv
oiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, Billing
PostalCode, Total\nFROM invoices"}, {"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   w
here albums and artists are linked by ArtistId, albums and tracks are linked
by AlbumId,\n   "}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:27:53.459
472353Z', 'message': {'role': 'assistant', 'content': ' SELECT a.ArtistId,
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\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, 'done_
reason': 'stop', 'done': True, 'total_duration': 44966048070, 'load_duratio
n': 8993834, 'prompt_eval_count': 1444, 'prompt_eval_duration': 37297194000,
'eval_count': 76, 'eval_duration': 6247885000}

[(LLM Response)]

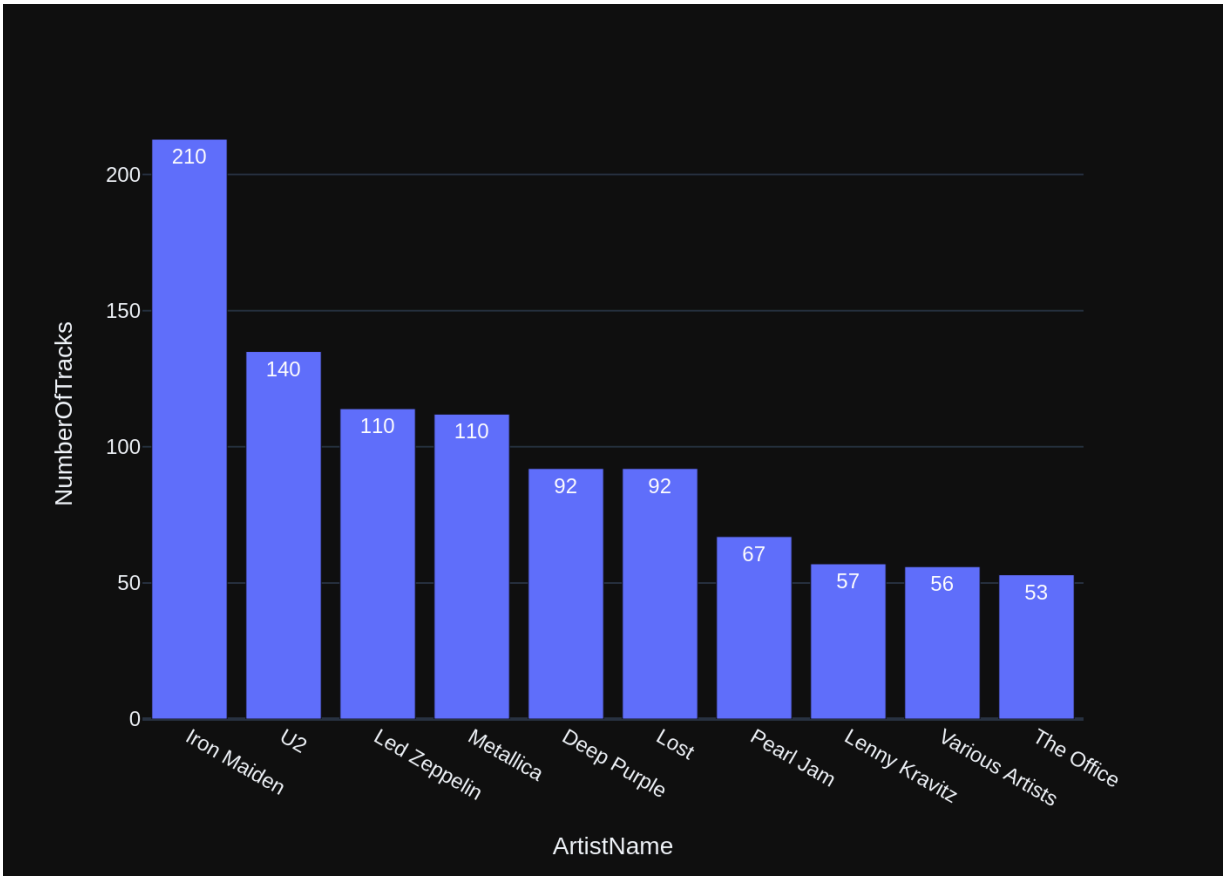
```
 SELECT a.ArtistId, a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks
FROM artists a
JOIN albums al ON a.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
GROUP BY a.ArtistId
ORDER BY NumberOfTracks DESC
LIMIT 10
```

```
SELECT a.ArtistId, 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
ORDER BY NumberOfTracks DESC
LIMIT 10
```

	ArtistId	ArtistName	NumberOfTracks
0	90	Iron Maiden	213
1	150	U2	135
2	22	Led Zeppelin	114
3	50	Metallica	112
4	58	Deep Purple	92
5	149	Lost	92
6	118	Pearl Jam	67
7	100	Lenny Kravitz	57
8	21	Various Artists	56
9	156	The Office	53


```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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        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 query:  SELECT
a.ArtistId, a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTracks\nFROM a
rtists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t ON al.Al
bumId = t.AlbumId\nGROUP BY a.ArtistId\nORDER BY NumberOfTracks DESC\nLIMIT
10\n\nThe following is information about the resulting pandas DataFrame 'd
f': \nRunning df.dtypes gives:\n ArtistId           int64\nArtistName
object\nNumberOfTracks     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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:28:06.364
632778Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\nimport pandas as pd\n\n# Check if the DataFrame has more
than one row\nif len(df) > 1:\n    fig = px.bar(df, x=\'ArtistName\', y=\'Nu
mberOfTracks\', text_auto=\'.2s\')\nelse:\n    fig = px.scatter(df, x=\'Arti
stName\', y=\'NumberOfTracks\', trendline="ols")\n\nfig.show()\n```'}, 'done
_reason': 'stop', 'done': True, 'total_duration': 12874426231, 'load_duratio
n': 7435794, 'prompt_eval_count': 285, 'prompt_eval_duration': 5744670000,
'eval_count': 102, 'eval_duration': 6995642000}
```

```
import plotly.express as px
import pandas as pd

# Check if the DataFrame has more than one row
if len(df) > 1:
    fig = px.bar(df, x='ArtistName', y='NumberOfTracks', text_auto='.2s')
else:
    fig = px.scatter(df, x='ArtistName', y='NumberOfTracks', trendline="ols")
```




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

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


[( 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    Address
NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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    Sup
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 "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(40),\r
\n    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    EmployeeI
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
ETIME,\r\n    Address NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State N
VARCHAR(40),\r\n    Country NVARCHAR(40),\r\n    PostalCode NVARCHAR(10),\r
\n    Phone NVARCHAR(24),\r\n    Fax NVARCHAR(24),\r\n    Email NVARCHAR(6
0),\r\n    FOREIGN KEY (ReportsTo) REFERENCES "employees" (EmployeeId) \r\n
\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\n\nCREATE TABLE "invoice_it
ems"\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
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
PlaylistId INTEGER  NOT NULL,\r\n    TrackId INTEGER  NOT NULL,\r\n    CONST
RAINT PK_PlaylistTrack PRIMARY KEY  (PlaylistId, TrackId),\r\n    FOREIGN KE
Y (PlaylistId) REFERENCES "playlists" (PlaylistId) \r\n\t\tON 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
\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    FOREIGN K
EY (ArtistId) REFERENCES "artists" (ArtistId) \r\n\t\tON DELETE NO ACTION ON
UPDATE NO ACTION\r\n)\n\n\n===Additional Context \n\n\n    In the \'customer
s\' table, address column names do not have \'Billing\' prefix, \n    e.g. c
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': "\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\n
GROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5 results in the
following exception [ERROR-DB] Failed to execute SQL: SELECT BillingCountr
y, 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\nOR
DER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n
Please fix the error and re-generate the SQL\n "}, {'role': 'assistan
t', 'content': 'SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\n
FROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5'},
{'role': 'user', 'content': "which table stores customer's orders"}, {'rol
e': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceD
ate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPosta
lCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'How many custome
rs are there'}, {'role': 'assistant', 'content': 'SELECT COUNT(*) AS NumberO
fCustomers FROM customers'}, {'role': 'user', 'content': 'Get the total numb
er of invoices for each customer'}, {'role': 'assistant', 'content': ' SELEC
T CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerI
d'}, {'role': 'user', 'content': 'Find the total number of invoices per coun
try'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS
TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'c
ontent': "List all employees and their reporting manager's name (if any):"},
{'role': 'assistant', 'content': 'SELECT e.FirstName, e.LastName, m.FirstNam
e AS ManagerFirstName, m.LastName AS ManagerLastName\nFROM employees e\nLEFT
JOIN employees m ON e.ReportsTo = m.EmployeeId'}, {'role': 'user', 'conten
t': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role':
'assistant', 'content': "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nF
ROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'conten
t': ' Get the average invoice total for each customer:'}, {'role': 'assistan
t', 'content': ' SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM
invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'List all invoi
ces with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT
* FROM invoices WHERE Total > 10'}, {'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': 'user',
'content': 'List all customers from Canada and their email addresses:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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
\n   LastName NVARCHAR(20) NOT NULL,\r\n   Company NVARCHAR(80),\r\n   A
ddress NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State 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 \"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
R(40),\r\n   BillingState NVARCHAR(40),\r\n   BillingCountry NVARCHAR(4
0),\r\n   BillingPostalCode NVARCHAR(10),\r\n   Total NUMERIC(10,2) NOT N
ULL,\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_Inv
oiceCustomerId ON \"invoices\" (CustomerId)\n\nCREATE TABLE \"employees\"\r
\n(\r\n   EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Las
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
HireDate DATETIME,\r\n   Address NVARCHAR(70),\r\n   City NVARCHAR(40),\r
\n   State NVARCHAR(40),\r\n   Country NVARCHAR(40),\r\n   PostalCode NVA
RCHAR(10),\r\n   Phone NVARCHAR(24),\r\n   Fax NVARCHAR(24),\r\n   Email
NVARCHAR(60),\r\n   FOREIGN KEY (ReportsTo) REFERENCES \"employees\" (Emplo
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
NOT NULL,\r\n   CONSTRAINT PK_PlaylistTrack PRIMARY KEY (PlaylistId, Track
Id),\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 INDEX IFK_EmployeeReportsTo ON \"employees\" (ReportsT
o)\n\nCREATE TABLE \"albums\"\r\n(\r\n   AlbumId INTEGER PRIMARY KEY AUTOIN
CREMENT NOT NULL,\r\n   Title NVARCHAR(160) NOT NULL,\r\n   ArtistId INTE
GER 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\n\n===Additional C
ontext \n\n\n   In the 'customers' table, address column names do not have
'Billing' prefix, \n   e.g. country column name is 'country', not 'BillingC
ountry'\n   \n\nIn the chinook database invoice means order\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   F
or the question what are the top 5 countries that customers come from?, \n
the generated SQL statement SELECT BillingCountry, COUNT(*) AS CustomerCoun

t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}, {"role": "assistant", "content": "SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5"}, {"role": "user", "content": "which table stores custome
r's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, C
ustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCo
untry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "conten
t": "How many customers are there"}, {"role": "assistant", "content": "SELEC
T COUNT(*) AS NumberOfCustomers FROM customers"}, {"role": "user", "conten
t": "Get the total number of invoices for each customer"}, {"role": "assista
nt", "content": " SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoice
s\nGROUP BY CustomerId"}, {"role": "user", "content": "Find the total number
of invoices per country"}, {"role": "assistant", "content": " SELECT Billing
Country, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountr
y"}, {"role": "user", "content": "List all employees and their reporting man
ager's name (if any):"}, {"role": "assistant", "content": "SELECT e.FirstNam
e, e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastNam
e\nFROM employees e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId"},
{"role": "user", "content": "Find all invoices since 2010 and the total amou
nt invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, Customer
Id, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"},
{"role": "user", "content": " Get the average invoice total for each custome
r:"}, {"role": "assistant", "content": " SELECT CustomerId, AVG(Total) AS Av
erageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "c
ontent": "List all invoices with a total exceeding $10"}, {"role": "assistan
t", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user",
"content": "Can you list all tables in the SQLite database catalog?"}, {"rol
e": "assistant", "content": "SELECT name FROM sqlite_master WHERE type='tabl
e'"}, {"role": "user", "content": "List all customers from Canada and their
email addresses:"}]

[(Ollama Response)]

{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:28:57.198
853265Z', 'message': {'role': 'assistant', 'content': " SELECT Email, Countr
y\nFROM customers\nWHERE Country = 'Canada'"}, 'done_reason': 'stop', 'don
e': True, 'total_duration': 50727000750, 'load_duration': 8669878, 'prompt_e
val_count': 1716, 'prompt_eval_duration': 48054060000, 'eval_count': 15, 'ev
al_duration': 1200834000}

[(LLM Response)]

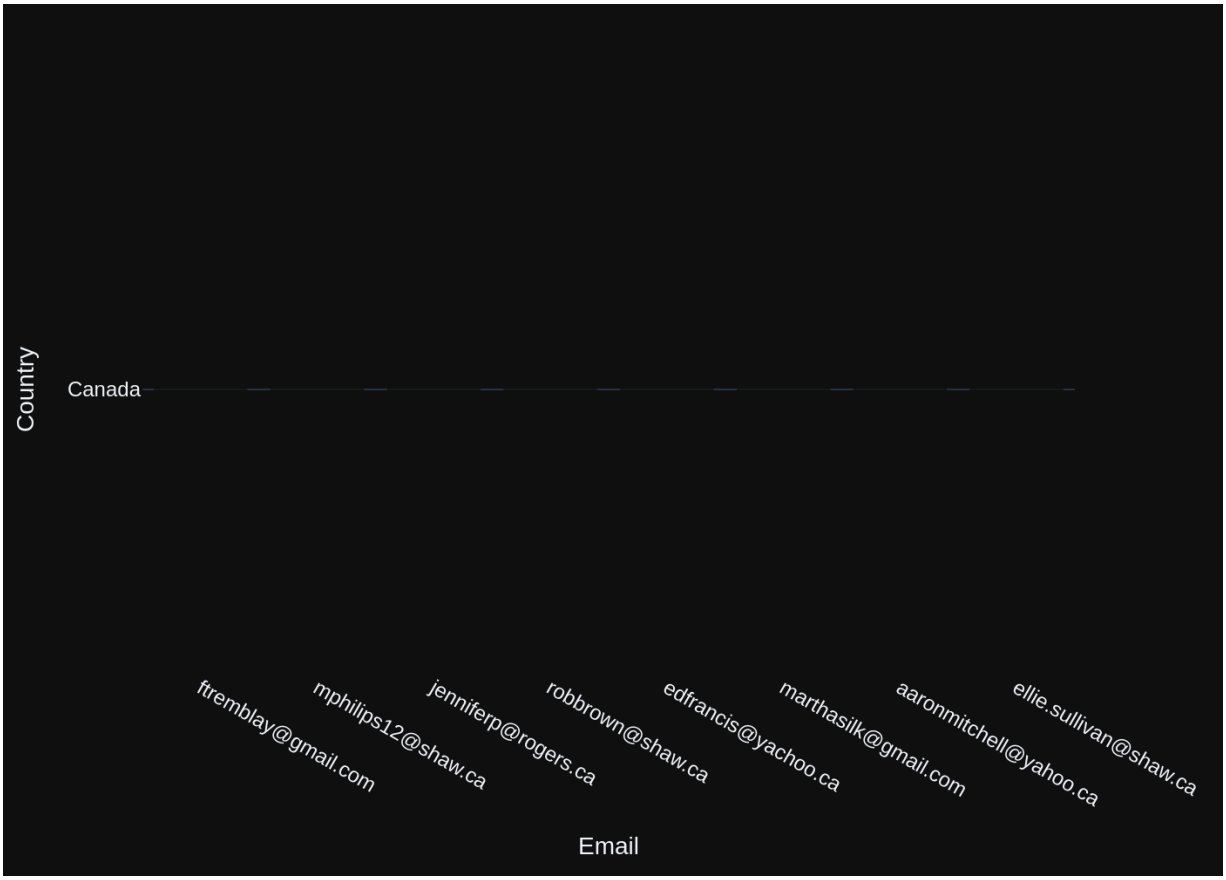
```
 SELECT Email, Country
FROM customers
WHERE Country = 'Canada'
```

```sql
SELECT Email, Country
FROM customers
WHERE Country = 'Canada'
```

	Email	Country
0	ftremblay@gmail.com	Canada
1	mphilips12@shaw.ca	Canada
2	jenniferp@rogers.ca	Canada
3	robbrown@shaw.ca	Canada
4	edfrancis@yachoo.ca	Canada
5	marthasilk@gmail.com	Canada
6	aaronmitchell@yahoo.ca	Canada
7	ellie.sullivan@shaw.ca	Canada

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 Email, Country\nFROM customers\nWHERE C
ountry = 'Canada'\n\nThe following is information about the resulting pandas
DataFrame 'df': \nRunning df.dtypes gives:\n Email      object\nCountry    o
bject\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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:29:06.026
544615Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\n\nif df[\'Email\'].nunique() == 1:\n    fig = px.indicat
or(value=len(df), title="Number of Customers from Canada")\nelse:\n    fig =
px.bar(df, x=\'Email\', y=\'Country\', text_auto=\'.2s\')\n\nfig.show()\n``
`'}, 'done_reason': 'stop', 'done': True, 'total_duration': 8784058196, 'loa
d_duration': 8195588, 'prompt_eval_count': 161, 'prompt_eval_duration': 3096
860000, 'eval_count': 84, 'eval_duration': 5552188000}
```

```python
import plotly.express as px

if df['Email'].nunique() == 1:
    fig = px.indicator(value=len(df), title="Number of Customers from Canada")
else:
    fig = px.bar(df, x='Email', y='Country', text_auto='.2s')
```




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

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


[( 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    B
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_I
nvoiceLineInvoiceId ON "invoice_items" (InvoiceId)\n\nCREATE TABLE "invoice_
items"\r\n(\r\n    InvoiceLineId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\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 "c
ustomers"\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    Cit
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
4),\r\n    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    E
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    HireDa
te DATETIME,\r\n    Address NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    S
tate NVARCHAR(40),\r\n    Country NVARCHAR(40),\r\n    PostalCode NVARCHAR(1
0),\r\n    Phone NVARCHAR(24),\r\n    Fax NVARCHAR(24),\r\n    Email NVARCHA
R(60),\r\n    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
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
OT NULL,\r\n    FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t
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\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': ' SE
LECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY Customer
Id'}, {'role': 'user', 'content': 'List all invoices with a total exceeding
$10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total
> 10'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the to
tal amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId,
CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01
-01'"}, {'role': 'user', 'content': "which table stores customer's orders"},
{'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, Inv
oiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, Billing
PostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': ' Get the av
erage invoice total for each customer:'}, {'role': 'assistant', 'content': '
SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP B
Y CustomerId'}, {'role': 'user', 'content': 'Find the total number of invoic
es per country'}, {'role': 'assistant', 'content': ' SELECT BillingCountry,
COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'rol
e': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit
price):'}, {'role': 'assistant', 'content': ' SELECT Name, UnitPrice\nFROM t
racks\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'role': 'user', 'content': 'How
many customers are there'}, {'role': 'assistant', 'content': 'SELECT COUNT
(*) AS NumberOfCustomers 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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n   Please fix the error and re-generate the SQL\n
"}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5'}, {'role': 'user', 'content': "List all employees and thei
r reporting manager's name (if any):"}, {'role': 'assistant', 'content': 'SE
LECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS
ManagerLastName\nFROM employees e\nLEFT JOIN employees m ON e.ReportsTo = m.
EmployeeId'}, {'role': 'user', 'content': 'Find the customer with the most i
nvoices '}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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 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(40),\r\n   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 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 \"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   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 ACTION\r\n)\n\nCREATE INDEX IFK_InvoiceLineTrackId ON \"invoice_items\" (TrackId)\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\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   Fax NVARCHAR(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId INTEGER,\r\n   FOREIGN KEY (SupportRepId) REFERENCES \"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 \"employees\"\r\n(\r\n   EmployeeId INTEGER PRIMARY KEY AUTOINCREMENT NOT 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   BirthDate 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\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 INDEX IFK_EmployeeReportsTo ON \"employees\" (ReportsTo)\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 INTEGER,\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 UPDATE 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 (MediaTypeId) REFERENCES \"media_types\" (MediaTypeId) \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\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 provided context is 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 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 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 CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "List all invoices with a total exceeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "which table stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": " Get the average invoice total for each customer:"}, {"role": "assistant", "content": " SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "content": " SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"role": "user", "content": "How many customers are there"}, {"role": "assistant", "content": "SELECT COUNT(*) AS NumberOfCustomers 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\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 BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n   Please fix the error and re-generate the SQL\n   "}, {"role": "assistant", "content": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "user", "content": "List all employees and their reporting manager's name (if any):"}, {"role": "assistant", "content": "SELECT e.FirstName, e.LastName, m.FirstName AS ManagerFirstName, m.LastName AS ManagerLastName\nFROM employees e\nLEFT JOIN employees m ON e.ReportsTo = m.EmployeeId"}, {"role": "user", "content": "Find the customer with the most invoices "}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:30:02.931710808Z', 'message': {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1'}, 'done_reason': 'stop', 'done': True, 'total_duration': 56804189030, 'load_duration': 7710886, 'prompt_eval_count': 1761, 'prompt_eval_duration': 49857228000, 'eval_count': 64, 'eval_duration': 5449401000}

[(LLM Response)]

```
 SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.CustomerId
```

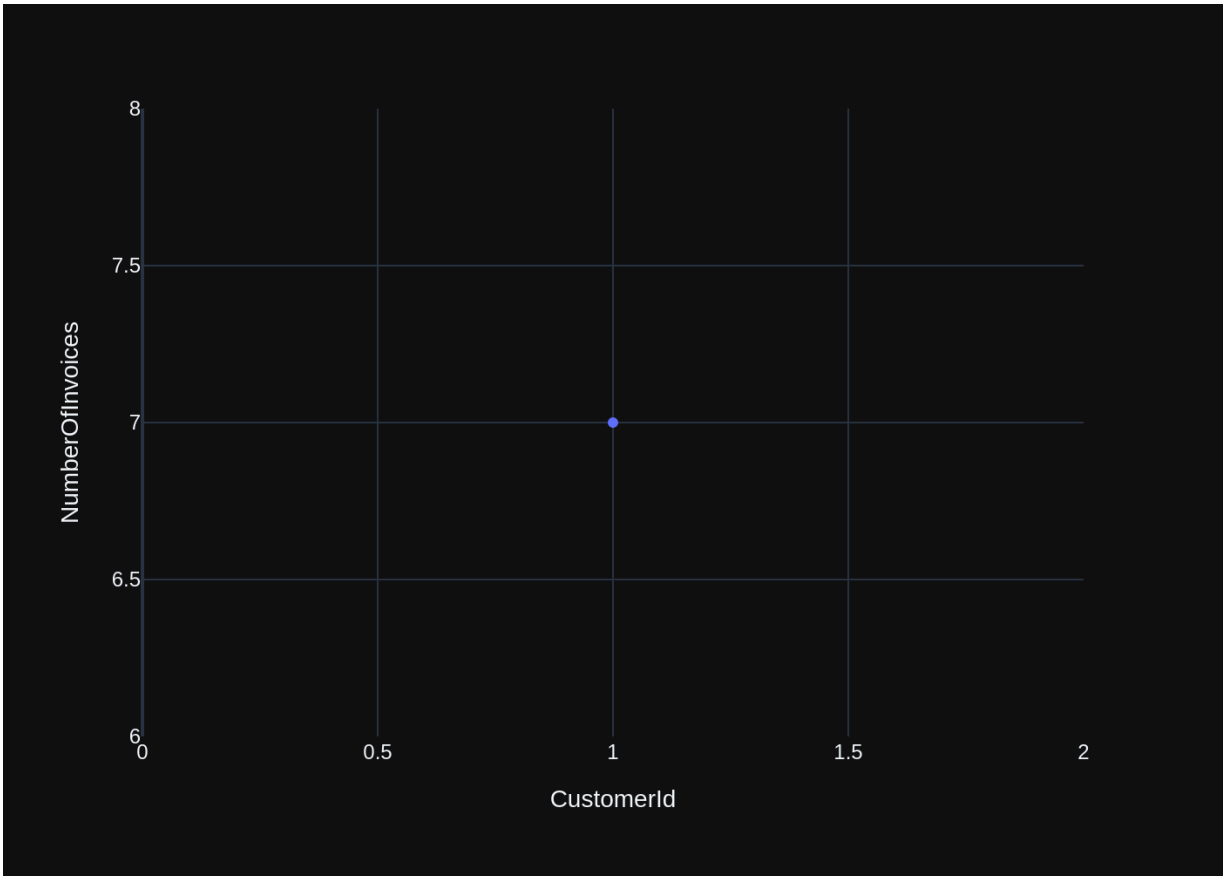
```
ORDER BY NumberOfInvoices DESC
LIMIT 1
```

```
SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
GROUP BY c.CustomerId
ORDER BY NumberOfInvoices DESC
LIMIT 1
```

	CustomerId	FirstName	LastName	NumberOfInvoices
0	1	Luís	Gonçalves	7

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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.InvoiceI
d) AS NumberOfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId =
i.CustomerId\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1
\n\nThe following is information about the resulting pandas DataFrame 'df':
\nRunning df.dtypes gives:\n CustomerId           int64\nFirstName
object\nLastName            object\nNumberOfInvoices     int64\ndtype: objec
t"}, {"role": "user", "content": "Can you generate 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 with any explanations -- just t
he code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:30:18.083
883604Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\n\nif len(df) == 1:\n    fig = px.indicator(\n        tit
le="Number of Invoices",\n        value=df[\'NumberOfInvoices\'].iloc[0],\n
gauge={\'axis\': {\'visible\': False}},\n        template=\'plotly_dark\'\n
)\nelse:\n    fig = px.bar(df, x=\'CustomerId\', y=\'NumberOfInvoices\', tex
t=\'NumberOfInvoices\')\n    fig.update_traces(texttemplate=\'%{text}\', tex
tposition=\'outside\')\n    fig.update_layout(title=\'Number of Invoices by
Customer\')\n\nfig.show()\n```'}, 'done_reason': 'stop', 'done': True, 'tota
l_duration': 15124318181, 'load_duration': 8031258, 'prompt_eval_count': 22
3, 'prompt_eval_duration': 4472039000, 'eval_count': 152, 'eval_duration': 1
0516422000}
```

```
import plotly.express as px

if len(df) == 1:
    fig = px.indicator(
        title="Number of Invoices",
        value=df['NumberOfInvoices'].iloc[0],
        gauge={'axis': {'visible': False}},
        template='plotly_dark'
    )
else:
    fig = px.bar(df, x='CustomerId', y='NumberOfInvoices', text='NumberOfInvoices')
    fig.update_traces(texttemplate='%{text}', textposition='outside')
    fig.update_layout(title='Number of Invoices by Customer')
```




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

```
================================================================================
====
# QUESTION - 21:  Find the customer who bought the most albums in total quan
tity (across all invoices):
================================================================================
====


[( 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    Albu
mId INTEGER,\r\n    MediaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\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 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 "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
N,\r\n    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
0),\r\n    BillingState NVARCHAR(40),\r\n    BillingCountry NVARCHAR(40),\r
\n    BillingPostalCode NVARCHAR(10),\r\n    Total NUMERIC(10,2)  NOT NUL
L,\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_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\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    e.g. c
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': ' SELEC
T c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoi
ces\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP
BY c.CustomerId\nORDER BY NumberOfInvoices 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 - artists, albums an
d tracks, \n   where albums and artists are linked by ArtistId, albums
and tracks are linked by AlbumId,\n   '}, {'role': 'assistant', 'content':
' SELECT a.ArtistId, a.Name AS ArtistName, COUNT(t.TrackId) AS NumberOfTrack
s\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistId\nJOIN tracks t
ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId\nORDER BY NumberOfTracks DESC
\nLIMIT 10'}, {'role': 'user', 'content': 'List all invoices with a total ex
ceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHE
RE Total > 10'}, {'role': 'user', 'content': 'Get the total number of invoic
es for each customer'}, {'role': 'assistant', 'content': ' SELECT CustomerI
d, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role':
'user', 'content': 'Find all invoices since 2010 and the total amount invoic
ed:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, Invoi
ceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role':
'user', 'content': 'Find the top 5 most expensive tracks (based on unit pric
e):'}, {'role': 'assistant', 'content': ' SELECT Name, UnitPrice\nFROM track
s\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Find the
total number of invoices per country'}, {'role': 'assistant', 'content': ' S
ELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY Bil
lingCountry'}, {'role': 'user', 'content': ' Get the average invoice total f
or each customer:'}, {'role': 'assistant', 'content': ' SELECT CustomerId, A
VG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId'}, {'ro
le': 'user', 'content': "which table stores customer's orders"}, {'role': 'a
ssistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, B
illingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode,
Total\nFROM invoices'}, {'role': 'user', 'content': 'List all albums and the
ir 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 the custome
r who bought the most albums in total quantity (across all invoices):'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   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 (MediaTy
peId) REFERENCES \"media_types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O
N UPDATE NO ACTION\r\n)\n\nCREATE TABLE \"invoice_items\"\r\n(\r\n   Invoic
eLineId INTEGER 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   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 ACTION\r\n)\n\nCREATE TABLE \"albums\"\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   FOREIGN K
EY (ArtistId) REFERENCES \"artists\" (ArtistId) \r\n\t\tON 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
EY AUTOINCREMENT NOT NULL,\r\n   CustomerId INTEGER NOT NULL,\r\n   Invoi
ceDate DATETIME NOT NULL,\r\n   BillingAddress NVARCHAR(70),\r\n   Billin
gCity NVARCHAR(40),\r\n   BillingState NVARCHAR(40),\r\n   BillingCountry
NVARCHAR(40),\r\n   BillingPostalCode NVARCHAR(10),\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 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   ArtistId
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
\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 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) A
S NumberOfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cu
stomerId\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices 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.ArtistId, a.Name AS ArtistName, COUNT(t.TrackId)
AS NumberOfTracks\nFROM artists a\nJOIN albums al ON a.ArtistId = al.ArtistI
d\nJOIN tracks t ON al.AlbumId = t.AlbumId\nGROUP BY a.ArtistId\nORDER BY Nu
mberOfTracks DESC\nLIMIT 10"}, {"role": "user", "content": "List all invoice
s with a total exceeding $10"}, {"role": "assistant", "content": " SELECT *
FROM invoices WHERE Total > 10"}, {"role": "user", "content": "Get the total
number of invoices for each customer"}, {"role": "assistant", "content": " S
ELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY Custome
rId"}, {"role": "user", "content": "Find all invoices since 2010 and the tot
al amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, C
ustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-
01'"}, {"role": "user", "content": "Find the top 5 most expensive tracks (ba
sed on unit price):"}, {"role": "assistant", "content": " SELECT Name, UnitP
rice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"role": "user", "con
tent": "Find the total number of invoices per country"}, {"role": "assistan

t", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content": " Get the average invoice total for each customer:"}, {"role": "assistant", "content": " SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "which table stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"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.ArtistId"}, {"role": "user", "content": "Find the customer who bought the most albums in total quantity (across all invoices):"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:31:07.054245438Z', 'message': {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 1'}, 'done_reason': 'stop', 'done': True, 'total_duration': 48882717647, 'load_duration': 8382774, 'prompt_eval_count': 1517, 'prompt_eval_duration': 40995979000, 'eval_count': 78, 'eval_duration': 6459612000}

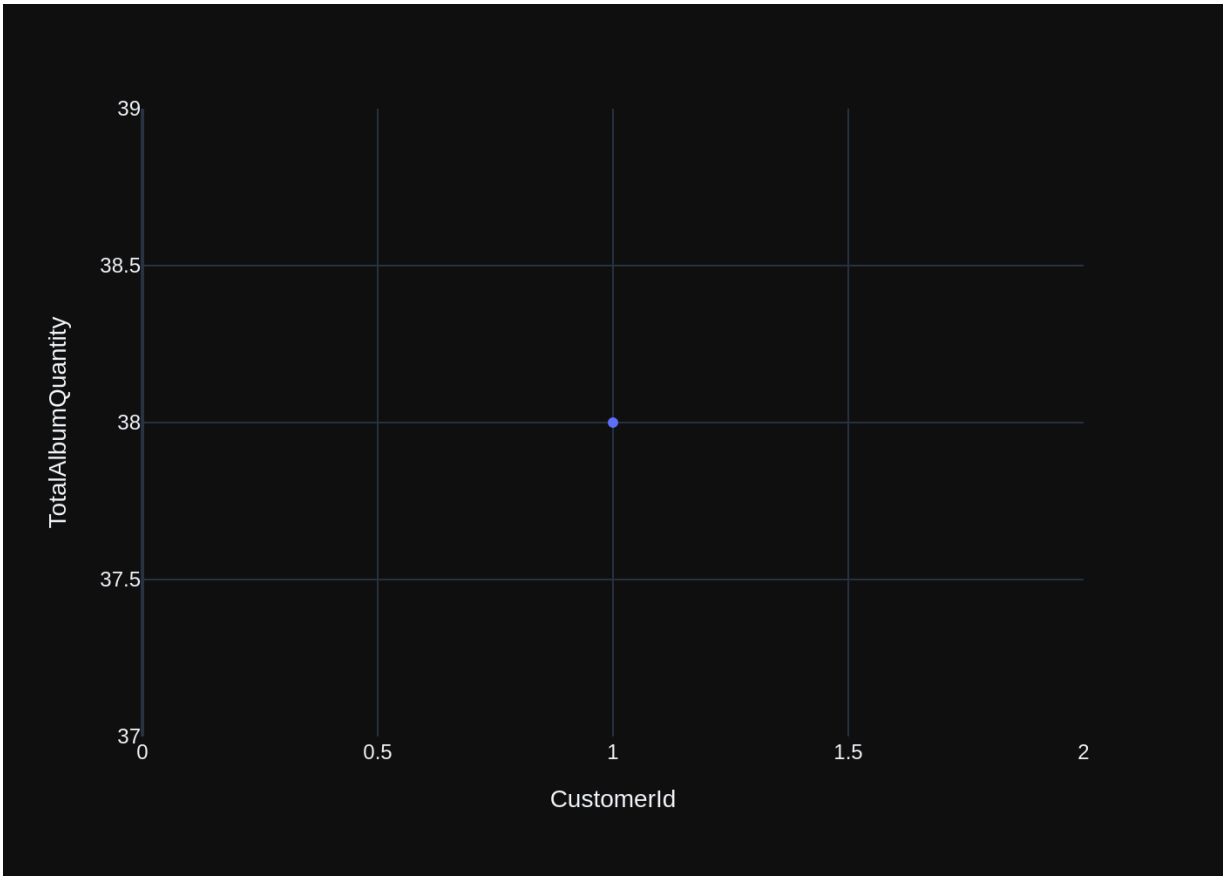
[(LLM Response)]
  SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId
GROUP BY c.CustomerId
ORDER BY TotalAlbumQuantity DESC
LIMIT 1

```
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId
GROUP BY c.CustomerId
ORDER BY TotalAlbumQuantity DESC
LIMIT 1
```

	CustomerId	FirstName	LastName	TotalAlbumQuantity
0	1	Luís	Gonçalves	38

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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 query:   SELECT c.Customer
Id, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM cu
stomers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_item
s ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlb
umQuantity DESC\nLIMIT 1\n\nThe following is information about the resulting
pandas DataFrame 'df': \nRunning df.dtypes gives:\n CustomerId             i
nt64\nFirstName             object\nLastName              object\nTotalAlbum
Quantity     int64\ndtype: object"}, {"role": "user", "content": "Can you ge
nerate 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 answe
r with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:31:22.586
705185Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\nimport pandas as pd\n\n# Check if the DataFrame has more
than one row\nif len(df) > 1:\n    fig = px.bar(df, x=\'CustomerId\', y=\'To
talAlbumQuantity\', text=\'TotalAlbumQuantity\')\nelse:\n    fig = px.indica
tor(title="Top Customer by Total Album Quantity", value=df[\'TotalAlbumQuant
ity\'].iloc[0], domain={\'y\': [0, 1]})\n\nfig.update_layout(title=\'Custome
r with the Most Albums Purchased\', xaxis_title=\'Customer ID\', yaxis_title
=\'Total Album Quantity\')\nfig.show()\n```'}, 'done_reason': 'stop', 'don
e': True, 'total_duration': 15484701863, 'load_duration': 8312835, 'prompt_e
val_count': 245, 'prompt_eval_duration': 4926926000, 'eval_count': 152, 'eva
l_duration': 10420736000}
```

```python
import plotly.express as px
import pandas as pd

# Check if the DataFrame has more than one row
if len(df) > 1:
    fig = px.bar(df, x='CustomerId', y='TotalAlbumQuantity', text='TotalAlbumQuantity')
else:
    fig = px.indicator(title="Top Customer by Total Album Quantity", value=df['TotalAlbumQuantity'].iloc[0], domain={'y': [0, 1]})

fig.update_layout(title='Customer with the Most Albums Purchased', xaxis_title='Customer ID', yaxis_title='Total Album Quantity')
```




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

```
================================================================================
====
# QUESTION - 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,

================================================================================
====


[( 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
L,\r\n    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
N,\r\n    FOREIGN KEY (TrackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DEL
ETE 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
OT NULL,\r\n    FOREIGN KEY (AlbumId) REFERENCES "albums" (AlbumId) \r\n\t\t
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    InvoiceD
ate DATETIME  NOT NULL,\r\n    BillingAddress NVARCHAR(70),\r\n    BillingCi
ty NVARCHAR(40),\r\n    BillingState NVARCHAR(40),\r\n    BillingCountry NVA
RCHAR(40),\r\n    BillingPostalCode NVARCHAR(10),\r\n    Total NUMERIC(10,2)
NOT NULL,\r\n    FOREIGN KEY (CustomerId) REFERENCES "customers" (CustomerI
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\nCREATE IN
DEX IFK_TrackAlbumId ON "tracks" (AlbumId)\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 exactly as it was given before. \n'}, {'role': 'user', 'content': 'Find the customer who bought the most albums in total quantity (across all invoices):'}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity 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 - artists, albums and tracks, \n   where albums and artists are linked by ArtistId, albums and tracks are linked by AlbumId,\n   '}, {'role': 'assistant', 'content': ' SELECT a.ArtistId, 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\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, {'role': 'user', 'content': 'Find the customer with the most invoices '}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1'}, {'role': 'user', 'content': 'List all invoices with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': 'Find the top 5 most expensive tracks (based on unit price):'}, {'role': 'assistant', 'content': ' SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'content': ' SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find the total number of invoices per country'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'content': 'Find all invoices since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}, {'role': 'assistant', 'content': ' SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': "which table stores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': '   \n   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=deepseek-coder-v2:latest,
options={},
keep_alive=None

[(Prompt Content)]
[{"role": "system", "content": "You are a SQLite expert. Please help to generate 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 \"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   UnitPrice NUMERIC(10,2) NOT NULL,\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
N,\r\n   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
OT 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) REFE
RENCES \"genres\" (GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO
N,\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 \"album
s\"\r\n(\r\n   AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   T
itle NVARCHAR(160) NOT NULL,\r\n   ArtistId INTEGER NOT NULL,\r\n   FORE
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   Invoi
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
0),\r\n   Total NUMERIC(10,2) NOT NULL,\r\n   FOREIGN KEY (CustomerId) RE
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
tists\"\r\n(\r\n   ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n
Name NVARCHAR(120)\r\n)\n\nCREATE INDEX IFK_TrackAlbumId ON \"tracks\" (Albu
mId)\n\n\n===Additional Context \n\nIn the chinook database invoice means or
der\n\n\n   In the 'customers' table, address column names do not have 'Bil
ling' prefix, \n   e.g. country column name is 'country', not 'BillingCount
ry'\n   \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.Cu
stomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nF
ROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoic
e_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY To
talAlbumQuantity DESC\nLIMIT 1"}, {"role": "user", "content": " \n   Ca
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   where album
s and artists are linked by ArtistId, albums and tracks are linked by AlbumI
d,\n   "}, {"role": "assistant", "content": " SELECT a.ArtistId, 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\nGRO
UP BY a.ArtistId\nORDER BY NumberOfTracks DESC\nLIMIT 10"}, {"role": "user",
"content": "Find the customer with the most invoices "}, {"role": "assistan
t", "content": " SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.Invoi
ceId) AS NumberOfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId

= i.CustomerId\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1"}, {"role": "user", "content": "List all invoices with a total exceeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "content": " SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"role": "user", "content": "Get the total number of invoices for each customer"}, {"role": "assistant", "content": " SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find the total number of invoices per country"}, {"role": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": " Get the average invoice total for each customer:"}, {"role": "assistant", "content": " SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "which table stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "user", "content": "   \n   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 Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:32:14.532903115Z', 'message': {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5'}, 'done_reason': 'stop', 'done': True, 'total_duration': 51816123312, 'load_duration': 6911213, 'prompt_eval_count': 1591, 'prompt_eval_duration': 43901734000, 'eval_count': 78, 'eval_duration': 6498796000}

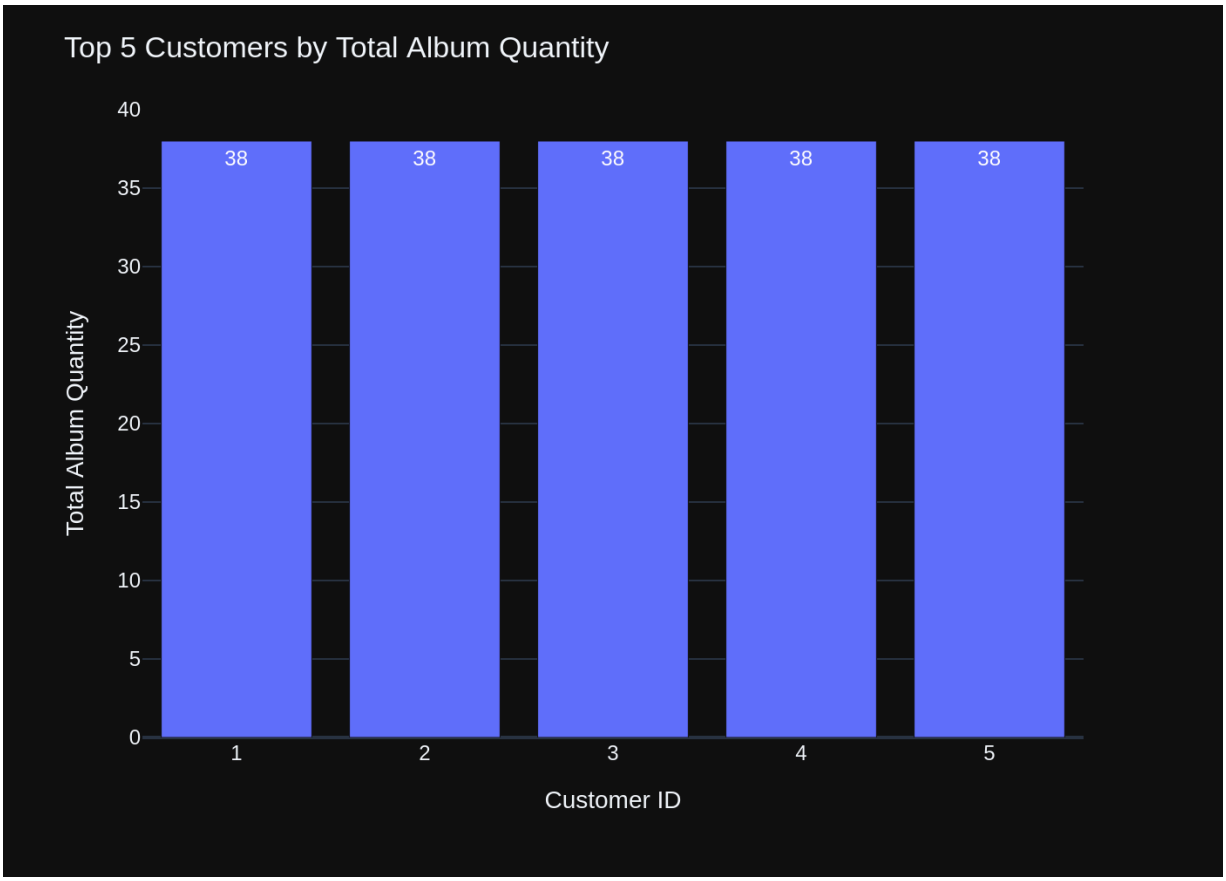
[(LLM Response)]
  SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId
GROUP BY c.CustomerId
ORDER BY TotalAlbumQuantity DESC
LIMIT 5

```sql
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity
FROM customers c
JOIN invoices i ON c.CustomerId = i.CustomerId
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId
GROUP BY c.CustomerId
ORDER BY TotalAlbumQuantity DESC
LIMIT 5
```

	CustomerId	FirstName	LastName	TotalAlbumQuantity
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=deepseek-coder-v2:latest,
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 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.C
ustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\n
FROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoi
ce_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY T
otalAlbumQuantity DESC\nLIMIT 5\n\nThe following is information about the re
sulting pandas DataFrame 'df': \nRunning df.dtypes gives:\n CustomerId
int64\nFirstName             object\nLastName              object\nTotalAlbu
mQuantity     int64\ndtype: object"}, {"role": "user", "content": "Can you g
enerate 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 answe
r with any explanations -- just the code."}]

[( Ollama Response )]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:32:30.409
606795Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.express as px\nimport numpy as np\n\nif len(df) == 1:\n    fig = px.ind
icator(title="Top Customers by Total Album Quantity", value=df[\'TotalAlbumQ
uantity\'].values[0], domain={"x": [0, 1], "y": [0, 1]})\nelse:\n    fig = p
x.bar(df, x=\'CustomerId\', y=\'TotalAlbumQuantity\', text_auto=\'.2s\')\n\n
fig.update_layout(title="Top 5 Customers by Total Album Quantity", xaxis_tit
le="Customer ID", yaxis_title="Total Album Quantity")\nfig.show()\n```'}, 'd
one_reason': 'stop', 'done': True, 'total_duration': 15843441681, 'load_dura
tion': 8248291, 'prompt_eval_count': 267, 'prompt_eval_duration': 530754900
0, 'eval_count': 151, 'eval_duration': 10400860000}
```

```
import plotly.express as px
import numpy as np

if len(df) == 1:
    fig = px.indicator(title="Top Customers by Total Album Quantity", value=df['TotalAlbumQuantity'].values[0], domain={"x": [0, 1], "y": [0, 1]})
else:
    fig = px.bar(df, x='CustomerId', y='TotalAlbumQuantity', text_auto='.2s')

fig.update_layout(title="Top 5 Customers by Total Album Quantity", xaxis_title="Customer ID", yaxis_title="Total Album Quantity")
```




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

```
================================================================================
====
# QUESTION - 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

================================================================================
====


[( 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    B
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 "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 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
LE "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\n    C
ity 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 NVARCHA
R(24),\r\n    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
HAR(20)  NOT NULL,\r\n    FirstName NVARCHAR(20)  NOT NULL,\r\n    Title NVA
RCHAR(30),\r\n    ReportsTo INTEGER,\r\n    BirthDate DATETIME,\r\n    HireD
ate DATETIME,\r\n    Address NVARCHAR(70),\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    Fax NVARCHAR(24),\r\n    Email NVARC
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 "track
s"\r\n(\r\n    TrackId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n    Na
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" (AlbumI
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
ACTION,\r\n    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
ER NOT NULL,\r\n   CONSTRAINT PK_PlaylistTrack PRIMARY KEY (PlaylistId, T
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
\n\n   In the \'customers\' table, address column names do not have \'Billi
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':
'user', 'content': '   \n   Find the top 5 customers who bought the
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 TotalAl
bumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerI
d\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerI
d\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5'}, {'role': 'user', 'content':
'Find the customer who bought the most albums in total quantity (across all
invoices):'}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.Fir
stName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c
\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON
i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuanti
ty DESC\nLIMIT 1'}, {'role': 'user', 'content': 'Find the customer with the
most invoices '}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.
FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices\nFROM customer
s c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId\n
ORDER BY NumberOfInvoices DESC\nLIMIT 1'}, {'role': 'user', 'content': ' Get
the average invoice total for each customer:'}, {'role': 'assistant', 'conte
nt': ' SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\n
GROUP BY CustomerId'}, {'role': 'user', 'content': 'Find the top 5 most expe
nsive tracks (based on unit price):'}, {'role': 'assistant', 'content': ' SE
LECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'rol
e': 'user', 'content': 'Get the total number of invoices for each custome
r'}, {'role': 'assistant', 'content': ' SELECT CustomerId, COUNT(*) AS Total
Invoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content':
'Find the total number of invoices per country'}, {'role': 'assistant', 'con
tent': ' SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGR
OUP BY BillingCountry'}, {'role': 'user', 'content': 'List all invoices with
a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM in
voices WHERE Total > 10'}, {'role': 'user', 'content': 'Find all invoices si
nce 2010 and the total amount invoiced:'}, {'role': 'assistant', 'content':
"SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE Invo
iceDate >= '2010-01-01'"}, {'role': 'user', 'content': "\n   For the qu
estion what are the top 5 countries that customers come from?, \n   the
generated SQL statement SELECT BillingCountry, COUNT(*) AS CustomerCount\nF
ROM 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 CustomerCount\nFROM customers\nGROUP BY BillingC

ountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql ' SEL
ECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bill
ingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCo
untry .\n   Please fix the error and re-generate the SQL\n   "},
{'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT(*)
AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount D
ESC\nLIMIT 5'}, {'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=deepseek-coder-v2:latest,
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   B
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 \"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 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
EMENT NOT NULL,\r\n   FirstName NVARCHAR(40) 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
CHAR(40),\r\n   PostalCode NVARCHAR(10),\r\n   Phone NVARCHAR(24),\r\n
Fax NVARCHAR(24),\r\n   Email NVARCHAR(60) NOT NULL,\r\n   SupportRepId I
NTEGER,\r\n   FOREIGN KEY (SupportRepId) REFERENCES \"employees\" (Employee
Id) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION\r\n)\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   BirthDat
e DATETIME,\r\n   HireDate DATETIME,\r\n   Address NVARCHAR(70),\r\n   Ci
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
4),\r\n   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
R,\r\n   MediaTypeId INTEGER NOT NULL,\r\n   GenreId INTEGER,\r\n   Comp
oser NVARCHAR(220),\r\n   Milliseconds INTEGER NOT NULL,\r\n   Bytes INTE

GER,\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
ION,\r\n   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 TABLE \"playlist_track\"\r\n(\r\n   PlaylistId INTEGE
R NOT NULL,\r\n   TrackId INTEGER 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
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_EmployeeR
eportsTo ON \"employees\" (ReportsTo)\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 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,
SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON
c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.Invoi
ceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5"},
{"role": "user", "content": "Find the customer who bought the most albums in
total quantity (across all invoices):"}, {"role": "assistant", "content": "
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbum
Quantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\n
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\n
ORDER BY TotalAlbumQuantity DESC\nLIMIT 1"}, {"role": "user", "content": "Fi
nd the customer with the most invoices "}, {"role": "assistant", "content":
" SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS Number
OfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId
\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1"}, {"role":
"user", "content": " Get the average invoice total for each customer:"}, {"r
ole": "assistant", "content": " SELECT CustomerId, AVG(Total) AS AverageInvo
iceTotal\nFROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content":
"Find the top 5 most expensive tracks (based on unit price):"}, {"role": "as
sistant", "content": " SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPri
ce DESC\nLIMIT 5"}, {"role": "user", "content": "Get the total number of inv
oices for each customer"}, {"role": "assistant", "content": " SELECT Custome
rId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"rol
e": "user", "content": "Find the total number of invoices per country"}, {"r
ole": "assistant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvo
ices\nFROM invoices\nGROUP BY BillingCountry"}, {"role": "user", "content":
"List all invoices with a total exceeding $10"}, {"role": "assistant", "cont
ent": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "user", "conten
t": "Find all invoices since 2010 and the total amount invoiced:"}, {"role":
"assistant", "content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nF
ROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "conten

t": "\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\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 BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: BillingCountry .\n Please fix the error and re-generate the SQL\n "}, {"role": "assistant", "content": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "user", "content": " \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 unnecessary \n "}]

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

```
[ERROR-SQL] Failed to generate SQL for prompt:
        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
     with the following exception:
an unknown error was encountered while running the model
*** 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    B
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 "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    Address
NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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    Sup
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    Bi
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
\n    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 INDEX IFK_InvoiceLineInvoiceId ON "invoice_items" (InvoiceId)
\n\nCREATE INDEX IFK_InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE
TABLE "artists"\r\n(\r\n    ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT N
ULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n    Alb
umId 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 INDEX IFK_InvoiceLineTrackId ON "invoice_items" (TrackId)
\n\nCREATE TABLE "tracks"\r\n(\r\n    TrackId INTEGER PRIMARY KEY AUTOINCREM
ENT 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  NOT NULL,\r\n    Bytes INTEGE
R,\r\n    UnitPrice NUMERIC(10,2)  NOT NULL,\r\n    FOREIGN KEY (AlbumId) RE
FERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO
N,\r\n    FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n\t\tON DEL
```

ETE NO ACTION ON UPDATE NO ACTION,\r\n FOREIGN KEY (MediaTypeId) REFERENC
ES "media_types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTI
ON\r\n)\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 e.g. country column name is \'country\', not \'Bil
lingCountry\'\n \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
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'}, {'rol
e': 'user', 'content': ' \n Find the top 5 customers who bought
the most albums in total quantity (across all invoices):\n Hint: albu
m quantity is found in invoice_items, \n '}, {'role': 'assistant', 'conte
nt': ' SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS To
talAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust
omerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.Cust
omerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5'}, {'role': 'user', 'conte
nt': 'Find the customer who bought the most albums in total quantity (across
all invoices):'}, {'role': 'assistant', 'content': ' SELECT c.CustomerId,
c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM custom
ers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii
ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQua
ntity DESC\nLIMIT 1'}, {'role': 'user', 'content': 'Find the customer with t
he most invoices '}, {'role': 'assistant', 'content': ' SELECT c.CustomerId,
c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices\nFROM custom
ers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId
\nORDER BY NumberOfInvoices DESC\nLIMIT 1'}, {'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 CustomerCoun
t\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIM
IT 5 results in the following exception [ERROR-DB] Failed to execute SQL: S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n Execution failed on sql
' SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY
BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5': no such column: Billi
ngCountry .\n Please fix the error and re-generate the SQL\n
"}, {'role': 'assistant', 'content': 'SELECT country AS Top5Countries, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY country\nORDER BY CustomerCou
nt DESC\nLIMIT 5'}, {'role': 'user', 'content': ' Get the average invoice to
tal for each customer:'}, {'role': 'assistant', 'content': ' SELECT Customer
Id, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId'},
{'role': 'user', 'content': 'Find the total number of invoices per countr
y'}, {'role': 'assistant', 'content': ' SELECT BillingCountry, COUNT(*) AS T
otalInvoices\nFROM invoices\nGROUP BY BillingCountry'}, {'role': 'user', 'co
ntent': 'Get the total number of invoices for each customer'}, {'role': 'ass
istant', 'content': ' SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM inv
oices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find all invoices
since 2010 and the total amount invoiced:'}, {'role': 'assistant', 'conten
t': "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE
InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': 'List all invoice
s with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT *
FROM invoices WHERE Total > 10'}, {'role': 'user', 'content': "which table s

tores customer's orders"}, {'role': 'assistant', 'content': 'SELECT DISTINCT
InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingStat
e, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'use
r', 'content': '\n   For the question   \n   Find the top 5 custo
mers who spent the most money overall, \n   Hint: order total can be
found on invoices table, calculation using invoice_items detail table is unn
ecessary \n   , \n   the generated SQL statement None results in the f
ollowing exception [ERROR-SQL] 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 unnecessary \n   with the following exception: \nan unknow
n error was encountered while running the model .\n   Please fix the e
rror and re-generate the SQL\n   '}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   B
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 \"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
\n   LastName NVARCHAR(20) NOT NULL,\r\n   Company NVARCHAR(80),\r\n   A
ddress NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State 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 \"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
\n   BirthDate DATETIME,\r\n   HireDate DATETIME,\r\n   Address NVARCHAR
(70),\r\n   City 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 INDEX IFK_InvoiceLineInvoiceId ON \"invoice_items\"
(InvoiceId)\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 TABLE \"albums

\"\r\n(\r\n   AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Ti
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 ACT
ION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK_InvoiceLineTrackId ON \"inv
oice_items\" (TrackId)\n\nCREATE TABLE \"tracks\"\r\n(\r\n   TrackId INTEGE
R 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 NOT NUL
L,\r\n   Bytes INTEGER,\r\n   UnitPrice NUMERIC(10,2) NOT NULL,\r\n   FO
REIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACT
ION ON UPDATE NO ACTION,\r\n   FOREIGN KEY (GenreId) REFERENCES \"genres\"
(GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n   FOREIGN KE
Y (MediaTypeId) REFERENCES \"media_types\" (MediaTypeId) \r\n\t\tON DELETE N
O ACTION ON UPDATE NO ACTION\r\n)\n\n\n===Additional Context \n\nIn the chin
ook database invoice 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
provided context is sufficient, please generate a valid SQL query without an
y explanations for the question. \n2. If the provided context is almost suff
icient but requires knowledge of a specific string in a particular column, p
lease generate an intermediate SQL query to find the distinct strings in tha
t column. Prepend the query with a comment saying intermediate_sql \n3. If t
he provided context is insufficient, please explain why it can't be generate
d. \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": "   \n   Find the top 5 cu
stomers 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,
SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON
c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.Invoi
ceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5"},
{"role": "user", "content": "Find the customer who bought the most albums in
total quantity (across all invoices):"}, {"role": "assistant", "content": "
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbum
Quantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\n
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\n
ORDER BY TotalAlbumQuantity DESC\nLIMIT 1"}, {"role": "user", "content": "Fi
nd the customer with the most invoices "}, {"role": "assistant", "content":
" SELECT c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS Number
OfInvoices\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId
\nGROUP BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1"}, {"role":
"user", "content": "\n   For the question what are the top 5 countries
that customers come from?, \n   the generated SQL statement SELECT Bil
lingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCoun
try\nORDER BY CustomerCount DESC\nLIMIT 5 results in the following exception
[ERROR-DB] Failed to execute SQL: SELECT BillingCountry, COUNT(*) AS Custom
erCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DES
C\nLIMIT 5\n Execution failed on sql ' SELECT BillingCountry, COUNT(*) AS Cu
stomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount
DESC\nLIMIT 5': no such column: BillingCountry .\n   Please fix the err
or and re-generate the SQL\n   "}, {"role": "assistant", "content": "SE
LECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGR
OUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role": "user", "co
ntent": " Get the average invoice total for each customer:"}, {"role": "assi
stant", "content": " SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nF

ROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find the t
otal number of invoices per country"}, {"role": "assistant", "content": " SE
LECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY Bill
ingCountry"}, {"role": "user", "content": "Get the total number of invoices
for each customer"}, {"role": "assistant", "content": " SELECT CustomerId, C
OUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId"}, {"role": "us
er", "content": "Find all invoices since 2010 and the total amount invoice
d:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, Invoic
eDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role":
"user", "content": "List all invoices with a total exceeding $10"}, {"role":
"assistant", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"rol
e": "user", "content": "which table stores customer's orders"}, {"role": "as
sistant", "content": "SELECT DISTINCT InvoiceId, CustomerId, InvoiceDate, Bi
llingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode,
Total\nFROM invoices"}, {"role": "user", "content": "\n   For the quest
ion   \n   Find the top 5 customers who spent the most money overall,
\n   Hint: order total can be found on invoices table, calculation usi
ng invoice_items detail table is unnecessary \n   , \n   the generated
SQL statement None results in the following exception [ERROR-SQL] 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 t
able, calculation using invoice_items detail table is unnecessary \n   wit
h the following exception: \nan unknown error was encountered while running
the model .\n   Please fix the error and re-generate the SQL\n
"}]

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

```
[ERROR-SQL] Failed to generate SQL for prompt:
        For the question
         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
    ,
        the generated SQL statement None results in the following exception
[ERROR-SQL] Failed to generate SQL for prompt:
         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
     with the following exception:
an unknown error was encountered while running the model  .
        Please fix the error and re-generate the SQL
         with the following exception:
an unknown error was encountered while running the model
*** RETRY 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    B
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 "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    Address
NVARCHAR(70),\r\n    City NVARCHAR(40),\r\n    State NVARCHAR(40),\r\n    Co
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    Sup
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    Bi
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
\n    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 INDEX IFK_InvoiceLineInvoiceId ON "invoice_items" (InvoiceId)
\n\nCREATE INDEX IFK_InvoiceCustomerId ON "invoices" (CustomerId)\n\nCREATE
TABLE "artists"\r\n(\r\n    ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT N
ULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE TABLE "albums"\r\n(\r\n    Alb
umId 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 INDEX IFK_InvoiceLineTrackId ON "invoice_items" (TrackId)
\n\nCREATE TABLE "tracks"\r\n(\r\n   TrackId INTEGER PRIMARY KEY AUTOINCREM
ENT 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 NOT NULL,\r\n   Bytes INTEGE
R,\r\n   UnitPrice NUMERIC(10,2) NOT NULL,\r\n   FOREIGN KEY (AlbumId) RE
FERENCES "albums" (AlbumId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTIO
N,\r\n   FOREIGN KEY (GenreId) REFERENCES "genres" (GenreId) \r\n\t\tON DEL
ETE NO ACTION ON UPDATE NO ACTION,\r\n   FOREIGN KEY (MediaTypeId) REFERENC
ES "media_types" (MediaTypeId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTI
ON\r\n)\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   e.g. country column name is \'country\', not \'Bil
lingCountry\'\n   \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
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'}, {'rol
e': 'user', 'content': '   \n   Find the top 5 customers who bought
the most albums in total quantity (across all invoices):\n   Hint: albu
m quantity is found in invoice_items, \n   '}, {'role': 'assistant', 'conte
nt': ' SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS To
talAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust
omerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.Cust
omerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5'}, {'role': 'user', 'conte
nt': "\n   For the question what are the top 5 countries that customers
come from?, \n   the generated SQL statement SELECT BillingCountry, CO
UNT(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY C
ustomerCount DESC\nLIMIT 5 results in the following exception [ERROR-DB] Fai
led to execute SQL: SELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM
customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT 5\n E
xecution failed on sql ' SELECT BillingCountry, COUNT(*) AS CustomerCount\nF
ROM customers\nGROUP BY BillingCountry\nORDER BY CustomerCount DESC\nLIMIT
5': no such column: BillingCountry .\n   Please fix the error and re-ge
nerate the SQL\n   "}, {'role': 'assistant', 'content': 'SELECT country
AS Top5Countries, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY countr
y\nORDER BY CustomerCount DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Find
the customer who bought the most albums in total quantity (across all invoic
es):'}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstNam
e, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOI
N invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.Invo
iceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DES
C\nLIMIT 1'}, {'role': 'user', 'content': 'Find the customer with the most i
nvoices '}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstN
ame, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoices\nFROM customers c\nJ
OIN invoices i ON c.CustomerId = i.CustomerId\nGROUP BY c.CustomerId\nORDER
BY NumberOfInvoices DESC\nLIMIT 1'}, {'role': 'user', 'content': 'Find the t
otal number of invoices per country'}, {'role': 'assistant', 'content': ' SE
LECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY Bill
ingCountry'}, {'role': 'user', 'content': "which table stores customer's ord

ers"}, {'role': 'assistant', 'content': 'SELECT DISTINCT InvoiceId, Customer Id, InvoiceDate, BillingAddress, BillingCity, BillingState, BillingCountry, BillingPostalCode, Total\nFROM invoices'}, {'role': 'user', 'content': 'Get the total number of invoices for each customer'}, {'role': 'assistant', 'con tent': ' SELECT CustomerId, COUNT(*) AS TotalInvoices\nFROM invoices\nGROUP BY CustomerId'}, {'role': 'user', 'content': 'Find all invoices since 2010 a nd the total amount invoiced:'}, {'role': 'assistant', 'content': "SELECT In voiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role': 'user', 'content': ' Get the average invoice total for each customer:'}, {'role': 'assistant', 'content': ' SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP BY CustomerId'}, {'r ole': 'user', 'content': 'List all invoices with a total exceeding $10'}, {'role': 'assistant', 'content': ' SELECT * FROM invoices WHERE Total > 1 0'}, {'role': 'user', 'content': '\n For the question \n For t he question \n Find the top 5 customers who spent the most money o verall, \n Hint: order total can be found on invoices table, calcul ation using invoice_items detail table is unnecessary \n , \n the generated SQL statement None results in the following exception [ERROR-SQL] 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 unnecessary \n with the following exception: \nan unknown error was encountered whil e running the model .\n Please fix the error and re-generate the SQL \n , \n the generated SQL statement None results in the follow ing exception [ERROR-SQL] Failed to generate SQL for prompt: \n For t he question \n Find the top 5 customers who spent the most money o verall, \n Hint: order total can be found on invoices table, calcul ation using invoice_items detail table is unnecessary \n , \n the generated SQL statement None results in the following exception [ERROR-SQL] 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 unnecessary \n with the following exception: \nan unknown error was encountered whil e running the model .\n Please fix the error and re-generate the SQL \n with the following exception: \nan unknown error was encountered while running the model .\n Please fix the error and re-generate the SQL\n '}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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 B 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 \"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
\n   LastName NVARCHAR(20) NOT NULL,\r\n   Company NVARCHAR(80),\r\n   A
ddress NVARCHAR(70),\r\n   City NVARCHAR(40),\r\n   State 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 \"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
\n   BirthDate DATETIME,\r\n   HireDate DATETIME,\r\n   Address NVARCHAR
(70),\r\n   City 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 INDEX IFK_InvoiceLineInvoiceId ON \"invoice_items\"
(InvoiceId)\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 TABLE \"albums
\"\r\n(\r\n   AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Ti
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 ACT
ION ON UPDATE NO ACTION\r\n)\n\nCREATE INDEX IFK_InvoiceLineTrackId ON \"inv
oice_items\" (TrackId)\n\nCREATE TABLE \"tracks\"\r\n(\r\n   TrackId INTEGE
R 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 NOT NUL
L,\r\n   Bytes INTEGER,\r\n   UnitPrice NUMERIC(10,2) NOT NULL,\r\n   FO
REIGN KEY (AlbumId) REFERENCES \"albums\" (AlbumId) \r\n\t\tON DELETE NO ACT
ION ON UPDATE NO ACTION,\r\n   FOREIGN KEY (GenreId) REFERENCES \"genres\"
(GenreId) \r\n\t\tON DELETE NO ACTION ON UPDATE NO ACTION,\r\n   FOREIGN KE
Y (MediaTypeId) REFERENCES \"media_types\" (MediaTypeId) \r\n\t\tON DELETE N
O ACTION ON UPDATE NO ACTION\r\n)\n\n\n===Additional Context \n\nIn the chin
ook database invoice 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
provided context is sufficient, please generate a valid SQL query without an
y explanations for the question. \n2. If the provided context is almost suff
icient but requires knowledge of a specific string in a particular column, p
lease generate an intermediate SQL query to find the distinct strings in tha
t column. Prepend the query with a comment saying intermediate_sql \n3. If t
he provided context is insufficient, please explain why it can't be generate
d. \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": "   \n   Find the top 5 cu
stomers 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,
SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON
c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.Invoi
ceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5"},

{"role": "user", "content": "\n For the question what are the top 5 c
ountries that customers come from?, \n the generated SQL statement S
ELECT BillingCountry, COUNT(*) AS CustomerCount\nFROM customers\nGROUP BY Bi
llingCountry\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 Customer
Count DESC\nLIMIT 5\n Execution failed on sql ' SELECT BillingCountry, COUNT
(*) AS CustomerCount\nFROM customers\nGROUP BY BillingCountry\nORDER BY Cust
omerCount DESC\nLIMIT 5': no such column: BillingCountry .\n Please f
ix the error and re-generate the SQL\n "}, {"role": "assistant", "con
tent": "SELECT country AS Top5Countries, COUNT(*) AS CustomerCount\nFROM cus
tomers\nGROUP BY country\nORDER BY CustomerCount DESC\nLIMIT 5"}, {"role":
"user", "content": "Find the customer who bought the most albums in total qu
antity (across all invoices):"}, {"role": "assistant", "content": " SELECT
c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantit
y\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN in
voice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER B
Y TotalAlbumQuantity DESC\nLIMIT 1"}, {"role": "user", "content": "Find the
customer with the most invoices "}, {"role": "assistant", "content": " SELEC
T c.CustomerId, c.FirstName, c.LastName, COUNT(i.InvoiceId) AS NumberOfInvoi
ces\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nGROUP
BY c.CustomerId\nORDER BY NumberOfInvoices DESC\nLIMIT 1"}, {"role": "user",
"content": "Find the total number of invoices per country"}, {"role": "assis
tant", "content": " SELECT BillingCountry, COUNT(*) AS TotalInvoices\nFROM i
nvoices\nGROUP BY BillingCountry"}, {"role": "user", "content": "which table
stores customer's orders"}, {"role": "assistant", "content": "SELECT DISTINC
T InvoiceId, CustomerId, InvoiceDate, BillingAddress, BillingCity, BillingSt
ate, BillingCountry, BillingPostalCode, Total\nFROM invoices"}, {"role": "us
er", "content": "Get the total number of invoices for each customer"}, {"rol
e": "assistant", "content": " SELECT CustomerId, COUNT(*) AS TotalInvoices\n
FROM invoices\nGROUP BY CustomerId"}, {"role": "user", "content": "Find all
invoices since 2010 and the total amount invoiced:"}, {"role": "assistant",
"content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices
\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": " Get the
average invoice total for each customer:"}, {"role": "assistant", "content":
" SELECT CustomerId, AVG(Total) AS AverageInvoiceTotal\nFROM invoices\nGROUP
BY CustomerId"}, {"role": "user", "content": "List all invoices with a total
exceeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices W
HERE Total > 10"}, {"role": "user", "content": "\n For the question
\n For the question \n Find the top 5 customers who spent t
he most money overall, \n Hint: order total can be found on invoice
s table, calculation using invoice_items detail table is unnecessary \n ,
\n the generated SQL statement None results in the following exceptio
n [ERROR-SQL] Failed to generate SQL for prompt: \n Find the top 5
customers who spent the most money overall, \n Hint: order total ca
n be found on invoices table, calculation using invoice_items detail table i
s unnecessary \n with the following exception: \nan unknown error was en
countered while running the model .\n Please fix the error and re-ge
nerate the SQL\n , \n the generated SQL statement None results
in the following exception [ERROR-SQL] Failed to generate SQL for prompt: \n
For the question \n Find the top 5 customers who spent the most mo
ney overall, \n Hint: order total can be found on invoices table, c
alculation using invoice_items detail table is unnecessary \n , \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
ry \n     with the following exception: \nan unknown error was encountered w
hile running the model  .\n        Please fix the error and re-generate the
SQL\n         with the following exception: \nan unknown error was encounter
ed while running the model  .\n        Please fix the error and re-generate
the SQL\n        "}]
```

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

```
[ERROR-SQL] Failed to generate SQL for prompt:
        For the question
        For the question
         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
    ,
        the generated SQL statement None results in the following exception
[ERROR-SQL] Failed to generate SQL for prompt:
         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
     with the following exception:
an unknown error was encountered while running the model  .
        Please fix the error and re-generate the SQL
        ,
        the generated SQL statement None results in the following exception
[ERROR-SQL] Failed to generate SQL for prompt:
        For the question
         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
    ,
        the generated SQL statement None results in the following exception
[ERROR-SQL] Failed to generate SQL for prompt:
         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
     with the following exception:
an unknown error was encountered while running the model  .
        Please fix the error and re-generate the SQL
         with the following exception:
an unknown error was encountered while running the model  .
        Please fix the error and re-generate the SQL
         with the following exception:
an unknown error was encountered while running the model

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


[( 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
KEY AUTOINCREMENT NOT NULL,\r\n    Name NVARCHAR(120)\r\n)\n\nCREATE TABLE
"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    FOREIGN KEY (Tr
```

ackId) REFERENCES "tracks" (TrackId) \r\n\t\tON DELETE NO ACTION ON UPDATE N
O 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   Album
Id INTEGER,\r\n   MediaTypeId INTEGER NOT NULL,\r\n   GenreId INTEGER,\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 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_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
TABLE "genres"\r\n(\r\n   GenreId INTEGER PRIMARY KEY AUTOINCREMENT NOT NUL
L,\r\n   Name NVARCHAR(120)\r\n)\n\n\n===Additional Context \n\nIn the chin
ook database invoice means order\n\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': ' \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
d,\n   '}, {'role': 'assistant', 'content': ' SELECT a.ArtistId, 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\nGRO
UP BY a.ArtistId\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, {'role': 'user',
'content': 'List all genres and the number of tracks in each genre:'}, {'rol
e': 'assistant', 'content': ' \nSELECT g.Name AS GenreName, COUNT(t.TrackId)
AS NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreId = t.GenreI
d\nGROUP BY g.GenreId'}, {'role': 'user', 'content': 'Find all tracks with a
name containing "What" (case-insensitive) '}, {'role': 'assistant', 'conten
t': " SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {'role': 'use
r', 'content': 'Find the top 5 most expensive tracks (based on unit pric
e):'}, {'role': 'assistant', 'content': ' SELECT Name, UnitPrice\nFROM track
s\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'role': 'user', 'content': '   \n
Find the top 5 customers who bought the most albums in total quantity (acros
s all invoices):\n   Hint: album quantity is found in invoice_items, \n
'}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstName, c.
LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN inv
oices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId
= ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIM
IT 5'}, {'role': 'user', 'content': 'Find the customer who bought the most a
lbums in total quantity (across all invoices):'}, {'role': 'assistant', 'con
tent': ' SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS

TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cu
stomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.Cu
stomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 1'}, {'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': 'us
er', 'content': 'Find all invoices since 2010 and the total amount invoice
d:'}, {'role': 'assistant', 'content': "SELECT InvoiceId, CustomerId, Invoic
eDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {'role':
'user', 'content': 'List all invoices with a total exceeding $10'}, {'role':
'assistant', 'content': ' SELECT * 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 containing
at least 10 tracks and the total duration of those tracks:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   Tra
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   FOREIGN
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
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 (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 INDEX IFK_TrackAlbumId ON \"tracks\" (AlbumId)\n\nCREATE INDE
X IFK_TrackMediaTypeId ON \"tracks\" (MediaTypeId)\n\nCREATE INDEX IFK_Album
ArtistId ON \"albums\" (ArtistId)\n\nCREATE TABLE \"albums\"\r\n(\r\n   Alb
umId 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 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\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   e.g. c
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 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": " \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 ArtistId, albums and tracks are linked by AlbumId,\n "}, {"role": "assistant", "content": " SELECT a.ArtistId, 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\nORDER BY NumberOfTracks DESC\nLIMIT 10"}, {"role": "user", "content": "List all genres and the number of tracks in each genre:"}, {"role": "assistant", "content": " \nSELECT g.Name AS GenreName, COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreId = t.GenreId\nGROUP BY g.GenreId"}, {"role": "user", "content": "Find all tracks with a name containing \"What\" (case-insensitive) "}, {"role": "assistant", "content": " SELECT * FROM tracks\nWHERE LOWER(Name) LIKE '%what%'"}, {"role": "user", "content": "Find the top 5 most expensive tracks (based on unit price):"}, {"role": "assistant", "content": " SELECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"role": "user", "content": " \n 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 "}, {"role": "assistant", "content": " SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5"}, {"role": "user", "content": "Find the customer who bought the most albums in total quantity (across all invoices):"}, {"role": "assistant", "content": " SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 1"}, {"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.ArtistId"}, {"role": "user", "content": "Find all invoices since 2010 and the total amount invoiced:"}, {"role": "assistant", "content": "SELECT InvoiceId, CustomerId, InvoiceDate, Total\nFROM invoices\nWHERE InvoiceDate >= '2010-01-01'"}, {"role": "user", "content": "List all invoices with a total exceeding $10"}, {"role": "assistant", "content": " SELECT * FROM invoices 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 all playlists containing at least 10 tracks and the total duration of those tracks:"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:36:56.962141986Z', 'message': {'role': 'assistant', 'content': ' INTERMEDIATE_SQL\n-- First, find all playlists that have a count of tracks greater than or equal to 10.\nSELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount\nFROM playlists p\nJOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId\nGROUP BY p.PlaylistId\nHAVING TrackCount >= 10;\n\n-- Now, calculate the total duration of tr

acks in those playlists.\nSELECT p.PlaylistId, SUM(t.Milliseconds) AS TotalD
uration\nFROM playlists p\nJOIN playlist_track pt ON p.PlaylistId = pt.Playl
istId\nJOIN tracks t ON pt.TrackId = t.TrackId\nWHERE p.PlaylistId IN (\n
SELECT DISTINCT PlaylistId\n   FROM (\n   SELECT p.PlaylistId, COUNT(p
t.TrackId) AS TrackCount\n   FROM playlists p\n   JOIN playlist_tr
ack pt ON p.PlaylistId = pt.PlaylistId\n   GROUP BY p.PlaylistId\n
HAVING TrackCount >= 10\n   )\n)\nGROUP BY p.PlaylistId;'}, 'done_reason':
'stop', 'done': True, 'total_duration': 67435804502, 'load_duration': 594147
4512, 'prompt_eval_count': 1513, 'prompt_eval_duration': 40038345000, 'eval_
count': 237, 'eval_duration': 20109660000}

[(LLM Response)]
 INTERMEDIATE_SQL

```
-- First, find all playlists that have a count of tracks greater than or equ
al to 10.
SELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount
FROM playlists p
JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
GROUP BY p.PlaylistId
HAVING TrackCount >= 10;

-- Now, calculate the total duration of tracks in those playlists.
SELECT p.PlaylistId, SUM(t.Milliseconds) AS TotalDuration
FROM playlists p
JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
JOIN tracks t ON pt.TrackId = t.TrackId
WHERE p.PlaylistId IN (
    SELECT DISTINCT PlaylistId
    FROM (
        SELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount
        FROM playlists p
        JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
        GROUP BY p.PlaylistId
        HAVING TrackCount >= 10
    )
)
GROUP BY p.PlaylistId;
```

[(Output from LLM)]
  INTERMEDIATE_SQL

```
-- First, find all playlists that have a count of tracks greater than or equ
al to 10.
SELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount
FROM playlists p
JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
GROUP BY p.PlaylistId
HAVING TrackCount >= 10;

-- Now, calculate the total duration of tracks in those playlists.
SELECT p.PlaylistId, SUM(t.Milliseconds) AS TotalDuration
FROM playlists p
JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
JOIN tracks t ON pt.TrackId = t.TrackId
WHERE p.PlaylistId IN (
    SELECT DISTINCT PlaylistId
    FROM (
```

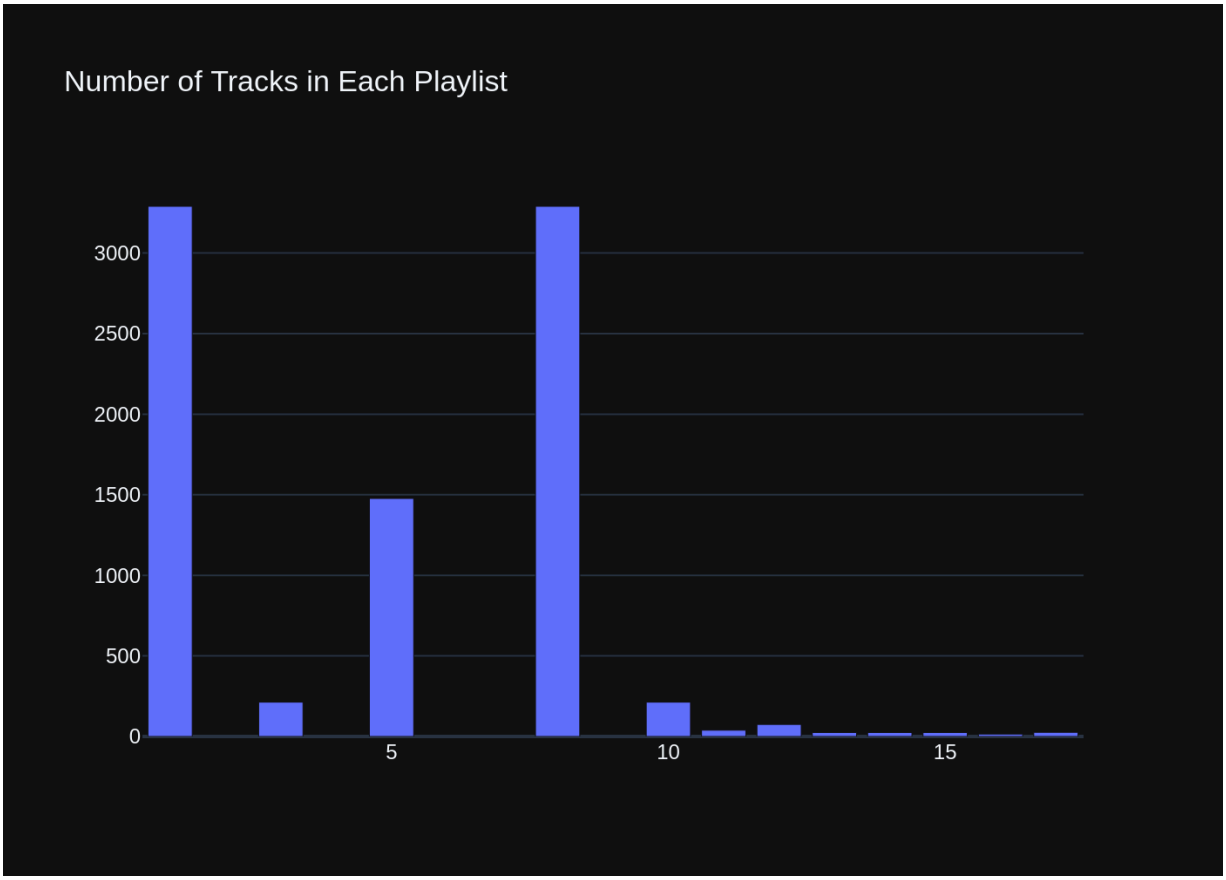
```
        SELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount
        FROM playlists p
        JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
        GROUP BY p.PlaylistId
        HAVING TrackCount >= 10
    )
)
GROUP BY p.PlaylistId;
[( Extracted SQL )]
 SELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount
FROM playlists p
JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
GROUP BY p.PlaylistId
HAVING TrackCount >= 10
```

```
SELECT p.PlaylistId, COUNT(pt.TrackId) AS TrackCount
FROM playlists p
JOIN playlist_track pt ON p.PlaylistId = pt.PlaylistId
GROUP BY p.PlaylistId
HAVING TrackCount >= 10
```

	PlaylistId	TrackCount
0	1	3290
1	3	213
2	5	1477
3	8	3290
4	10	213
5	11	39
6	12	75
7	13	25
8	14	25
9	15	25
10	16	15
11	17	26

```
[Ollama parameters]
model=deepseek-coder-v2:latest,
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, COUNT(pt.TrackId) AS TrackCount\nFROM playlists p\nJOIN playlist_track p
t ON p.PlaylistId = pt.PlaylistId\nGROUP BY p.PlaylistId\nHAVING TrackCount
>= 10\n\nThe following is information about the resulting pandas DataFrame
'df': \nRunning df.dtypes gives:\n PlaylistId    int64\nTrackCount    int64
\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': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:37:10.709
160494Z', 'message': {'role': 'assistant', 'content': ' ```python\nimport pl
otly.graph_objects as go\n\nfig = go.Figure()\n\nif df[\'TrackCount\'].nuniq
ue() == 1:\n    fig.add_trace(go.Indicator(\n        mode="number",\n
value=df[\'TrackCount\'].iloc[0],\n        title={"text": "Total Track Coun
t"}\n    ))\nelse:\n    fig.add_bar(x=df[\'PlaylistId\'], y=df[\'TrackCount
\'], name=\'Track Count\')\n\nfig.update_layout(title="Number of Tracks in E
ach Playlist")\nfig.show()\n```'}, 'done_reason': 'stop', 'done': True, 'tot
al_duration': 13721176866, 'load_duration': 48490803, 'prompt_eval_count': 2
13, 'prompt_eval_duration': 4272928000, 'eval_count': 137, 'eval_duration':
9349388000}
```

```python
import plotly.graph_objects as go

fig = go.Figure()

if df['TrackCount'].nunique() == 1:
    fig.add_trace(go.Indicator(
        mode="number",
        value=df['TrackCount'].iloc[0],
        title={"text": "Total Track Count"}
    ))
else:
    fig.add_bar(x=df['PlaylistId'], y=df['TrackCount'], name='Track Count')

fig.update_layout(title="Number of Tracks in Each Playlist")
```




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

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


[( 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    Albu
mId INTEGER,\r\n    MediaTypeId INTEGER  NOT NULL,\r\n    GenreId INTEGER,\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 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_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    Albu
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 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    Arti
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
L,\r\n    TrackId INTEGER  NOT NULL,\r\n    CONSTRAINT PK_PlaylistTrack PRIM
ARY 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" (TrackId) \r\n\t\tON DELETE
NO ACTION ON UPDATE NO ACTION\r\n)\n\n\n===Additional Context \n\nIn the chi
nook database invoice means order\n\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
d,\n    '}, {'role': 'assistant', 'content': ' SELECT a.ArtistId, 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\nGRO
```

UP BY a.ArtistId\nORDER BY NumberOfTracks DESC\nLIMIT 10'}, {'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'}, {'role':
'user', 'content': 'List all genres and the number of tracks in each genr
e:'}, {'role': 'assistant', 'content': ' \nSELECT g.Name AS GenreName, COUNT
(t.TrackId) AS NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t ON g.GenreI
d = t.GenreId\nGROUP BY g.GenreId'}, {'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, COUNT(pt.TrackI
d) AS TrackCount\nFROM playlists p\nJOIN playlist_track pt ON p.PlaylistId =
pt.PlaylistId\nGROUP BY p.PlaylistId\nHAVING TrackCount >= 10'}, {'role': 'u
ser', 'content': '   \n   Find the top 5 customers who bought the mo
st albums in total quantity (across all invoices):\n   Hint: album quan
tity is found in invoice_items, \n   '}, {'role': 'assistant', 'content': '
SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbum
Quantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\n
JOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\n
ORDER BY TotalAlbumQuantity DESC\nLIMIT 5'}, {'role': 'user', 'content': 'Fi
nd the customer who bought the most albums in total quantity (across all inv
oices):'}, {'role': 'assistant', 'content': ' SELECT c.CustomerId, c.FirstN
ame, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM customers c\nJ
OIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii ON i.In
voiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQuantity D
ESC\nLIMIT 1'}, {'role': 'user', 'content': 'Find the top 5 most expensive t
racks (based on unit price):'}, {'role': 'assistant', 'content': ' SELECT Na
me, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5'}, {'role': 'us
er', 'content': 'Find all tracks with a name containing "What" (case-insensi
tive) '}, {'role': 'assistant', 'content': " SELECT * FROM tracks\nWHERE LOW
ER(Name) LIKE '%what%'"}, {'role': 'user', 'content': 'Can you list all tabl
es in the SQLite database catalog?'}, {'role': 'assistant', 'content': "SELE
CT name FROM sqlite_master WHERE type='table'"}, {'role': 'user', 'content':
'List all invoices with a total exceeding $10'}, {'role': 'assistant', 'cont
ent': ' SELECT * FROM invoices WHERE Total > 10'}, {'role': 'user', 'conten
t': 'Identify artists who have albums with tracks appearing in multiple genr
es:'}]

[Ollama parameters]
model=deepseek-coder-v2:latest,
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   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 (MediaTy
peId) REFERENCES \"media_types\" (MediaTypeId) \r\n\t\tON DELETE NO ACTION O
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
(\r\n   AlbumId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n   Title NV
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
sts\"\r\n(\r\n   ArtistId INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,\r\n
Name NVARCHAR(120)\r\n)\n\nCREATE TABLE \"playlist_track\"\r\n(\r\n   Playl
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
N UPDATE NO ACTION,\r\n   FOREIGN KEY (TrackId) REFERENCES \"tracks\" (Trac
kId) \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\n\n   In the 'cus
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": " \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   w
here albums and artists are linked by ArtistId, albums and tracks are linked
by AlbumId,\n   "}, {"role": "assistant", "content": " SELECT a.ArtistId,
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\nORDER BY NumberOfTracks DESC\nLIMIT 10"}, {"rol
e": "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.ArtistId"},
{"role": "user", "content": "List all genres and the number of tracks in eac
h genre:"}, {"role": "assistant", "content": " \nSELECT g.Name AS GenreName,
COUNT(t.TrackId) AS NumberOfTracks\nFROM genres g\nLEFT JOIN tracks t ON g.G
enreId = t.GenreId\nGROUP BY g.GenreId"}, {"role": "user", "content": "Get a
ll playlists containing at least 10 tracks and the total duration of those t
racks:"}, {"role": "assistant", "content": "SELECT p.PlaylistId, COUNT(pt.Tr
ackId) AS TrackCount\nFROM playlists p\nJOIN playlist_track pt ON p.Playlist
Id = pt.PlaylistId\nGROUP BY p.PlaylistId\nHAVING TrackCount >= 10"}, {"rol
e": "user", "content": "   \n   Find the top 5 customers who bought
the most albums in total quantity (across all invoices):\n   Hint: albu
m quantity is found in invoice_items, \n   "}, {"role": "assistant", "conte
nt": " SELECT c.CustomerId, c.FirstName, c.LastName, SUM(ii.Quantity) AS To
talAlbumQuantity\nFROM customers c\nJOIN invoices i ON c.CustomerId = i.Cust
omerId\nJOIN invoice_items ii ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.Cust
omerId\nORDER BY TotalAlbumQuantity DESC\nLIMIT 5"}, {"role": "user", "conte
nt": "Find the customer who bought the most albums in total quantity (across
all invoices):"}, {"role": "assistant", "content": " SELECT c.CustomerId,
c.FirstName, c.LastName, SUM(ii.Quantity) AS TotalAlbumQuantity\nFROM custom

ers c\nJOIN invoices i ON c.CustomerId = i.CustomerId\nJOIN invoice_items ii
ON i.InvoiceId = ii.InvoiceId\nGROUP BY c.CustomerId\nORDER BY TotalAlbumQua
ntity DESC\nLIMIT 1"}, {"role": "user", "content": "Find the top 5 most expe
nsive tracks (based on unit price):"}, {"role": "assistant", "content": " SE
LECT Name, UnitPrice\nFROM tracks\nORDER BY UnitPrice DESC\nLIMIT 5"}, {"rol
e": "user", "content": "Find all tracks with a name containing \"What\" (cas
e-insensitive) "}, {"role": "assistant", "content": " SELECT * FROM tracks\n
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"}, {"role": "assist
ant", "content": " SELECT * FROM invoices WHERE Total > 10"}, {"role": "use
r", "content": "Identify artists who have albums with tracks appearing in mu
ltiple genres:"}]

[(Ollama Response)]
{'model': 'deepseek-coder-v2:latest', 'created_at': '2024-10-12T17:38:25.420
653201Z', 'message': {'role': 'assistant', 'content': " To identify artists
who have albums with tracks appearing in multiple genres, we can follow thes
e steps:\n\n1. Join the `artists`, `albums`, and `tracks` tables to get a li
st of all track details along with their album and artist information.\n2. J
oin this result with the `genres` table to add genre information to each tra
ck.\n3. Group by the artist's name (or any identifier that uniquely identifi
es an artist) and check if there are multiple genres associated with the alb
ums of these artists.\n4. Select distinct artists who have albums with track
s in more than one genre.\n\nHere is a SQL query that accomplishes this:\n\n
```sql\nSELECT DISTINCT ar.Name AS ArtistName\nFROM artists ar\nJOIN albums
al ON ar.ArtistId = al.ArtistId\nJOIN tracks t ON al.AlbumId = t.AlbumId\nJO
IN genres g ON t.GenreId = g.GenreId\nGROUP BY ar.ArtistId, g.GenreId\nHAVIN
G COUNT(DISTINCT g.GenreId) > 1;\n```\n\nThis query does the following:\n- J
oins the `artists`, `albums`, and `tracks` tables to get track details along
with album and artist information.\n- Further joins this result with the `ge
nres` table to include genre information for each track.\n- Groups the resul
ts by the artist's unique identifier (`ArtistId`) and the genre (`GenreId`),
ensuring we group by both to ensure we only consider genres associated with
albums by a single artist.\n- Uses the `HAVING` clause to filter out artists
whose albums are in more than one genre, as indicated by having more than on
e distinct genre for their albums when grouped by artist."}, 'done_reason':
'stop', 'done': True, 'total_duration': 74603368251, 'load_duration': 761483
1, 'prompt_eval_count': 1529, 'prompt_eval_duration': 41585723000, 'eval_cou
nt': 368, 'eval_duration': 31567888000}

[( LLM Response )]
 To identify artists who have albums with tracks appearing in multiple genre
s, we can follow these steps:

1. Join the `artists`, `albums`, and `tracks` tables to get a list of all tr
ack details along with their album and artist information.
2. Join this result with the `genres` table to add genre information to each
track.
3. Group by the artist's name (or any identifier that uniquely identifies an
artist) and check if there are multiple genres associated with the albums of
these artists.
4. Select distinct artists who have albums with tracks in more than one genr
e.
```

Here is a SQL query that accomplishes this:

```sql
SELECT DISTINCT ar.Name AS ArtistName
FROM artists ar
JOIN albums al ON ar.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
JOIN genres g ON t.GenreId = g.GenreId
GROUP BY ar.ArtistId, g.GenreId
HAVING COUNT(DISTINCT g.GenreId) > 1;
```

This query does the following:
- Joins the `artists`, `albums`, and `tracks` tables to get track details al
ong with album and artist information.
- Further joins this result with the `genres` table to include genre informa
tion for each track.
- Groups the results by the artist's unique identifier (`ArtistId`) and the
genre (`GenreId`), ensuring we group by both to ensure we only consider genr
es associated with albums by a single artist.
- Uses the `HAVING` clause to filter out artists whose albums are in more th
an one genre, as indicated by having more than one distinct genre for their
albums when grouped by artist.

[(Output from LLM)]
  To identify artists who have albums with tracks appearing in multiple genr
es, we can follow these steps:

1. Join the `artists`, `albums`, and `tracks` tables to get a list of all tr
ack details along with their album and artist information.
2. Join this result with the `genres` table to add genre information to each
track.
3. Group by the artist's name (or any identifier that uniquely identifies an
artist) and check if there are multiple genres associated with the albums of
these artists.
4. Select distinct artists who have albums with tracks in more than one genr
e.

Here is a SQL query that accomplishes this:

```sql
SELECT DISTINCT ar.Name AS ArtistName
FROM artists ar
JOIN albums al ON ar.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
JOIN genres g ON t.GenreId = g.GenreId
GROUP BY ar.ArtistId, g.GenreId
HAVING COUNT(DISTINCT g.GenreId) > 1;
```

This query does the following:
- Joins the `artists`, `albums`, and `tracks` tables to get track details al
ong with album and artist information.
- Further joins this result with the `genres` table to include genre informa
tion for each track.
- Groups the results by the artist's unique identifier (`ArtistId`) and the

```
genre (`GenreId`), ensuring we group by both to ensure we only consider genr
es associated with albums by a single artist.
- Uses the `HAVING` clause to filter out artists whose albums are in more th
an one genre, as indicated by having more than one distinct genre for their
albums when grouped by artist.
[( Extracted SQL )]
 SELECT DISTINCT ar.Name AS ArtistName
FROM artists ar
JOIN albums al ON ar.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
JOIN genres g ON t.GenreId = g.GenreId
GROUP BY ar.ArtistId, g.GenreId
HAVING COUNT(DISTINCT g.GenreId) > 1
```

```
SELECT DISTINCT ar.Name AS ArtistName
FROM artists ar
JOIN albums al ON ar.ArtistId = al.ArtistId
JOIN tracks t ON al.AlbumId = t.AlbumId
JOIN genres g ON t.GenreId = g.GenreId
GROUP BY ar.ArtistId, g.GenreId
HAVING COUNT(DISTINCT g.GenreId) > 1
```

ArtistName

Check completion time

In [16]:
```
ts_stop = time()
elapsed_time = ts_stop - ts_start
str_elapsed_sec = f"{elapsed_time:.0f}"
ts = datetime.now().strftime("%Y%m%d-%H%M%S")
print(f"Completed testing:\n================\n LLM model '{model_name}' \n t
```

```
Completed testing:
================
 LLM model 'deepseek-coder-v2'
 took 1650 sec
 run on 'ducklover1'
 at 20241012-133825
```

In [17]:
```
file_csv = f"training_data-{model_name}-{str_elapsed_sec}s-{hostname}-{ts}.c
file_csv
```

Out[17]:
```
'training_data-deepseek-coder-v2-1650s-ducklover1-20241012-133825.csv'
```

Save training data

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

Out[18]:

	id	question	content	training_data_type
0	1d7747b2-4595-50e7-aba6-e9977afc4481-sql	List all genres and the number of tracks in ea...	\nSELECT g.Name AS GenreName, COUNT(t.TrackId...	sql
1	1fab2c67-0737-56ab-b3f1-33202750520a-sql	Find the top 5 most expensive tracks (based on...	SELECT Name, UnitPrice\nFROM tracks\nORDER BY...	sql
2	2057af51-0925-581d-aad4-e1c8fa6b02de-sql	Find the customer who bought the most albums i...	SELECT c.CustomerId, c.FirstName, c.LastName...	sql
3	2e2c32b7-40e9-5f31-975e-f70304ca85be-sql	\n Can you find the top 10 most popula...	SELECT a.ArtistId, a.Name AS ArtistName, COUN...	sql
4	30dadc3c-1c94-52c5-a81e-4970d8d4c0cd-sql	Get all playlists containing at least 10 track...	SELECT p.PlaylistId, COUNT(pt.TrackId) AS Trac...	sql
5	36d67a5d-4f89-5592-a61a-d8a768bcf02c-sql	Get the average invoice total for each customer:	SELECT CustomerId, AVG(Total) AS AverageInvoi...	sql
6	3c42c397-fe40-5629-ba95-4c8764b87790-sql	Find all tracks with a name containing "What" ...	SELECT * FROM tracks\nWHERE LOWER(Name) LIKE ...	sql
7	5610475a-bbee-5f6a-bb08-7987a50220a7-sql	List all albums and their corresponding artist...	SELECT a.Title AS AlbumTitle, ar.Name AS Artis...	sql
8	59ee3f97-0080-5db6-b709-b94fb9308167-sql	Find the total number of invoices per country	SELECT BillingCountry, COUNT(*) AS TotalInvoi...	sql
9	5f93b5e8-549d-5c06-bf3f-22f32f65b1c5-sql	\n For the question what are the top 5 ...	SELECT country AS Top5Countries, COUNT(*) AS C...	sql
10	6cc1928a-0b0d-50fc-ba2a-dde846107b62-sql	List all customers from Canada and their email...	SELECT Email, Country\nFROM customers\nWHERE ...	sql
11	775fdf5b-53e2-5745-84bc-63630da0a97f-sql	\n Find the top 5 customers who b...	SELECT c.CustomerId, c.FirstName, c.LastName...	sql
12	93714b9a-4334-59c0-98f7-72176ee7e8de-sql	List all invoices with a total exceeding $10	SELECT * FROM invoices WHERE Total > 10	sql
13	9d3783c1-033a-5da3-883a-ec56055dc429-sql	Find all invoices since 2010 and the total amo...	SELECT InvoiceId, CustomerId, InvoiceDate, Tot...	sql

	id	question	content	training_data_type
14	a6c6b2ef-cd65-5043-a9f4-7e650a0c1d9a-sql	Get the total number of invoices for each cust...	SELECT CustomerId, COUNT(*) AS TotalInvoices\...	sql
15	bd7cc9b7-821c-5148-a945-76b1d324c36e-sql	List all employees and their reporting manager...	SELECT e.FirstName, e.LastName, m.FirstName AS...	sql
16	d5b91961-7241-5060-8059-5f7132d57713-sql	which table stores customer's orders	SELECT DISTINCT InvoiceId, CustomerId, Invoice...	sql
17	d8a2f948-dffa-5524-a5f9-174cc1a8da73-sql	Can you list all tables in the SQLite database...	SELECT name FROM sqlite_master WHERE type='table'	sql
18	dd3c468c-cac8-5845-9cb9-d3b8aeeede8e-sql	Find the customer with the most invoices	SELECT c.CustomerId, c.FirstName, c.LastName,...	sql
19	e69b6701-d7ee-5d3e-add6-eb8bd4aaa8b7-sql	How many customers are there	SELECT COUNT(*) AS NumberOfCustomers FROM cust...	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-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

	id	question	content	training_data_type
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
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

	id	question	content	training_data_type
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

In [19]:
```
df_training_data.to_csv(file_csv, index=False)
```

!cat training_data-deepseek-coder-v2-38054s-ducklover1-20241012-115724.csv

In [ ]:
```
```