

## 19.6.25

### CODING CHALLENGE SQL VIRTUAL ART GALLERY SCHEMA DDL AND DML

#### -- 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));
```

### DML (INSERT SAMPLE DATA TO TABLES)

#### -- 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.', 'guerninica.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);

## 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.**

```
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
▶	Pablo Picasso	4
	Vincent van Gogh	1
	Leonardo da Vinci	1

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

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

	Title
▶	Starry Night
	Les Demoiselles d'Avignon
	Three Musicians
	Guernica
	The Weeping Woman

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

```
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	ArtworkCount
▶	Pablo Picasso	4
	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.

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

	Title	ArtistName	Category
▶	Starry Night	Vincent van Gogh	Painting
	Mona Lisa	Leonardo da Vinci	Painting
	Guernica	Pablo Picasso	Painting

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

```
SELECT a.Name, COUNT(aw.ArtworkID) AS
ArtworkCount
```

	Name	ArtworkCount
▶	Pablo Picasso	4

```

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

```

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

```

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

```

	Title
▶	Mona Lisa

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

```

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

```

	Category	TotalArtworks
▶	Painting	5
	Sculpture	0
	Photography	0

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

```

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
▶	Pablo Picasso	4

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

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

	Title
▶	Guernica
	The Weeping Woman
	Les Femmes d'Alger (O. J. R. M.)
	Three Musicians

**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 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

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

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

	Title
▶	The Weeping Woman
	Les Femmes d'Alger (O. J. R. M.)
	Three Musicians

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

```
SELECT a.Name
FROM Artists a
JOIN Artworks aw ON a.ArtistID = aw.ArtistID
GROUP BY a.Name
```

	Name
▶	Pablo Picasso

HAVING COUNT(DISTINCT aw.CategoryID) = (SELECT COUNT(\*) FROM Categories);

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

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

	Category	TotalArtworks
▶	Painting	6
	Sculpture	1
	Photography	1

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

```
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	6

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

```
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	1849.0000

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

```
SELECT aw.Title
FROM Artworks aw
JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID
JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID
```

	Title
▶	Starry Night
	Mona Lisa
	Guernica

WHERE e.Title = 'Modern Art Masterpieces';

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

```
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

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

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

	Title
►	The Weeping Woman
	Les Demoiselles d'Avignon
	Three Musicians
	Sculpture A
	Photo B

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

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

	Name	ArtworkCount
►	Pablo Picasso	6
	Vincent van Gogh	1
	Leonardo da Vinci	1