

CODING CHALLENGE SQL

VIRTUAL ART GALLERY SCHEMA (DDL AND DML)

I. Creating A Database Schema:

QUERY: CREATE DATABASE VirtualArtGallery;

```
MySQL localhost:3306 ssl SQL > CREATE DATABASE VirtualArtGallery;
Query OK, 1 row affected (0.0162 sec)
MySQL localhost:3306 ssl SQL > show databases
-> ;

+-----+
| Database |
+-----+
| couriermanagementdb |
| db |
| information_schema |
| mysql |
| performance_schema |
| sys |
| visualartgallery |
+-----+
7 rows in set (0.0039 sec)
```

II. Creating Tables

Artists Table:

QUERY: CREATE TABLE Artists(ArtistID INT PRIMARY KEY, Name VARCHAR(255) NOT NULL, Biography TEXT, Nationality VARCHAR(100));

```
MySQL localhost:3306 ssl visualartgallery SQL > CREATE TABLE Artists( ArtistID INT PRIMARY KEY, Name VARCHAR(255) NOT NULL,
-> Biography TEXT, Nationality VARCHAR(100));
Query OK, 0 rows affected (0.0566 sec)
MySQL localhost:3306 ssl visualartgallery SQL > DESC Artists;

+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| ArtistID | int | NO | PRI | NULL | |
| Name | varchar(255) | NO | | NULL | |
| Biography | text | YES | | NULL | |
| Nationality | varchar(100) | YES | | NULL | |
+-----+
4 rows in set (0.0073 sec)
```

Categories Table:

QUERY: CREATE TABLE Categories(CategoryID INT PRIMARY KEY, Name VARCHAR(100) NOT NULL);

```
MySQL localhost:3306 ssl visualartgallery SQL > CREATE TABLE Categories( CategoryID INT PRIMARY KEY,
-> Name VARCHAR(100) NOT NULL);
Query OK, 0 rows affected (0.0214 sec)
MySQL localhost:3306 ssl visualartgallery SQL > DESC Categories;

+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| CategoryID | int | NO | PRI | NULL | |
| Name | varchar(100) | NO | | NULL | |
+-----+
2 rows in set (0.0044 sec)
```

Artworks Table:

QUERY: 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));

```
MySQL localhost:3306 ssl visualartgallery SQL > 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));

Query OK, 0 rows affected (0.0631 sec)

MySQL localhost:3306 ssl visualartgallery SQL > desc Artworks;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ArtworkID  | int       | NO   | PRI | NULL    |       |
| Title      | varchar(255) | NO   |     | NULL    |       |
| ArtistID   | int       | YES  | MUL | NULL    |       |
| CategoryID | int       | YES  | MUL | NULL    |       |
| Year       | int       | YES  |     | NULL    |       |
| Description | text      | YES  |     | NULL    |       |
| ImageURL   | varchar(255) | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
7 rows in set (0.0065 sec)
```

Exhibition Table:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > CREATE TABLE Exhibitions( ExhibitionID INT PRIMARY KEY,
-> Title VARCHAR(255) NOT NULL, StartDate DATE,
-> EndDate DATE, Description TEXT);

Query OK, 0 rows affected (0.0221 sec)

MySQL localhost:3306 ssl visualartgallery SQL > DESC EXHIBITIONS;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ExhibitionID | int       | NO   | PRI | NULL    |       |
| Title      | varchar(255) | NO   |     | NULL    |       |
| StartDate   | date      | YES  |     | NULL    |       |
| EndDate     | date      | YES  |     | NULL    |       |
| Description  | text      | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.0045 sec)
```

ExhibitionArtwork Table:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > CREATE TABLE ExhibitionArtworks(ExhibitionID INT,
-> ArtworkID INT,
-> PRIMARY KEY(ExhibitionID,ArtworkID),
-> FOREIGN KEY (ExhibitionID) REFERENCES Exhibitions(ExhibitionID),
-> FOREIGN KEY (ArtworkID) REFERENCES Artworks(ArtworkID));

Query OK, 0 rows affected (0.0580 sec)

MySQL localhost:3306 ssl visualartgallery SQL > desc exhibitionartworks;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| ExhibitionID | int       | NO   | PRI | NULL    |       |
| ArtworkID    | int       | NO   | PRI | NULL    |       |
+-----+-----+-----+-----+-----+-----+
2 rows in set (0.0028 sec)
```

III. Inserting the Values

Artists Table:

```
MySQL localhost:3306 ssl visualartgallery SQL > INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES
-> (1, 'Pablo Picasso', 'Renowned Spanish painter and sculptor.', 'Spanish'),
-> (3, 'Leonardo da Vinci', 'Italian polymath of the Renaissance.', 'Italian'),
-> (4, 'Alfredo Disousa', 'Mexican painter known for self-portraits.', 'Mexican'),
-> (5, 'Andrew Wilson', 'American pop artist.', 'American'),
-> (6, 'Claude Monet', 'Italian impressionist painter.', 'Italian');

Query OK, 5 rows affected (0.0068 sec)

Records: 5 Duplicates: 0 Warnings: 0
MySQL localhost:3306 ssl visualartgallery SQL > select * from artists;
```

| ArtistID | Name | Biography | Nationality |
|----------|-------------------|---|-------------|
| 1 | Pablo Picasso | Renowned Spanish painter and sculptor. | Spanish |
| 3 | Leonardo da Vinci | Italian polymath of the Renaissance. | Italian |
| 4 | Alfredo Disousa | Mexican painter known for self-portraits. | Mexican |
| 5 | Andrew Wilson | American pop artist. | American |
| 6 | Claude Monet | Italian impressionist painter. | Italian |

5 rows in set (0.0017 sec)

Categories Table:

```
MySQL localhost:3306 ssl visualartgallery SQL > INSERT INTO Categories (CategoryID, Name) VALUES
-> (1, 'Painting'), (2, 'Sculpture'), (3, 'Photography'),
-> (4, 'Digital Art'), (5, 'Mixed Media');

Query OK, 5 rows affected (0.0069 sec)

Records: 5 Duplicates: 0 Warnings: 0
MySQL localhost:3306 ssl visualartgallery SQL > select * from categories;
```

| CategoryID | Name |
|------------|-------------|
| 1 | Painting |
| 2 | Sculpture |
| 3 | Photography |
| 4 | Digital Art |
| 5 | Mixed Media |

5 rows in set (0.0007 sec)

Artworks Table:

```
MySQL localhost:3306 ssl visualartgallery SQL > 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'),
-> (4, 'The Two Fridas', 4, 1, 1939, 'A double self-portrait.', 'two_fridas.jpg'),
-> (5, 'Campbell's Soup Cans', 5, 4, 1962, 'Iconic pop art series.', 'soup_cans.jpg'),
-> (6, 'Water Lilies', 6, 1, 1906, 'Impressionist water garden scene.', 'water_lilies.jpg'),
-> (7, 'Self-Portrait', 2, 3, 1887, 'Van Gogh's self-portrait.', 'vangogh_self.jpg'),
-> (8, 'Digital Dreams', 5, 4, 2020, 'A modern take on reality.', 'digital_dreams.jpg'),
-> (9, 'Hybrid Forms', 1, 5, 1940, 'Abstract composition.', 'hybrid_forms.jpg'),
-> (10, 'Sunflowers', 2, 1, 1888, 'Van Gogh's floral series.', 'sunflowers.jpg');

Query OK, 10 rows affected (0.0034 sec)

Records: 10 Duplicates: 0 Warnings: 0
MySQL localhost:3306 ssl visualartgallery SQL > select * from artworks;
```

| 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 iconic portrait by Leonardo da Vinci. | mona_lisa.jpg |
| 3 | Guernica | 1 | 1 | 1937 | Pablo Picasso's powerful anti-war mural. | guernica.jpg |
| 4 | The Two Fridas | 4 | 1 | 1939 | A double self-portrait. | two_fridas.jpg |
| 5 | Campbell's Soup Cans | 5 | 4 | 1962 | Iconic pop art series. | soup_cans.jpg |
| 6 | Water Lilies | 6 | 1 | 1906 | Impressionist water garden scene. | water_lilies.jpg |
| 7 | Self-Portrait | 2 | 3 | 1887 | Van Gogh's self-portrait. | vangogh_self.jpg |
| 8 | Digital Dreams | 5 | 4 | 2020 | A modern take on reality. | digital_dreams.jpg |
| 9 | Hybrid Forms | 1 | 5 | 1940 | Abstract composition. | hybrid_forms.jpg |
| 10 | Sunflowers | 2 | 1 | 1888 | Van Gogh's floral series. | sunflowers.jpg |

10 rows in set (0.0016 sec)

Exhibition Table:

```
MySQL localhost:3306 ssl visualartgallery SQL> 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. '),
-> (3, 'Women in Art', '2023-07-01', '2023-09-01', 'Celebrating female artists. '),
-> (4, 'Pop & Digital Explosion', '2023-10-01', '2023-12-01', 'Pop meets modern digital expression. ');

Query OK, 4 rows affected (0.0068 sec)

Records: 4 Duplicates: 0 Warnings: 0
MySQL localhost:3306 ssl visualartgallery SQL> select * from exhibitions;
+-----+-----+-----+-----+-----+
| 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. |
| 3 | Women in Art | 2023-07-01 | 2023-09-01 | Celebrating female artists. |
| 4 | Pop & Digital Explosion | 2023-10-01 | 2023-12-01 | Pop meets modern digital expression. |
+-----+-----+-----+-----+-----+
4 rows in set (0.0008 sec)
```

ExhibitionArtwork Table:

```
MySQL localhost:3306 ssl visualartgallery SQL> INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES
-> (1, 1),(1, 2),(1, 3),(2, 2),(1, 5),(1, 9),(2, 6),(3, 4),(3, 6),(4, 5),(4, 8);

Query OK, 11 rows affected (0.0099 sec)

Records: 11 Duplicates: 0 Warnings: 0
MySQL localhost:3306 ssl visualartgallery SQL> select * from ExhibitionArtworks;
+-----+-----+
| ExhibitionID | ArtworkID |
+-----+-----+
| 1 | 1 |
| 1 | 2 |
| 2 | 2 |
| 1 | 3 |
| 3 | 4 |
| 1 | 5 |
| 4 | 5 |
| 2 | 6 |
| 3 | 6 |
| 4 | 8 |
| 1 | 9 |
+-----+-----+
11 rows in set (0.0008 sec)
```

Solve the below queries:

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.

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL> /* ques-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.*/
MySQL localhost:3306 ssl visualartgallery SQL> SELECT a.Name,COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists a
-> JOIN Artworks aw ON a.ArtistID=aw.ArtistID GROUP BY a.Name
-> ORDER BY ArtworkCount DESC;
+-----+-----+
| Name | ArtworkCount |
+-----+-----+
| Vincent van Gogh | 3 |
| Pablo Picasso | 2 |
| Andrew Wilson | 2 |
| Leonardo da Vinci | 1 |
| Alfredo Disousa | 1 |
| Claude Monet | 1 |
+-----+-----+
6 rows in set (0.0034 sec)
```

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

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL> /* ques-2 List the titles of artworks created by artists from 'Spanish' and 'Dutch' nationalities, and order them by t
he year in ascending order*/
MySQL localhost:3306 ssl visualartgallery SQL> SELECT ar.Title FROM Artworks ar JOIN Artists a ON ar.ArtistID = a.ArtistID
-> WHERE a.Nationality IN ('Spanish', 'Dutch') ORDER BY ar.Year ASC;
+-----+
| Title |
+-----+
| Self-Portrait |
| Sunflowers |
| Starry Night |
| Guernica |
| Hybrid Forms |
+-----+
5 rows in set (0.0035 sec)
```

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

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the names of all artists who have artworks in the 'Painting' category, and the number of artworks they have in this category*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name, COUNT(aw.ArtworkID) AS PaintingCount FROM Artists a
-> JOIN Artworks aw ON a.ArtistID = aw.ArtistID JOIN
-> Categories c ON aw.CategoryID = c.CategoryID
-> WHERE c.Name = 'Painting' GROUP BY a.Name;
```

| Name | PaintingCount |
|-------------------|---------------|
| Vincent van Gogh | 2 |
| Leonardo da Vinci | 1 |
| Pablo Picasso | 1 |
| Alfredo Disosa | 1 |
| Claude Monet | 1 |

5 rows in set (0.0023 sec)

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

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*List the names of artworks from the 'Modern Art Masterpieces' exhibition, along with their artists and categories*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title AS ArtworkName, a.Name AS ArtistName, c.Name AS Category
-> FROM ExhibitionArtworks ea JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID
-> JOIN Artworks aw ON ea.ArtworkID = aw.ArtworkID
-> JOIN Artists a ON aw.ArtistID = a.ArtistID JOIN Categories c ON
-> aw.CategoryID = c.CategoryID WHERE e.Title = 'Modern Art Masterpieces';
```

| ArtworkName | ArtistName | Category |
|----------------------|-------------------|-------------|
| Starry Night | Vincent van Gogh | Painting |
| Mona Lisa | Leonardo da Vinci | Painting |
| Guernica | Pablo Picasso | Painting |
| Campbell's Soup Cans | Andrew Wilson | Digital Art |
| Hybrid Forms | Pablo Picasso | Mixed Media |

5 rows in set (0.0014 sec)

5. Find the artists who have more than two artworks in the gallery.

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the artists who have more than two artworks in the gallery*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name, COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists a
-> JOIN Artworks aw ON a.ArtistID = aw.ArtistID GROUP BY a.Name
-> HAVING COUNT(aw.ArtworkID) > 2;
```

| Name | ArtworkCount |
|------------------|--------------|
| Vincent van Gogh | 3 |

1 row in set (0.0021 sec)

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

QUERY:

```
SELECT aw.Title FROM Artworks aw JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID WHERE e.Title IN ('Modern Art Masterpieces', 'Renaissance Art') GROUP BY aw.ArtworkID, aw.Title HAVING COUNT(DISTINCT e.ExhibitionID) = 2;
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /* Find the titles of artworks that were exhibited in both 'Modern Art Masterpieces' and 'Renaissance Art' exhibitions */
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title FROM Artworks aw JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID
-> JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID WHERE e.Title IN ('Modern Art Masterpieces',
-> 'Renaissance Art') GROUP BY aw.ArtworkID, aw.Title HAVING COUNT(DISTINCT e.ExhibitionID) = 2;
```

| Title |
|-----------|
| Mona Lisa |

1 row in set (0.0014 sec)

7. Find the total number of artworks in each category.

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the total number of artworks in each category*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT c.Name AS Category, COUNT(aw.ArtworkID) AS TotalArtworks FROM Categories c
-> JOIN Artworks aw ON c.CategoryID = aw.CategoryID GROUP BY c.Name;
```

| Category | TotalArtworks |
|-------------|---------------|
| Painting | 6 |
| Photography | 1 |
| Digital Art | 2 |
| Mixed Media | 1 |

4 rows in set (0.0017 sec)

8. List artists who have more than 3 artworks in the gallery.

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*List artists who have more than 3 artworks in the gallery*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name, COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists a
-> JOIN Artworks aw
-> ON a.ArtistID = aw.ArtistID GROUP BY a.Name HAVING COUNT(aw.ArtworkID) > 3;
```

Empty set (0.0022 sec)

```
MySQL localhost:3306 ssl visualartgallery SQL > /*here we don't have any artists who have more than 3 artworks in the gallery so we are going to add some values*/
MySQL localhost:3306 ssl visualartgallery SQL > INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL)
-> VALUES (11, 'Night Café', 2, 1, 1888, 'Another famous Van Gogh piece.', 'night_cafe.jpg');
```

Query OK, 1 row affected (0.0053 sec)

```
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name, COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists a JOIN Artworks aw
-> ON a.ArtistID = aw.ArtistID GROUP BY a.Name HAVING COUNT(aw.ArtworkID) > 3;
```

| Name | ArtworkCount |
|------------------|--------------|
| Vincent van Gogh | 4 |

1 row in set (0.0012 sec)

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

QUERY:

```
SELECT aw.Title FROM Artworks aw JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Nationality =
'Italian';
```

```
SELECT aw.Title FROM Artworks aw JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Nationality =
'Spanish';
```

```
SELECT aw.Title FROM Artworks aw JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Nationality =
'Dutch';
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the artworks created by artists from a specific nationality (e.g., Spanish).*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title FROM Artworks aw JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Nationality = 'Italian';
```

| Title |
|--------------|
| Mona Lisa |
| Water Lilies |

2 rows in set (0.0012 sec)

```
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title FROM Artworks aw JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Nationality = 'Spanish';
```

| Title |
|--------------|
| Guernica |
| Hybrid Forms |

2 rows in set (0.0009 sec)

```
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title FROM Artworks aw JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Nationality = 'Dutch';
```

| Title |
|---------------|
| Starry Night |
| Self-Portrait |
| Sunflowers |
| Night Café |

4 rows in set (0.0012 sec)

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

QUERY:

```
SELECT e.Title FROM Exhibitions e JOIN ExhibitionArtworks ea ON e.ExhibitionID = ea.ExhibitionID JOIN
Artworks aw ON ea.ArtworkID = aw.ArtworkID JOIN Artists a ON aw.ArtistID = a.ArtistID WHERE a.Name IN
('Vincent van Gogh', 'Leonardo da Vinci') GROUP BY e.Title HAVING COUNT(DISTINCT a.Name) = 2;
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*List exhibitions that feature artwork by both Vincent van Gogh and Leonardo da Vinci.*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT e.Title FROM Exhibitions e JOIN ExhibitionArtworks ea ON e.ExhibitionID = ea.ExhibitionID
-> JOIN Artworks aw ON ea.ArtworkID = aw.ArtworkID JOIN Artists a ON aw.ArtistID = a.ArtistID
-> WHERE a.Name IN ('Vincent van Gogh', 'Leonardo da Vinci') GROUP BY e.Title HAVING COUNT(DISTINCT a.Name) = 2;

+-----+
| Title |
+-----+
| Modern Art Masterpieces |
+-----+
1 row in set (0.0022 sec)
```

11. Find all the artworks that have not been included in any exhibition.

QUERY:

```
SELECT aw.Title FROM Artworks aw LEFT JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID
WHERE ea.ArtworkID IS NULL;
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find all the artworks that have not been included in any exhibition*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title FROM Artworks aw LEFT JOIN ExhibitionArtworks ea
-> ON aw.ArtworkID = ea.ArtworkID WHERE ea.ArtworkID IS NULL;

+-----+
| Title |
+-----+
| Self-Portrait |
| Sunflowers |
| Night Café |
+-----+
3 rows in set (0.0012 sec)
```

12. List artists who have created artworks in all available categories.

QUERY:

```
SELECT a.Name FROM Artists a JOIN Artworks ar ON a.ArtistID = ar.ArtistID GROUP BY a.ArtistID, a.Name
HAVING COUNT(DISTINCT ar.CategoryID) = (SELECT COUNT(*) FROM Categories);
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*List artists who have created artworks in all available categories*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name FROM Artists a JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> GROUP BY a.ArtistID, a.Name
-> HAVING COUNT(DISTINCT ar.CategoryID) = (SELECT COUNT(*) FROM Categories);

Empty set (0.0205 sec)

MySQL localhost:3306 ssl visualartgallery SQL > /* here we don't have any artists who have created artworks in all categories so we are adding some values*/
MySQL localhost:3306 ssl visualartgallery SQL > INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (101, 'Iron Form', 1, 2, 1930, 'A bold sculpture.', 'iron_form.jpg'), -- Sculpture
-> (102, 'Through the Lens', 1, 3, 1931, 'A photographic experiment.', 'lens.jpg'), -- Photography
-> (103, 'Cubist Code', 1, 4, 1932, 'A digital cubism artwork.', 'cubecode.jpg'); -- Digital Art

Query OK, 3 rows affected (0.0042 sec)

Records: 3 Duplicates: 0 Warnings: 0
Query OK, 0 rows affected (0.0003 sec)

MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name FROM Artists a JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> GROUP BY a.ArtistID, a.Name
-> HAVING COUNT(DISTINCT ar.CategoryID) = (SELECT COUNT(*) FROM Categories);

+-----+
| Name |
+-----+
| Pablo Picasso |
+-----+
1 row in set (0.0145 sec)
```

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

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the total number of artworks in each category*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT c.Name AS Category, COUNT(aw.ArtworkID) AS TotalArtworks FROM Categories c
-> JOIN Artworks aw ON c.CategoryID = aw.CategoryID GROUP BY c.Name;

+-----+-----+
| Category | TotalArtworks |
+-----+-----+
| Painting | 6 |
| Photography | 1 |
| Digital Art | 2 |
| Mixed Media | 1 |
+-----+-----+
4 rows in set (0.0017 sec)
```

14. Find the artists who have more than 2 artworks in the gallery.

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the artists who have more than 2 artworks in the gallery*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name, COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists a
-> JOIN Artworks aw
-> ON a.ArtistID = aw.ArtistID GROUP BY a.Name HAVING COUNT(aw.ArtworkID) > 2;

+-----+-----+
| Name           | ArtworkCount |
+-----+-----+
| Pablo Picasso  | 5            |
| Vincent van Gogh | 4            |
+-----+-----+
2 rows in set (0.0021 sec)
```

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(aw.Year) AS AvgYear FROM Categories c JOIN Artworks aw ON c.CategoryID = aw.CategoryID GROUP BY c.Name HAVING COUNT(aw.ArtworkID) > 1;
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*List the categories with the average year of artworks they contain, only for categories with more
MySQL localhost:3306 ssl visualartgallery SQL > /*List the categories with the average year of artworks they contain, only for categories with morethan 1 artwork*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT c.Name, AVG(aw.Year) AS AvgYear FROM Categories c
-> JOIN Artworks aw ON c.CategoryID = aw.CategoryID GROUP BY c.Name
-> HAVING COUNT(aw.ArtworkID) > 1;

+-----+-----+
| Name       | AvgYear |
+-----+-----+
| Painting   | 1850.0000 |
| Photography | 1909.0000 |
| Digital Art | 1971.3333 |
+-----+-----+
3 rows in set (0.0033 sec)
```

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

QUERY:

```
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';
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the artworks that were exhibited in the 'Modern Art Masterpieces' exhibition*/
MySQL localhost:3306 ssl visualartgallery SQL > 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';

+-----+
| Title |
+-----+
| Starry Night |
| Mona Lisa |
| Guernica |
| Campbell's Soup Cans |
| Hybrid Forms |
+-----+
5 rows in set (0.0010 sec)
```

17. Find the categories where the average year of artworks is greater than the average year of all artworks.

QUERY:

```
SELECT c.Name FROM Categories c JOIN Artworks aw ON c.CategoryID = aw.CategoryID GROUP BY c.Name HAVING AVG(aw.Year) > (SELECT AVG(Year) FROM Artworks)
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find the categories where the average year of artworks is greater than the average year of all artworks*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT c.Name FROM Categories c JOIN Artworks aw ON c.CategoryID = aw.CategoryID
-> GROUP BY c.Name HAVING AVG(aw.Year) > (SELECT AVG(Year) FROM Artworks);

+-----+
| Name |
+-----+
| Sculpture |
| Photography |
| Digital Art |
| Mixed Media |
+-----+
4 rows in set (0.0043 sec)
```


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

QUERY:

```
SELECT aw.Title FROM Artworks aw LEFT JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID
WHERE ea.ArtworkID IS NULL;
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Find all the artworks that have not been included in any exhibition*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT aw.Title FROM Artworks aw LEFT JOIN ExhibitionArtworks ea
-> ON aw.ArtworkID = ea.ArtworkID WHERE ea.ArtworkID IS NULL;

+-----+
| Title |
+-----+
| Self-Portrait |
| Sunflowers |
| Night Café |
+-----+
3 rows in set (0.0012 sec)
```

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

QUERY:

```
SELECT DISTINCT a.Name FROM Artists a JOIN Artworks ar ON a.ArtistID = ar.ArtistID
JOIN Artworks mona ON mona.Title = 'Mona Lisa' WHERE ar.CategoryID = mona.CategoryID AND a.ArtistID
!= mona.ArtistID;
```

```
MySQL localhost:3306 ssl visualartgallery SQL > /*Show artists who have artworks in the same category as "Mona Lisa."*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT DISTINCT a.Name FROM Artists a JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> JOIN Artworks mona ON mona.Title = 'Mona Lisa' WHERE
-> ar.CategoryID = mona.CategoryID AND a.ArtistID != mona.ArtistID;

+-----+
| Name |
+-----+
| Vincent van Gogh |
| Pablo Picasso |
| Alfredo Disousa |
| Claude Monet |
+-----+
4 rows in set (0.0022 sec)
```

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

QUERY:

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

```
MySQL localhost:3306 ssl visualartgallery SQL > /*List the names of artists and the number of artworks they have in the gallery*/
MySQL localhost:3306 ssl visualartgallery SQL > SELECT a.Name, COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists a
-> LEFT JOIN Artworks aw ON a.ArtistID = aw.ArtistID GROUP BY a.Name;

+-----+-----+
| Name | ArtworkCount |
+-----+-----+
| Pablo Picasso | 5 |
| Vincent van Gogh | 4 |
| Leonardo da Vinci | 1 |
| Alfredo Disousa | 1 |
| Andrew Wilson | 2 |
| Claude Monet | 1 |
+-----+-----+
6 rows in set (0.0013 sec)
```