```sql
Create database temp;
use temp;

-- Create the Artists table
CREATE TABLE Artists (
ArtistID INT PRIMARY KEY,
Name VARCHAR(255) NOT NULL,
Biography TEXT,
Nationality VARCHAR(100));

-- Create the Categories table
CREATE TABLE Categories (
CategoryID INT PRIMARY KEY,
Name VARCHAR(100) NOT NULL);

-- Create the Artworks table
CREATE TABLE Artworks (
ArtworkID INT PRIMARY KEY,
Title VARCHAR(255) NOT NULL,
ArtistID INT,
CategoryID INT,
Year INT,
Description TEXT,
ImageURL VARCHAR(255),
FOREIGN KEY (ArtistID) REFERENCES Artists (ArtistID),
FOREIGN KEY (CategoryID) REFERENCES Categories (CategoryID));

-- Create the Exhibitions table

CREATE TABLE Exhibitions (
ExhibitionID INT PRIMARY KEY,
Title VARCHAR(255) NOT NULL,
StartDate DATE,
EndDate DATE,
Description TEXT);

-- Create a table to associate artworks with exhibitions

CREATE TABLE ExhibitionArtworks (
ExhibitionID INT,
ArtworkID INT,
PRIMARY KEY (ExhibitionID, ArtworkID),
FOREIGN KEY (ExhibitionID) REFERENCES Exhibitions (ExhibitionID),
FOREIGN KEY (ArtworkID) REFERENCES Artworks (ArtworkID));


-- Insert sample data into the Artists table
```

INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES
(1, 'Pablo Picasso', 'Renowned Spanish painter and sculptor.', 'Spanish'),
(2, 'Vincent van Gogh', 'Dutch post-impressionist painter.', 'Dutch'),
(3, 'Leonardo da Vinci', 'Italian polymath of the Renaissance.', 'Italian');

-- Insert sample data into the Categories table

INSERT INTO Categories (CategoryID, Name) VALUES
(1, 'Painting'),
(2, 'Sculpture'),
(3, 'Photography');

-- Insert sample data into the Artworks table

INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
(1, 'Starry Night', 2, 1, 1889, 'A famous painting by Vincent van Gogh.', 'starry_night.jpg'),
(2, 'Mona Lisa', 3, 1, 1503, 'The iconic portrait by Leonardo da Vinci.', 'mona_lisa.jpg'),
(3, 'Guernica', 1, 1, 1937, 'Pablo Picasso\'s powerful anti-war mural.', 'guernica.jpg');

-- Insert sample data into the Exhibitions table
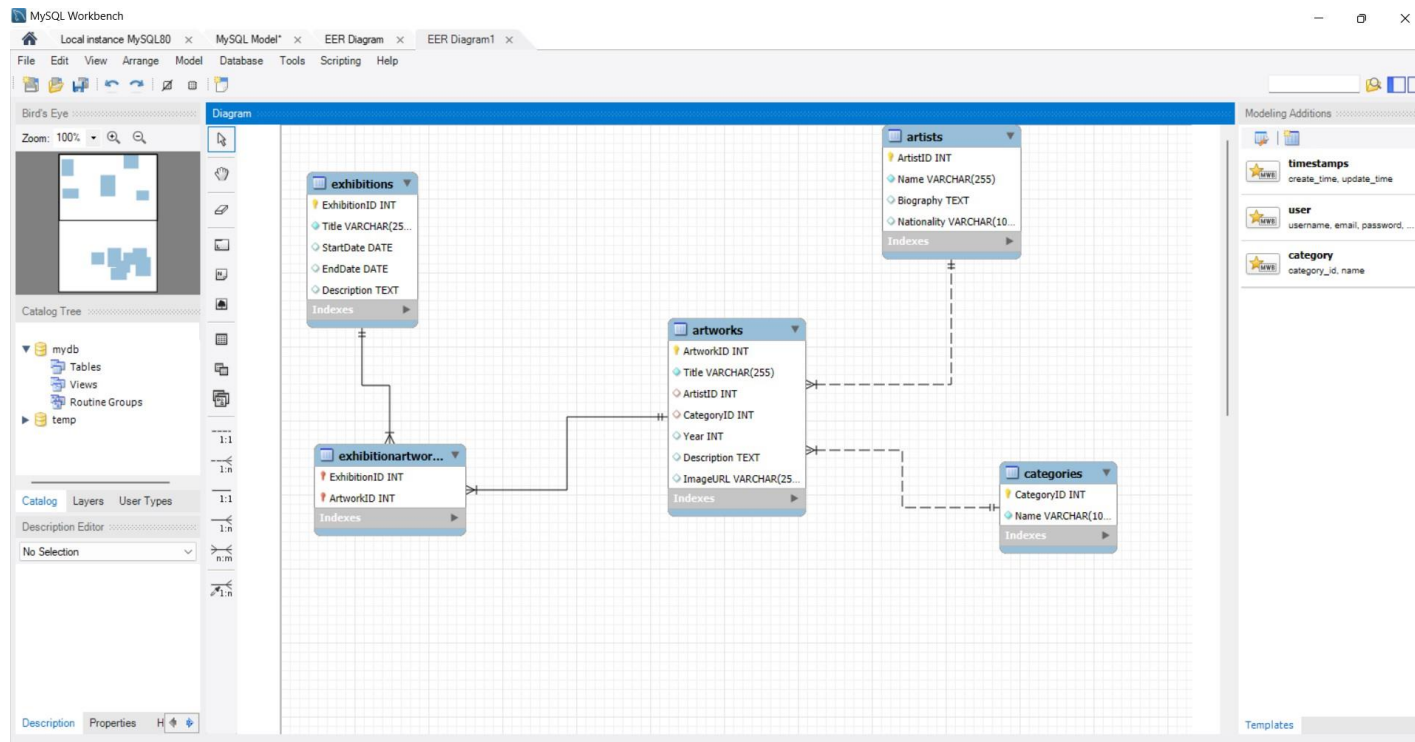
INSERT INTO Exhibitions (ExhibitionID, Title, StartDate, EndDate, Description) VALUES
(1, 'Modern Art Masterpieces', '2023-01-01', '2023-03-01', 'A collection of modern art masterpieces.'),
(2, 'Renaissance Art', '2023-04-01', '2023-06-01', 'A showcase of Renaissance art treasures.');

-- Insert artworks into exhibitions

INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES
(1, 1),
(1, 2),
(1, 3),
(2, 2);

15. List the categories with the average year of artworks they contain, only for categories with more than 1 artwork

ER Diagram

Artists Table

Categories Table

```
65 •   select * from Categories;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

	CategoryID	Name
▶	1	Painting
	2	Sculpture
	3	Photography
*	NULL	NULL

Categories 4 ×

Apply   Revert

Artworks Table

```
65 •   select * from Artworks;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

	ArtworkID	Title	ArtistID	CategoryID	Year	Description	ImageURL
▶	1	Starry Night	2	1	1889	A famous painting by Vincent van Gogh.	starry_night.jpg
	2	Mona Lisa	3	1	1503	The icon The iconic portrait by Leonardo da Vinci.	pg
	3	Guernica	1	1	1937	Pablo Picasso's powerful anti-war mural.	guernica.jpg
*	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Exhibitions Table

```
65 •   select * from Exhibitions;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

	ExhibitionID	Title	StartDate	EndDate	Description
▶	1	Modern Art Masterpieces	2023-01-01	2023-03-01	A collection of modern art masterpieces.
	2	Renaissance Art	2023-04-01	2023-06-01	A showcase of Renaissance art treasures.
*	NULL	NULL	NULL	NULL	NULL

Exhibitions 6 ×

Apply   Revert

ExhibitionArtworks Table

```
65 •   select * from ExhibitionArtworks;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

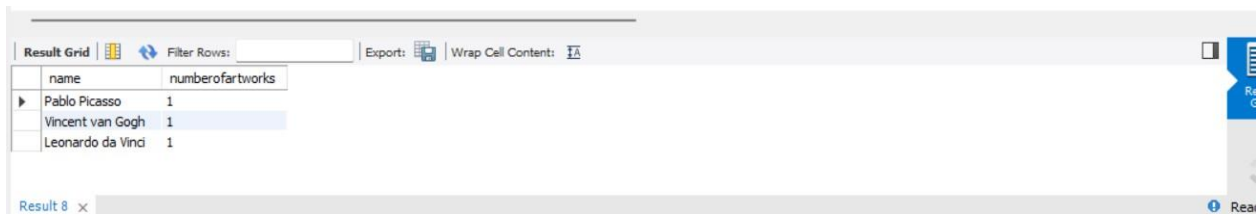|	ExhibitionID	ArtworkID
▶	1	1
	1	2
	2	2
	1	3
*	NULL	NULL

ExhibitionArtworks 7 ×

Apply   Revert

Solving Queries Step by Step

1. Retrieve the names of all artists along with the number of artworks they have in the gallery, and list them in descending order of the number of artworks.

```
SELECT a.Name, COUNT(art.ArtworkID) AS ArtworkCount
FROM Artists a
JOIN Artworks art ON a.ArtistID = art.ArtistID
GROUP BY a.Name
ORDER BY ArtworkCount DESC;
```

name	numberofartworks
Pablo Picasso	1
Vincent van Gogh	1
Leonardo da Vinci	1

Result 8 ✕

2. List the titles of artworks created by artists from 'Spanish' and 'Dutch' nationalities, and order them by the year in ascending order.

```
SELECT art.Title
FROM Artworks art
JOIN Artists a ON art.ArtistID = a.ArtistID
WHERE a.Nationality IN ('Spanish', 'Dutch')
ORDER BY art.Year ASC;
```

Title
Starry Night
Guernica

Result 10 ✕

3. Find the names of all artists who have artworks in the 'Painting' category, and the number of artworks they have in this category.

```sql
SELECT a.Name, COUNT(art.ArtworkID) AS ArtworkCount
FROM Artists a
JOIN Artworks art ON a.ArtistID = art.ArtistID
JOIN Categories c ON art.CategoryID = c.CategoryID
WHERE c.Name = 'Painting'
GROUP BY a.Name;
```

name	numberofartworks
Pablo Picasso	1
Vincent van Gogh	1
Leonardo da Vinci	1

4. List the names of artworks from the 'Modern Art Masterpieces' exhibition, along with their artists and categories.

```sql
SELECT art.Title, a.Name AS ArtistName, c.Name AS CategoryName
FROM Artworks art
JOIN Artists a ON art.ArtistID = a.ArtistID
JOIN Categories c ON art.CategoryID = c.CategoryID
JOIN ExhibitionArtworks ea ON art.ArtworkID = ea.ArtworkID
JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID
WHERE e.Title = 'Modern Art Masterpieces';
```

5. Find the Artists who have more than two Artworks in the gallery.
– no 2 artworks

```
SELECT a.Name, COUNT(art.ArtworkID) AS ArtworkCount
FROM Artists a
JOIN Artworks art ON a.ArtistID = art.ArtistID
GROUP BY a.Name
HAVING COUNT(art.ArtworkID) > 2;
```

6. Find the titles of artworks that were exhibited in both 'Modern Art Masterpieces' and 'Renaissance Art' exhibitions

```
SELECT art.Title
FROM Artworks art
JOIN ExhibitionArtworks ea1 ON art.ArtworkID = ea1.ArtworkID
JOIN Exhibitions e1 ON ea1.ExhibitionID = e1.ExhibitionID
JOIN ExhibitionArtworks ea2 ON art.ArtworkID = ea2.ArtworkID
JOIN Exhibitions e2 ON ea2.ExhibitionID = e2.ExhibitionID
WHERE e1.Title = 'Modern Art Masterpieces'
AND e2.Title = 'Renaissance Art';
```

7. Find the total number of artworks in each category

```
SELECT c.Name AS CategoryName, COUNT(art.ArtworkID) AS TotalArtworks
FROM Categories c
JOIN Artworks art ON c.CategoryID = art.CategoryID
GROUP BY c.Name;
```

name	TotalArtworks
▶ Painting	3

8. List artists who have more than 3 artworks in the gallery.
– no one have more than 3 artwork

SELECT a.Name, COUNT(art.ArtworkID) AS ArtworkCount
FROM Artists a
JOIN Artworks art ON a.ArtistID = art.ArtistID
GROUP BY a.Name
HAVING COUNT(art.ArtworkID) > 3;

9. Find the artworks created by artists from a specific nationality (e.g., Spanish).

select ar.Title
from artworks ar
join artists a on ar.artistID = a.artistID
where a.Nationality = 'Spanish';

Title
▶ Guernica

10. List exhibitions that feature artwork by both Vincent van Gogh and Leonardo da Vinci.

select e.Title
from Exhibitions e
join ExhibitionArtworks ea on e.ExhibitionID = ea.ExhibitionID
join Artworks ar on ea.ArtworkID = ar.ArtworkID
join Artists a on ar.ArtistID = a.ArtistID
where a.name in ('Vincent van Gogh', 'Leonardo da Vinci')
group by e.Title
having count(distinct a.ArtistID) = 2;

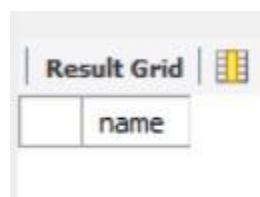11. Find all the artworks that have not been included in any exhibition.
select ar.Title
from Artworks ar
left join ExhibitionArtWorks ea on ar.artworkID = ea.artworkID
where ea.ExhibitionID is null;

Result Grid | Filter Rows:

Title

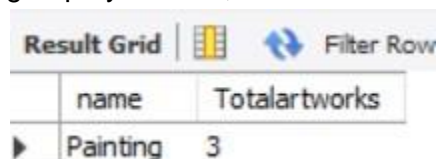12. List artists who have created artworks in all available categories.
select a.name
from Artists a
join Artworks ar on a.ArtistID = ar.ArtistID
join Categories c on ar.CategoryID = c.CategoryID
group by a.name
having count(distinct ar.CategoryID) = (SELECT count(*) from Categories);

Result Grid

name

13. List the total number of artworks in each category.

select c.name,count(ar.ArtworkID) as Totalartworks
from Categories c
join Artworks ar on c.CategoryID=ar.CategoryID
group by c.name;

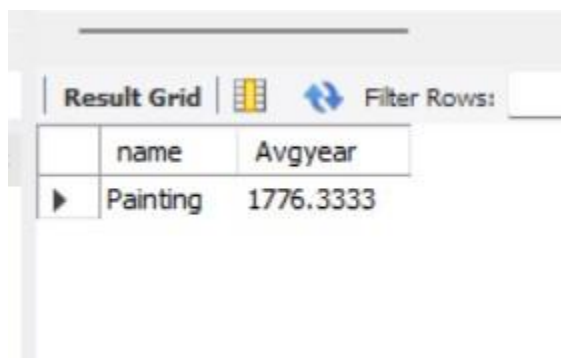Result Grid | Filter Row

name	Totalartworks
Painting	3

14. Find the artists who have more than 2 artworks in the gallery.
 – -
select a.name
from Artists a
join Artworks ar ON a.ArtistID = ar.ArtistID
group by a.name
having count(ar.ArtworkID)>2;

15. List the categories with the average year of artworks they contain, only for categories with more than 1 artwork

Query -
Select c.name,avg(ar.year) as Avgyear
From Categories c
Join Artworks ar on c.CategoryID = ar.CategoryID
Group by c.name
Having count(ar.ArtworkId) > 1;

Result Grid	Filter Rows:	
name	Avgyear
▶ Painting	1776.3333

16. Find the artworks that were exhibited in the 'Modern Art Masterpieces' exhibition.

select ar.Title
from Artworks ar
join ExhibitionArtworks ea on ar.ArtworkID = ea.ArtworkID
Join Exhibitions e on ea.ExhibitionID = e.ExhibitionID
where e.Title = 'Modern Art Masterpieces';

```
172        from Artwo
```

	Title
▶	Starry Night
	Mona Lisa
	Guernica

17. Find the categories where the average year of artworks is greater than the average year of all artworks.
WITH AvgYearAll AS (SELECT AVG(Year) AS AvgYear FROM Artworks)
SELECT c.Name
FROM Categories c
JOIN Artworks ar ON c.CategoryID = ar.CategoryID
GROUP BY c.Name
HAVING AVG(ar.Year) > (SELECT AvgYear FROM AvgYearAll);

	Name
▶	Painting

18. List the artworks that were not exhibited in any exhibition.

```
select ar.Title
from Artworks ar
left join ExhibitionArtworks ea on ar.ArtworkID = ea.ArtworkID
where ea.ExhibitionID is null;
```
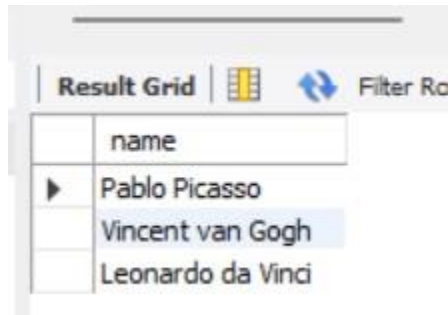
Title

19. Show artists who have artworks in the same category as "Mona Lisa."

```
select a.name
from Artists a
join Artworks ar on a.ArtistID=ar.ArtistID
where ar.CategoryID = (
select CategoryID
from Artworks
where Title = 'Mona Lisa');
```

name
Pablo Picasso
Vincent van Gogh
Leonardo da Vinci

20. List the names of artists and the number of artworks they have in the gallery.

```
select a.name,count(ar.ArtworkID) as numberofartworks
from Artists a
join Artworks ar on a.ArtistID = ar.ArtistID
group by a.name;
```

name	numberofartworks
Pablo Picasso	1
Vincent van Gogh	1
Leonardo da Vinci	1