



I2210_Project

Music Hub

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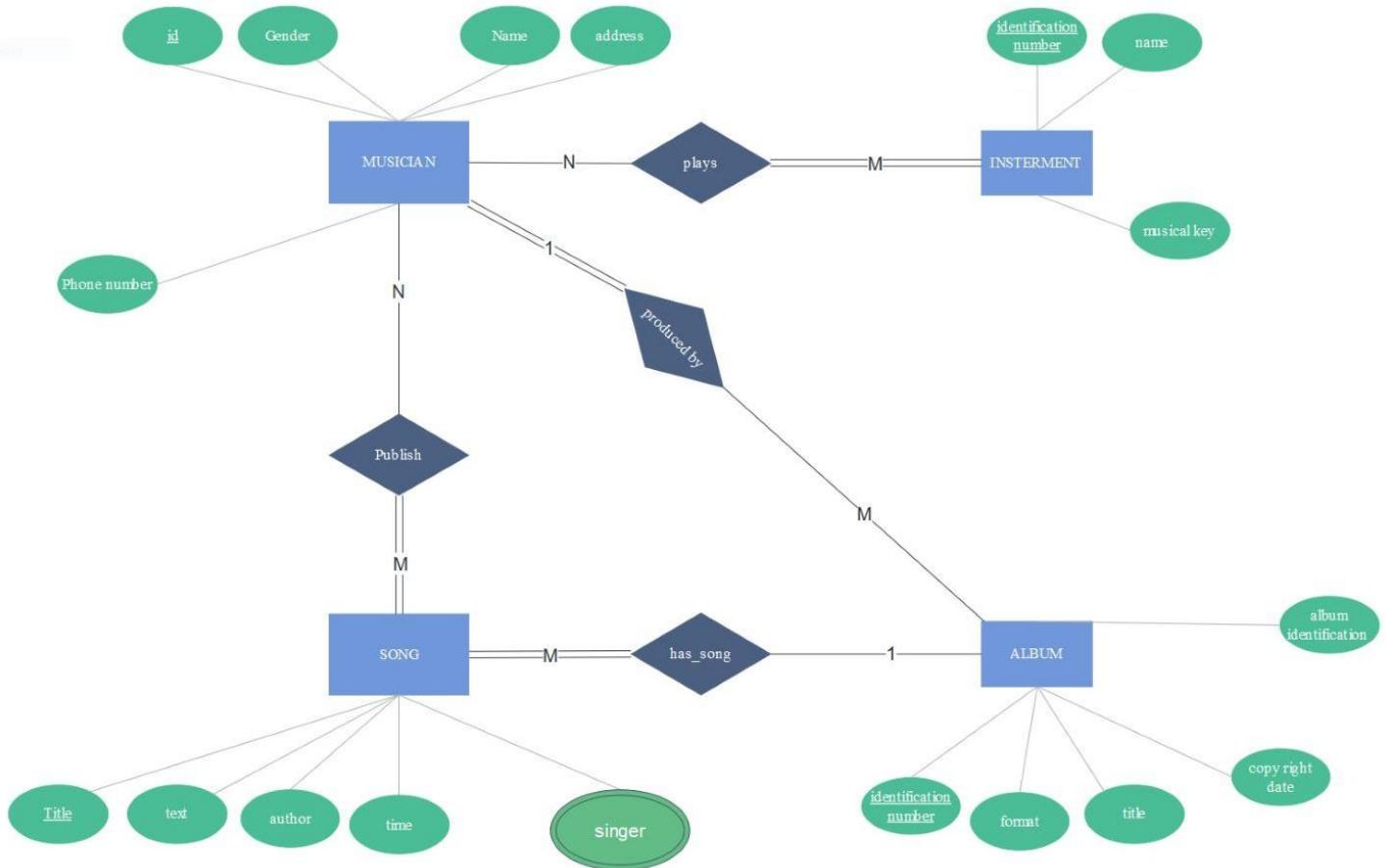
Spring 2022-2023

Database Description:

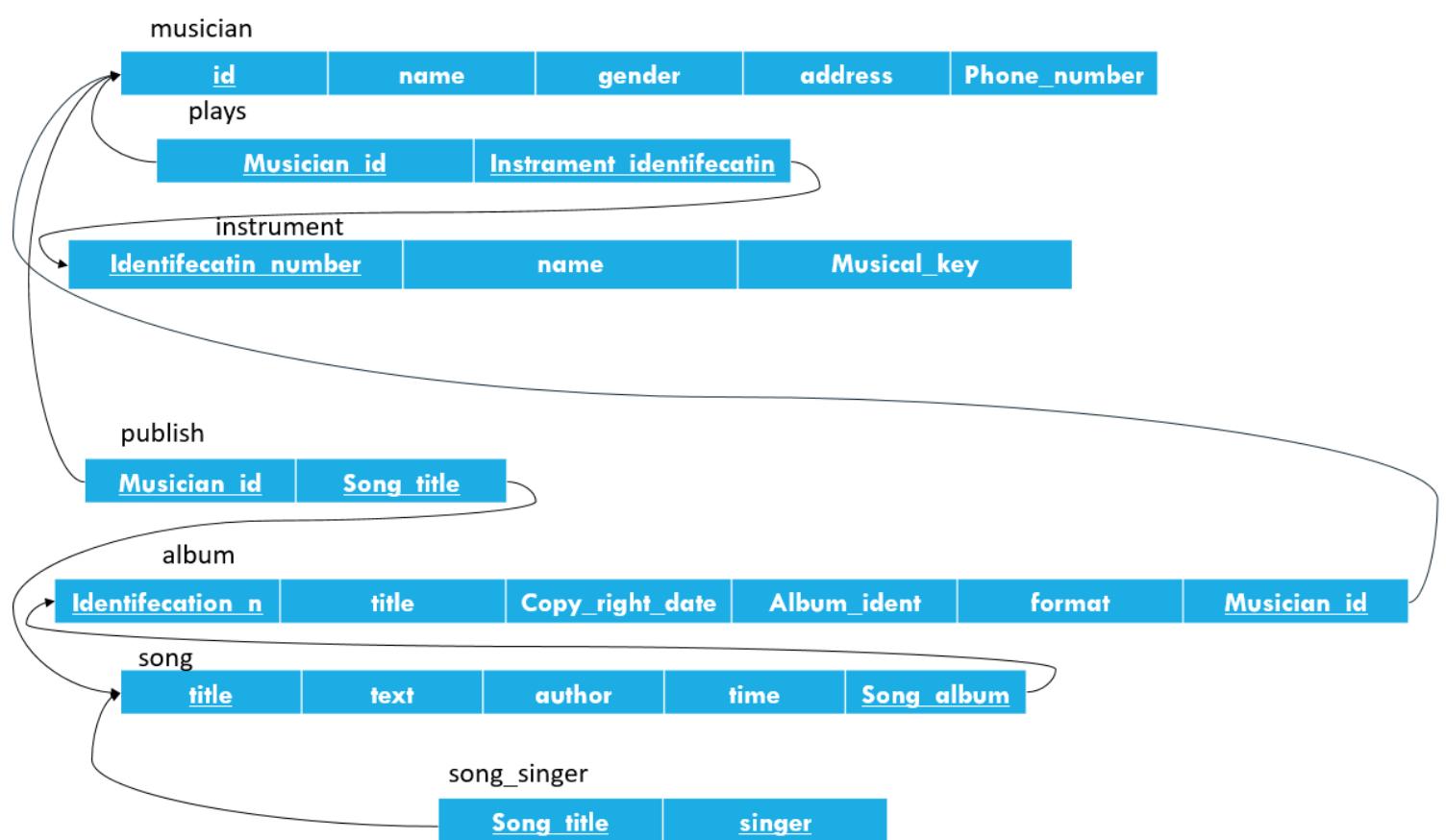
“Music Hub” has decided to store information about musicians who perform on its albums (as well as other company data) in a database. You as a database designer are asked to design a database for this company according to the bellow information gathered:

- Each musician that records at Music Hub has an ID#, a name, gender, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.
- Each instrument used in songs recorded at AMR has a unique identification number, a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).
- Each album recorded on the AMR label has a unique identification number, a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
- Each song recorded at AMR has a title and an author and a singer name or list of singers names, time (duration of the song), and song text.
- Each musician may play several instruments, and a given instrument may be played by several musicians.
- Each album has a number of songs on it, but no song may appear on more than one album.
- Each song is performed by one or more musicians, and a musician may perform a number of songs.
- Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

The ER Diagram:



ER mapping:



Create Tables:

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery2.sql - DESKTOP-RI2LPGT\SQLEXPRESS.MusicHub (DESKTOP-RI2LPGT\My PC (66))* - Microsoft SQL Server Management Studio". The Object Explorer on the left shows the "MusicHub" database selected. The central query window contains the following SQL code:

```
create table musician (id int, name varchar(25), gender Varchar(6), address varchar(40), phone_number int, primary key(id));  
create table instrument (identification_number int, name varchar(25), Musical_key varchar(40), primary key(identification_number));  
create table plays (musician_id int, instrument_identification_number int, primary key(musician_id, instrument_identification_number), foreign key(musician_id) references musician, foreign key(instrument_identification_number) references instrument );  
create table album (identification_number int, title varchar(25), copy_right_date date, format varchar(10), musician_id int primary key(identification_number), foreign key(musician_id) references musician);  
create table song (title varchar(25), text varchar(40), author varchar(30), time int, song_album int, primary key(title), foreign key(song_album) references album);  
create table song_singer (song_title varchar(25), singer varchar(25), primary key(song_title, singer), foreign key(song_title) references song);  
create table publish (m_id int, song_title varchar(25), primary key(m_id, song_title), foreign key(m_id) references musician , foreign key(song_title) references song);
```

The status bar at the bottom indicates "Ready", "Ln 27", "Col 42", "Ch 42", and "INS". The message pane shows "Commands completed successfully." and "Query executed successfully."

Data Insertion:

Musician Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The title bar reads "SQLQuery3.sql - DESKTOP-RI2LPGT\SQLEXPRESS.MusicHub (DESKTOP-RI2LPGT\My PC (63))* - Microsoft SQL Server Management Studio". The Object Explorer on the left shows the "MusicHub" database selected. The central query window contains the following SQL code:

```
insert into musician values (11111, 'Assi El Hallani', 'male', 'Lebanon', 70787545);  
insert into musician values (11112, 'Fairuz', 'female', 'Lebanon', 03565777);  
insert into musician values (11113, 'Ragheb Alama', 'male', 'Lebanon', 70787898);  
insert into musician values (11114, 'Haifa Wehbe', 'female', 'Lebanon', 78909654);  
insert into musician values (11115, 'Nancy Ajram', 'female', 'Lebanon', 03546987);  
insert into musician values (11116, 'Myriam Fares', 'female', 'Lebanon', 70999575);  
insert into musician values (11117, 'Tamer Hosny', 'male', 'Egypt', 1121900066);  
insert into musician values (11118, 'Shakira', 'female', 'Colombia', 131440198);  
insert into musician values (11119, 'Nicki Minaj', 'female', 'Trinidad and Tobago', 70785664);  
insert into musician values (11120, 'Maluma', 'male', 'Colombia', 70787545);  
insert into musician values (11121, 'Ziad Rahbani', 'male', 'Lebanon', 70799545);  
insert into musician values (11122, 'Adam Levine', 'male', 'USA', 74833333 );  
insert into musician values (11123, 'Jason Derulo', 'male', 'USA', 73677878);
```

The status bar at the bottom indicates "Ready", "Ln 13", "Col 26", "Ch 26", and "INS". The message pane shows multiple "1 row affected" messages and "Query executed successfully."

Instrument Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure, including the MusicHub database with its tables: album, instrument, musician, plays, publish, song, and song_singer. The central pane displays an SQL query window with the following code:

```
insert into instrument values (2000,'Piano','B-flat');
insert into instrument values (2001,'Piano','B-flat');
insert into instrument values (2002,'Guitar','E-flat');
insert into instrument values (2003,'Cello','C-flat');
insert into instrument values (2004,'Flute','A-flat');
insert into instrument values (2005,'Piano','C-flat');
insert into instrument values (2006,'violin','B-flat');
insert into instrument values (2007,'violin','D-sharp');
```

The Messages pane below the query window shows the results of the insert operations:

```
(1 row affected)
```

A status bar at the bottom indicates "Query executed successfully." and "0 rows".

Plays Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure, including the MusicHub database with its tables: album, instrument, musician, plays, publish, song, and song_singer. The central pane displays an SQL query window with the following code:

```
insert into plays values(11111,2005);
insert into plays values(11115,2000);
insert into plays values(11117,2003);
insert into plays values(11121,2001);
insert into plays values(11121,2004);
insert into plays values(11117,2006);
insert into plays values(11114,2002);
insert into plays values(11117,2002);
insert into plays values(11123,2007);
```

The Messages pane below the query window shows the results of the insert operations:

```
(1 row affected)
```

A status bar at the bottom indicates "Query executed successfully." and "0 rows".

Song Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a SQL script named 'SQLQuery3.sql' which inserts multiple rows into the 'song' table. The 'Messages' pane at the bottom shows three successful insert operations, each returning '(1 row affected)'. The status bar at the bottom right indicates '0 rows'.

```

SQLQuery3.sql - DESKTOP-RI2LPGT\My PC (63)* - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
MusicHub
Object Explorer
Connect ▾
DESKTOP-RI2LPGT\SQLEXPRESS (SQL)
  Databases
    System Databases
    Database Snapshots
  MusicHub
    Database Diagrams
    Tables
      System Tables
      FileTables
      External Tables
      Graph Tables
      dbo.album
      dbo.instrument
      dbo.musician
      dbo.plays
      dbo.publish
      dbo.song
      dbo.song_singer
    Views
    External Resources
    Synonyms
    Programmability
    Service Broker
    Storage
    Security
SQLQuery3.sql - DE...I2LPGT\My PC (63)* - SQLQuery2.sql - DE...I2LPGT\My PC (66)*
Insert into song values ( ' aihla kalam ' , ' HGT ' , ' Ali Moussa ' ,2 , 230 );
Insert into song values ( ' ayami ' , ' HGT ' , ' Ahmad Madi ' , 7 , 230 );
Insert into song values ( ' anti tani ' , ' HGT ' , ' Ahmad Madi ' , 1 , 230 );
Insert into song values ( ' ahsas jadid ' , ' LMN ' , ' Fares iskandar ' , 9 ,260 );
Insert into song values ( ' bialraha ' , ' LMN ' , ' Ahmad Alawi ' , 6 , 260 );
Insert into song values ( ' balsudfa ' , ' LMN ' , ' Ahmad Madi ' , 3 , 260 );
Insert into song values ( ' aldanya helwa ' , ' LMN ' , ' Ikram ElAssi ' , 4 , 260 );
Insert into song values('Aala_shanak','ABC','shady nour',5,270);
Insert into song values('ya_eid','ABC','shady noun',7,270);
Insert into song values ( ' mukanh wian ' , ' ZMN ' , ' Saud Sharbarly ' , 7 , 300 );
Insert into song values ( ' bitruh ' , ' ZMN ' , ' Marwan Khoury ' , 3 , 300 );
Insert into song values('tukoh_taka','ABC','Myriam Fares',4,300);
Insert into song values ( ' Hips dont lie ' , ' FES ' , ' jurje lala ' , 4 , 350 );
Insert into song values ( ' she wolf ' , ' FES ' , ' Nicki ' , 2 , 350 );
Insert into song values ( ' whenever, wherever ' , ' FES ' , ' Epic records ' , 8 , 360 );
Insert into song values('chantaje','ABC','Shakira',9,360);
Insert into song values ( ' Chun LI ' , ' BMR ' , ' young ' , 1,380 );
Insert into song values ( ' junio ' , ' ZIL ' , ' Maluma ' , 5 , 390 );
Insert into song values ( ' Noc come ' , ' ZIL ' , ' Maluma ' , 3 , 390 );
Insert into song values ( ' ya Zaman altaeifya ' , ' ZIL ' , ' Ziad Rahbani ' ,7 , 410 );
Insert into song values ( ' shu Hal eyam ' , ' ZIL ' , ' Ziad Rahbani ' , 5 , 420 );
Insert into song values ('lifestyle','fnf','Ziad Rahbani ',3,460);
91 %
Messages
(1 row affected)
(1 row affected)
(1 row affected)
91 %
Query executed successfully.
DESKTOP-RI2LPGT\SQLEXPRESS ... DESKTOP-RI2LPGT\My PC ... MusicHub | 00:00:00 0 rows
Ready Ln 36 Col 68 Ch 68 INS

```

Song Singer Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a SQL script named 'SQLQuery3.sql' which inserts multiple rows into the 'song_singer' table. The 'Messages' pane at the bottom shows three successful insert operations, each returning '(1 row affected)'. The status bar at the bottom right indicates '0 rows'.

```

SQLQuery3.sql - DESKTOP-RI2LPGT\SQLEXPRESS.MusicHub (DESKTOP-RI2LPGT\My PC (63)* - Microsoft SQL Server Management Studio
File Edit View Query Project Tools Window Help
MusicHub
Object Explorer
Connect ▾
DESKTOP-RI2LPGT\SQLEXPRESS (SQL)
  Databases
    System Databases
    Database Snapshots
  MusicHub
    Database Diagrams
    Tables
      System Tables
      FileTables
      External Tables
      Graph Tables
      dbo.album
      dbo.instrument
      dbo.musician
      dbo.plays
      dbo.publish
      dbo.song
      dbo.song_singer
    Views
    External Resources
    Synonyms
    Programmability
    Service Broker
    Storage
    Security
SQLQuery3.sql - DE...I2LPGT\My PC (63)* - SQLQuery2.sql - DE...I2LPGT\My PC (66)*
Insert into song_singer values('sawt_El_heda','Assi El Hallani');
Insert into song_singer values('40-50','Assi El Hallani');
Insert into song_singer values('tukoh_taka','Myriam Fares');
Insert into song_singer values('tukoh_taka','Nicki Minaj');
Insert into song_singer values('tukoh_taka','Maluma');
Insert into song_singer values('Aala_shanak','Nancy Ajram');
Insert into song_singer values('ya_eid','Nancy Ajram');
Insert into song_singer values('chantaje','shakira');
Insert into song_singer values('chantaje','maluma');
Insert into song_singer values ( ' tala aalyana ' , ' Assi El Hallani ' );
Insert into song_singer values ( ' dayan dum ' , ' Assi El Hallani ' );
Insert into song_singer values ( ' laylat hawa ' , ' Assi El Hallani ' );
Insert into song_singer values ( ' Beirut aam tabki ' , ' Assi El Hallani ' );
Insert into song_singer values ( ' albushta ' , ' Fairus ' );
Insert into song_singer values ( ' ya rayih ' , ' Fairus ' );
Insert into song_singer values ( ' nasan aalyana alhawa ' , ' Fairus ' );
Insert into song_singer values ( ' ana lihabibi ' , ' Fairus ' );
Insert into song_singer values ( ' ya tayer ' , ' Fairus ' );
Insert into song_singer values ( ' ana wyak ' , ' Ragheb Alama ' );
Insert into song_singer values ( ' alhubi alkabir ' , ' Ragheb Alama ' );
Insert into song_singer values ( ' ant ya ghali ' , ' Ragheb Alama ' );
Insert into song_singer values ( ' aihla kalam ' , ' Haifa Wehbe ' );
Insert into song_singer values ( ' ayami ' , ' Haifa Wehbe ' );
91 %
Messages
(1 row affected)
(1 row affected)
(1 row affected)
91 %
Query completed with errors.
DESKTOP-RI2LPGT\SQLEXPRESS ... DESKTOP-RI2LPGT\My PC ... MusicHub | 00:00:00 0 rows
Ready Ln 44 Col 56 Ch 56 INS

```

Album Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query window with the following SQL code:

```

Insert into album values( 230 , 'lama tal' , ' 2 / 19 / 2000 ' , ' DVD ' , 11114 ) ;
Insert into album values( 260 , ' ma bade ' , ' 10 / 9 / 2010 ' , ' CD ' , 11115 ) ;
Insert into album values( 270 , ' fahemt lahubi ' , ' 9 / 9 / 2009 ' , ' CD ' , 11115 ) ;
Insert into album values( 300 , ' shu halue lahyat ' , ' 1 / 8 / 2022 ' , ' CD ' , 11116 ) ;
Insert into album values( 330 , ' badei yak ' , ' 3 / 12 / 2000 ' , ' DVD ' , 11117 ) ;
Insert into album values( 350 , ' what is this ' , ' 2 / 7 / 2007 ' , ' CD ' , 11118 ) ;
Insert into album values( 360 , ' new love ' , ' 1 / 24 / 2015 ' , ' CD ' , 11118 ) ;
Insert into album values( 380 , ' how is death ' , ' 2 / 3 / 2020 ' , ' CD ' , 11119 ) ;
Insert into album values( 390 , ' history ' , ' 1 / 17 / 2010 ' , ' CD ' , 11120 ) ;
Insert into album values( 400 , ' do not come back ' , ' 6 / 9 / 2009 ' , ' CD ' , 11120 ) ;
Insert into album values( 410 , ' ya Zaman ' , ' 12 / 31 / 2000 ' , ' DVD ' , 11121 ) ;
Insert into album values( 420 , ' Beirut ' , ' 10 / 10 / 2001 ' , ' CD ' , 11121 ) ;
insert into album values(430,'hobbak nar','6/6/2006','mp3',11122);
insert into album values(460,'Tattoos','6/2/2006','mp4',11123);

```

The 'Messages' pane below the code shows the results of the execution:

- (1 row affected)

The status bar at the bottom indicates 'Query executed successfully.'

Publish Table:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query window with the following SQL code:

```

Insert into publish values ( 11121 , ' ya Zaman altaeifya ' ) ;
Insert into publish values ( 11121 , ' shu hal eyam ' ) ;
insert into publish values(11111,'sawt_El_heda');
insert into publish values(11111,'40-50');
insert into publish values(11119,'tukoh_taka');
insert into publish values(11120,'tukoh_taka');
insert into publish values(11116,'tukoh_taka');
insert into publish values(11115,'Aala_shanak');
insert into publish values(11115,'ya_eid');
insert into publish values(11118,'chantaje');
insert into publish values(11120,'chantaje');
Insert into publish values ( 11112 , ' ya tayer ' ) ;
Insert into publish values ( 11113 , ' ana wyak ' ) ;
Insert into publish values ( 11114 , ' anti tani ' ) ;
Insert into publish values ( 11115 , ' aldanya helwa ' ) ;
Insert into publish values ( 11116 , ' mukanh wian ' ) ;
Insert into publish values ( 11116 , ' bitruh ' ) ;
Insert into publish values ( 11123 , ' lifestyle' ) ;
Insert into publish values ( 11112 , 'Ahwak' );
insert into publish values (11118,'ahwak');
insert into publish values (11120,'ahwak');

```

The 'Messages' pane below the code shows the results of the execution:

- (1 row affected)
- (1 row affected)
- (1 row affected)
- (1 row affected)

The status bar at the bottom indicates 'Query completed with errors.'

Some Queries and their Execution:

1. For each musician, list the total number of albums

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query results grid titled 'Results'.

```
select name, count(Musician_id) as numberOfAlbums
from musician_album
where id=Musician_id
group by name;
```

name	numberOfAlbums
Adam Levine	1
Assi El Hallani	2
Fairuz	3
Haifa Wehbe	1
Jason Derulo	1
Maluma	2
Myriam Fares	1
Nancy Ajram	2
Nicki Minaj	1
Ragheb Alama	1
Shakira	2
Tamer Hosny	1
Ziad Rahbani	2

Query executed successfully. DESKTOP-RI2LPGT\SQLEXPRESS ... DESKTOP-RI2LPGT\My PC ... MusicHub 00:00:00 13 rows

2. Find the musicians who have played more than 2 instruments:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query results grid titled 'Results'.

```
SELECT musician.name
FROM musician
JOIN plays ON musician.id = plays.musician_id
GROUP BY musician.name
HAVING COUNT(plays.instrument_identification_number) >= 2;
```

name
Tamer Hosny
Ziad Rahbani

Query executed successfully. DESKTOP-RI2LPGT\SQLEXPRESS ... DESKTOP-RI2LPGT\My PC ... MusicHub 00:00:00 2 rows

3. Find the total number of songs:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. In the center, a query window displays the following SQL code:

```
select count(*) as numberOfSongs
from song;
```

The results pane shows a single row with the value 36 under the column 'numberOfSongs'.

At the bottom, a status bar indicates 'Query executed successfully.' and other details like 'Ln 2' and 'Col 11'.

4. Find for each album, find the total number of songs:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. In the center, a query window displays the following SQL code:

```
select album.title ,count(song.album)
from album,song
where identification_number=song.album
group by album.title;
```

The results pane shows a table with two columns: 'title' and '(No column name)'. The data is as follows:

title	(No column name)
Ahlam	4
Beirut	1
fahemt lahubi	2
ghayeb	2
history	2
how is death	1
lama tal	3
ma bade	4
new love	2
Nour	2
Remia	1
shu halue lahyat	3
what is this	2
ya habibi	3
ya Zaman	1
Ziad	2
Tattoos	1

At the bottom, a status bar indicates 'Query executed successfully.' and other details like 'Ln 4' and 'Col 22'.

5. Find for the Song “chantaje” give the name of the musician:

The screenshot shows the Microsoft SQL Server Management Studio interface. In the Object Explorer, the 'MusicHub' database is selected. In the center pane, a query window displays the following SQL code:

```
select name
from musician,publish
where song_title='chantaje' AND id=id;
```

The results pane shows the following data:

name
Shakira
Maluma

Below the results, a message indicates "Query executed successfully." and shows the execution details: Line 3, Column 41, Ch 41, INS, and 2 rows.

6. List only the songs with at least 2 musician singing:

The screenshot shows the Microsoft SQL Server Management Studio interface. In the Object Explorer, the 'MusicHub' database is selected. In the center pane, a query window displays the following SQL code:

```
select title
from song
where(select count(*)
      from song_singer
      where title=song_title)>=2;
```

The results pane shows the following data:

title
chantaje
lifestyle
tukoh_taka

Below the results, a message indicates "Query executed successfully." and shows the execution details: Line 5, Column 28, Ch 28, and 3 rows.

7. List the name of the producer having the highest number of albums

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a complex SQL query:

```
SELECT m.name
FROM musician m
WHERE m.id = (
    SELECT a.musician_id
    FROM album a
    GROUP BY a.musician_id
    HAVING COUNT(*) = (
        SELECT MAX(album_count)
        FROM (
            SELECT COUNT(*) AS album_count
            FROM album
            GROUP BY musician_id
        ) AS subquery
    )
);
```

The results pane shows a single row with the name 'Fairuz'.

Query executed successfully.

8. Find the albums that were published after the year 2006 and have the format "CD":

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query:

```
SELECT title
FROM album
WHERE copy_right_date > '1/1/2006'
intersect
select title
from album where format=' CD'
```

The results pane shows a list of 11 album titles:

title
do not come back
fahemt lahabi
history
how is death
ma bade
new love
Nour
Remia
shu halue lahyat
what is this
ya habibi

Query executed successfully.

9. Find the musicians who have played instruments in the key of "A-flat" and are male:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query window with the following SQL code:

```
SELECT name
FROM musician
WHERE id IN (
    SELECT musician_id
    FROM plays
    WHERE instrument_identification_number IN (
        SELECT identification_number
        FROM instrument
        WHERE Musical_key = 'A-flat'
    )
) AND gender = 'Male';
```

The results pane shows a single row with the name 'Ziad Rahbani'.

Query executed successfully.

name
Ziad Rahbani

Ln 9 Col 36 Ch 36 INS

10. Find the songs that have a duration longer than 5 minutes:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query window with the following SQL code:

```
SELECT title
FROM song
WHERE time > 5;
```

The results pane shows a list of song titles:

title
ahsas jadid
albusta
ana ilhabibi
ana wyak
ayami
Beirut aam tabki
bialraha
mukanh wian
whenever, wherever
ya rayih
ya tayer
ya Zaman altaifiya
chantaje
ya_eid

Query executed successfully.

Ln 3 Col 16 Ch 16 INS

11. Find the musicians who have played instruments and also published songs:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query window with the following SQL code:

```
SELECT distinct musician.name
FROM musician
JOIN plays ON musician.id = plays.musician_id
JOIN publish ON musician.id = publish.musician_id;
```

The results pane shows the names of five musicians who meet the criteria:

name
1 Assi El Hallani
2 Haifa Wehbe
3 Jason Derulo
4 Nancy Ajram
5 Ziad Rahbani

At the bottom, a message indicates "Query executed successfully."

12. Find the albums with more than 2 songs:

The screenshot shows the Microsoft SQL Server Management Studio interface. The Object Explorer on the left shows the database structure for 'MusicHub'. The central pane displays a query window with the following SQL code:

```
SELECT album.title
FROM album
JOIN song ON album.identification_number = song.song_album
GROUP BY album.title
HAVING COUNT(song.title) >= 3;
```

The results pane shows the titles of five albums that contain at least 3 songs:

title
1 Ahlam
2 lama tal
3 ma bade
4 shu halie lahyat
5 ya habebi

At the bottom, a message indicates "Query executed successfully."