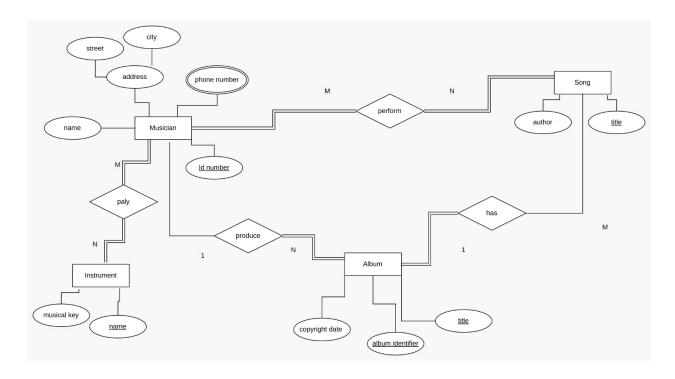
# **Music company Database System**

Project no. (5)

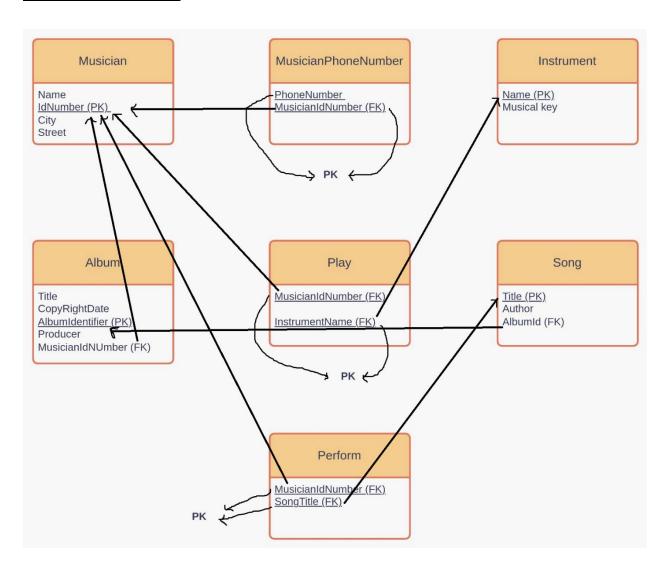
Group no. (14)

Mahmoud Abdelaty Azzouz Ramy Youhana Ahmed Salah

## ER Diagram:



## **Relational Model:**



## **Codes:**

```
-- SQL statements for creating the tables
-- Musician Table
CREATE TABLE Musician (
  ID INT PRIMARY KEY,
  Name VARCHAR(255),
  Street VARCHAR(255),
  City VARCHAR(255)
);
-- MusicianPhoneNumber Table
CREATE TABLE MusicianPhoneNumber (
  ID INT,
  PhoneNumber VARCHAR(15),
  PRIMARY KEY (ID, PhoneNumber),
  FOREIGN KEY (ID) REFERENCES Musician(ID)
);
-- Instrument Table
CREATE TABLE Instrument (
  Name VARCHAR(255) PRIMARY KEY,
  MusicalKey VARCHAR(10)
);
-- Album Table
CREATE TABLE Album (
  AlbumIdentifier INT PRIMARY KEY,
  Title VARCHAR(255),
  CopyrightDate DATE,
  Producer INT,
  FOREIGN KEY (Producer) REFERENCES Musician(ID)
);
-- Song Table
CREATE TABLE Song (
  Title VARCHAR(255) PRIMARY KEY,
  Author VARCHAR(255),
  AlbumID INT,
  FOREIGN KEY (AlbumID) REFERENCES Album(AlbumIdentifier)
);
-- Performs Table
```

```
CREATE TABLE Performs (
  MusicianID INT,
  SongTitle VARCHAR(255),
  PRIMARY KEY (MusicianID, SongTitle),
  FOREIGN KEY (MusicianID) REFERENCES Musician(ID),
  FOREIGN KEY (SongTitle) REFERENCES Song(Title)
);
-- Plays Table
CREATE TABLE Plays (
  MusicianID INT,
  InstrumentName VARCHAR(255),
  PRIMARY KEY (MusicianID, InstrumentName),
  FOREIGN KEY (MusicianID) REFERENCES Musician(ID),
  FOREIGN KEY (InstrumentName) REFERENCES Instrument(Name)
);
-- SQL statements for inserting data sample
-- Inserting sample data into the Musician table
INSERT INTO Musician (ID, Name, Street, City) VALUES
 (1, 'John Doe', '123 Main St', 'New York'),
 (2, 'Jane Smith', '456 Oak St', 'Los Angeles'),
 (3, 'Alex Johnson', '789 Pine St', 'Chicago'),
 (4, 'Emily Davis', '101 Elm St', 'San Francisco'),
 (5, 'Michael White', '222 Maple St', 'Miami'),
 (6, 'Jessica Brown', '333 Cedar St', 'Seattle'),
 (7, 'David Miller', '444 Birch St', 'Dallas'),
 (8, 'Sophia Jones', '555 Redwood St', 'Phoenix'),
 (9, 'William Wilson', '666 Sequoia St', 'Atlanta'),
 (10, 'Olivia Lee', '777 Mahogany St', 'Denver');
-- Inserting sample data into the MusicianPhoneNumber table
INSERT INTO MusicianPhoneNumber (ID, PhoneNumber) VALUES
 (1, '555-1234'),
 (2, '555-5678'),
 (3, '555-9876'),
 (4, '555-4321'),
 (5, '555-1111'),
 (6, '555-2222'),
 (7, '555-3333'),
 (8, '555-4444'),
 (9, '555-5555'),
 (10, '555-6666');
```

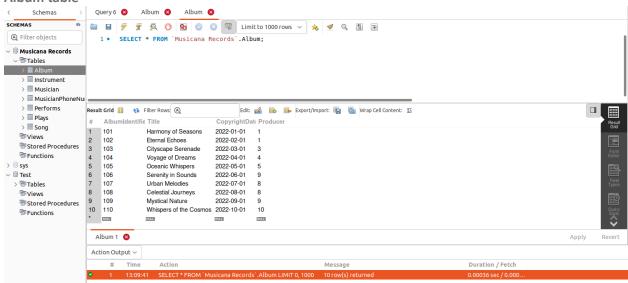
```
-- Inserting sample data into the Instrument table
INSERT INTO Instrument (Name, MusicalKey) VALUES
 ('Guitar', 'C'),
 ('Piano', 'A'),
 ('Bass Guitar', 'E'),
 ('Drums', 'Percussion'),
 ('Saxophone', 'B-flat'),
 ('Violin', 'G'),
 ('Trumpet', 'B-flat'),
 ('Flute', 'C'),
 ('Clarinet', 'B-flat'),
 ('Trombone', 'C');
-- Inserting sample data into the Album table
INSERT INTO Album (AlbumIdentifier, Title, CopyrightDate, Producer) VALUES
(101, 'Harmony of Seasons', '2022-01-01', 1),
 (102, 'Eternal Echoes', '2022-02-01', 1),
 (103, 'Cityscape Serenade', '2022-03-01', 3),
 (104, 'Voyage of Dreams', '2022-04-01', 4),
 (105, 'Oceanic Whispers', '2022-05-01', 5),
 (106, 'Serenity in Sounds', '2022-06-01', 9),
 (107, 'Urban Melodies', '2022-07-01', 8),
 (108, 'Celestial Journeys', '2022-08-01', 8),
 (109, 'Mystical Nature', '2022-09-01', 9),
 (110, 'Whispers of the Cosmos', '2022-10-01', 10);
-- Inserting sample data into the Song table
INSERT INTO Song (Title, Author, AlbumID) VALUES
 ('Whispers in the Wind', 'Sarah Johnson', 101),
 ('Moonlit Serenade', 'Ahmed Ibrahim', 101),
 ('Eternal Love', 'Layla Hassan', 102),
 ('Sunset Dreams', 'Amr Mohamed', 103),
 ('City Lights', 'Nour Ali', 103),
 ('Ocean Breeze', 'Omar Mahmoud', 104),
 ('Eastern Delight', 'Hana Mustafa', 105),
 ('Urban Nights', 'Youssef Khalil', 105),
 ('Stargazing', 'Fayza Ahmed', 106),
 ('Sands of Time', 'Karim Mansour', 106),
 ('Metropolitan Groove', 'Aya Kamal', 107),
 ('Urban Reflections', 'Samir Hafez', 107),
 ('Nature Harmony', 'Yara Abdelrahman', 108),
 ('Mountain Serenity', 'Tarek Salah', 108),
 ('Desert Oasis', 'Leila Sami', 109),
 ('Riverside Melody', 'Ahmed Reda', 109),
 ('Starry Night', 'Sara Abdelhamid', 110),
 ('Celestial Symphony', 'Omar El-Masry', 110);
```

```
-- Inserting sample data into the Performs table
INSERT INTO Performs (MusicianID, SongTitle) VALUES
(1, 'Whispers in the Wind'),
(1, 'Moonlit Serenade'),
(2, 'Eternal Love'),
(3, 'Sunset Dreams'),
(3, 'City Lights'),
(4, 'Ocean Breeze'),
(5, 'Eastern Delight'),
 (5, 'Urban Nights'),
 (6, 'Stargazing'),
 (6, 'Sands of Time'),
(7, 'Metropolitan Groove'),
 (7, 'Urban Reflections'),
 (8, 'Nature Harmony'),
 (8, 'Mountain Serenity'),
 (9, 'Desert Oasis'),
(9, 'Riverside Melody'),
(10, 'Starry Night'),
(10, 'Celestial Symphony');
-- Inserting sample data into the Plays table
INSERT INTO Plays (MusicianID, InstrumentName) VALUES
(1, 'Guitar'),
(1, 'Piano'),
(2, 'Piano'),
(2, 'Guitar'),
(3, 'Bass Guitar'),
(3, 'Drums'),
(4, 'Saxophone'),
(5, 'Violin'),
 (5, 'Trumpet'),
(6, 'Flute'),
 (6, 'Clarinet'),
(7, 'Trombone'),
 (7, 'Guitar'),
 (8, 'Piano'),
 (8, 'Bass Guitar'),
(9, 'Drums'),
(9, 'Saxophone'),
 (10, 'Violin'),
```

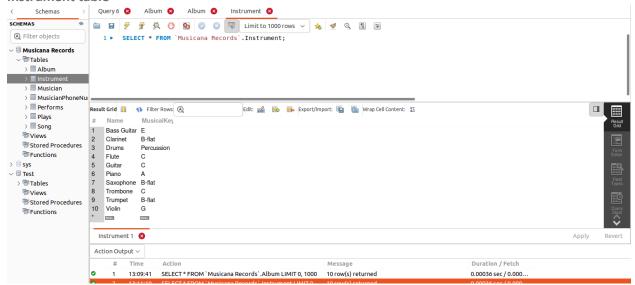
(10, 'Trumpet');

### **Implementation Part:**

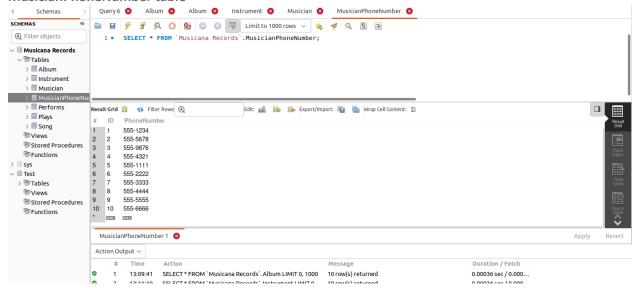




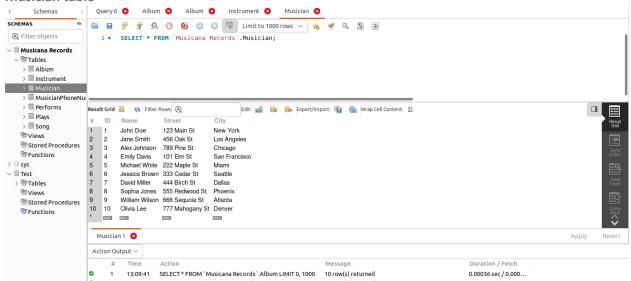
#### Instrument table



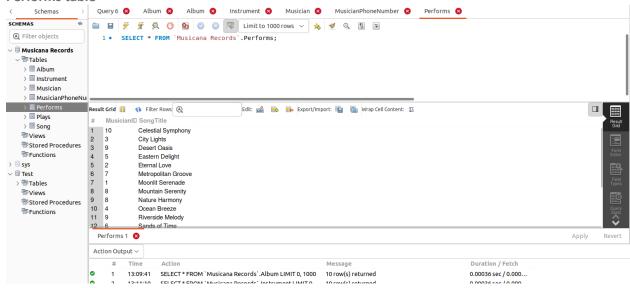
#### MusicianPhoneNumber table



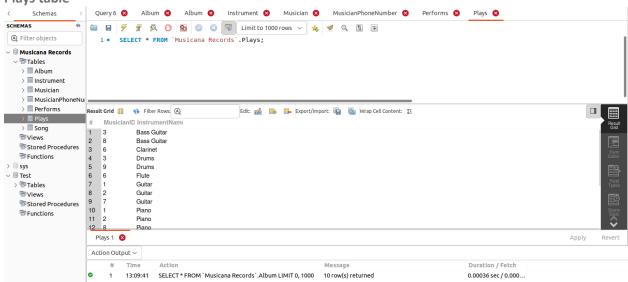
#### Musician table

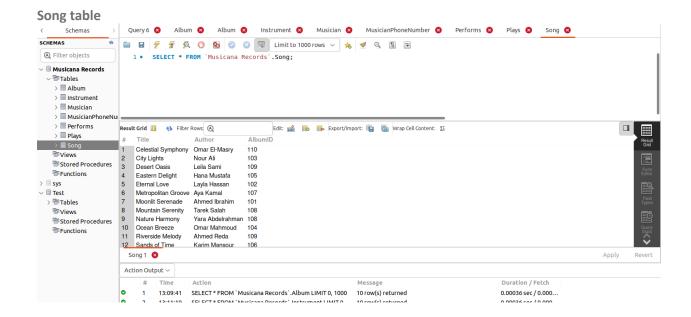


#### Performs table



#### Plays table



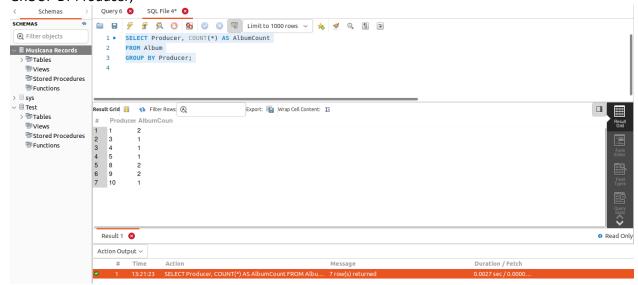


## **Business questions:**

10 business-related questions along with SQL queries to retrieve the answers from the provided database:

**1-Question**: How many albums were produced by each producer? SELECT Producer, COUNT(\*) AS AlbumCount FROM Album

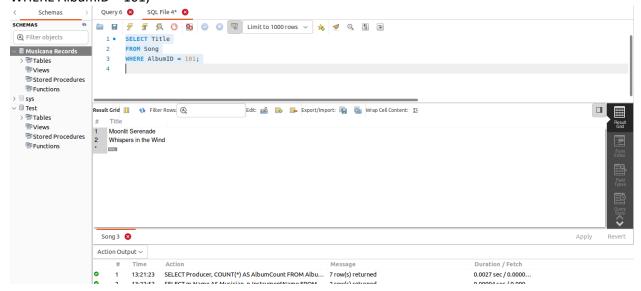




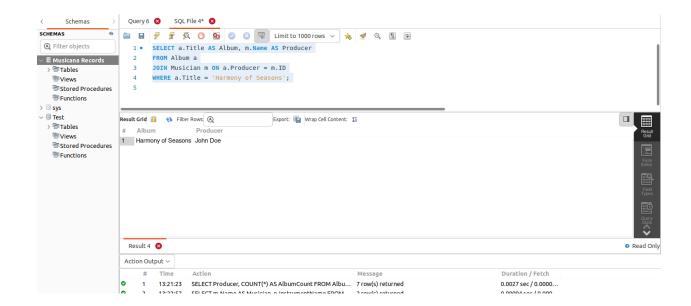
**2-Question**: List all songs in a specific album.

SELECT Title FROM Song

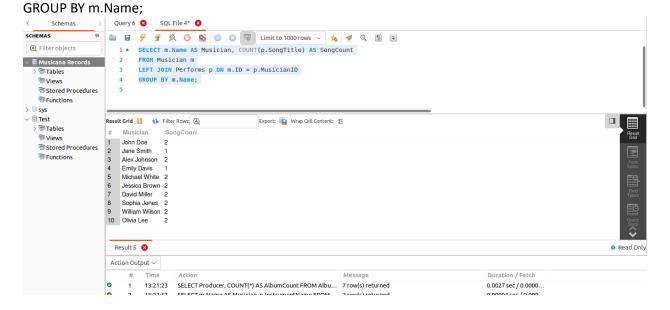
WHERE AlbumID = 101;



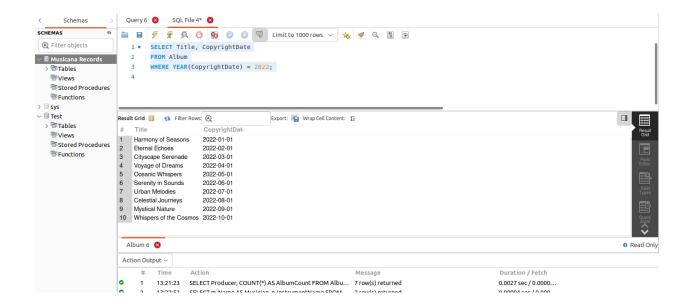
**3-Question**: Who is the producer of a specific album? SELECT a.Title AS Album, m.Name AS Producer FROM Album a JOIN Musician m ON a.Producer = m.ID WHERE a.Title = 'Harmony of Seasons';



**4-Question**: How many songs has each musician performed? SELECT m.Name AS Musician, COUNT(p.SongTitle) AS SongCount FROM Musician m
LEFT JOIN Performs p ON m.ID = p.MusicianID



**5-Question**: Which albums were released in a specific year? SELECT Title, CopyrightDate FROM Album WHERE YEAR(CopyrightDate) = 2022;

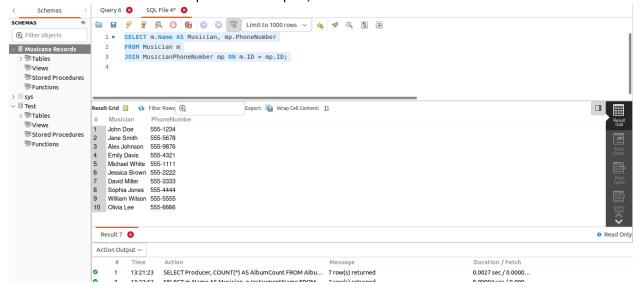


**6-Question**: List all musicians and their phone numbers.

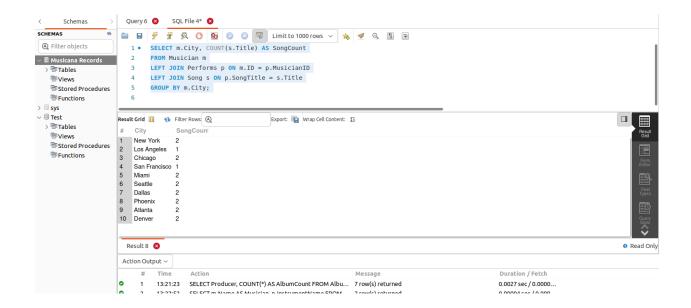
SELECT m.Name AS Musician, mp.PhoneNumber

FROM Musician m

JOIN MusicianPhoneNumber mp ON m.ID = mp.ID;



**7-Question**: What is the total count of songs in each city? SELECT m.City, COUNT(s.Title) AS SongCount FROM Musician m
LEFT JOIN Performs p ON m.ID = p.MusicianID
LEFT JOIN Song s ON p.SongTitle = s.Title
GROUP BY m.City;



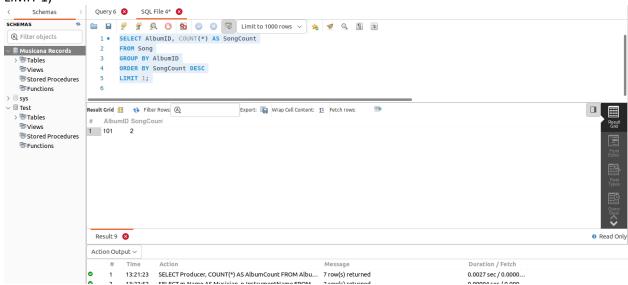
**8-Question**: Which albums have the most songs? SELECT AlbumID, COUNT(\*) AS SongCount

**FROM Song** 

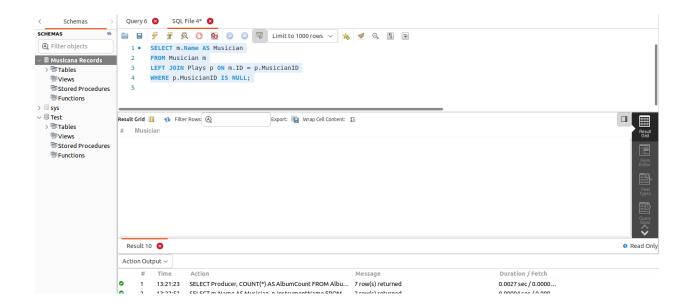
**GROUP BY AlbumID** 

**ORDER BY SongCount DESC** 

LIMIT 1;



**9-Question**: Which musicians have not played any instruments? SELECT m.Name AS Musician FROM Musician m
LEFT JOIN Plays p ON m.ID = p.MusicianID
WHERE p.MusicianID IS NULL;



10-Question: Find the most prolific songwriter (author) in terms of the number of songs.

SELECT Author, COUNT(\*) AS SongCount

FROM Song

GROUP BY Author

ORDER BY SongCount DESC

LIMIT 1;

