

CODING CHALLENGE-VIRTUAL ART GALLERY

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```
create database virtual_artGallery
```

```
use virtual_artGallery
```

```
-- 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 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);

select * from Artists
select * from Categories
select * from Artworks
select * from Exhibitions
select * from ExhibitionArtworks

```

output:

Results

Messages

	ArtistID	Name	Biography	Nationality
1	1	Pablo Picasso	Renowned Spanish painter and sculptor.	Spanish
2	2	Vincent van Gogh	Dutch post-impressionist painter.	Dutch
3	3	Leonardo da Vinci	Italian polymath of the Renaissance.	Italian

	CategoryID	Name
1	1	Painting
2	2	Sculpture
3	3	Photography

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

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

	ExhibitionID	ArtworkID
1	1	1
2	1	2
3	1	3
4	2	2

--solving the 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 AS ArtistName,
  COUNT(Art.ArtworkID) AS ArtworkCount
FROM
  Artists A
  LEFT JOIN Artworks Art ON A.ArtistID = Art.ArtistID
GROUP BY
  A.Name
ORDER BY
  ArtworkCount DESC;

```

Output:

Results Messages

	ArtistName	ArtworkCount
1	Leonardo da Vinci	1
2	Pablo Picasso	1
3	Vincent van Gogh	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
  Art.Title,

```

```

A.Name AS ArtistName,
A.Nationality,
Art.Year
FROM
Artworks Art
JOIN Artists A ON Art.ArtistID = A.ArtistID
WHERE
A.Nationality IN ('Spanish', 'Dutch')
ORDER BY
Art.Year ASC;

```

Output:

Results		Messages		
	Title	ArtistName	Nationality	Year
1	Starry Night	Vincent van Gogh	Dutch	1889
2	Guernica	Pablo Picasso	Spanish	1937

--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 AS ArtistName,
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;

```

Output:

Results		Messages	
	ArtistName	ArtworkCount	
1	Leonardo da Vinci	1	
2	Pablo Picasso	1	
3	Vincent van Gogh	1	

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

```

SELECT
Art.Title AS ArtworkTitle,
A.Name AS ArtistName,
C.Name AS CategoryName
FROM
ExhibitionArtworks EA
JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID

```

```

JOIN Artworks Art ON EA.ArtworkID = Art.ArtworkID
JOIN Artists A ON Art.ArtistID = A.ArtistID
JOIN Categories C ON Art.CategoryID = C.CategoryID
WHERE
E.Title = 'Modern Art Masterpieces';

```

Output:

Results		Messages	
	ArtworkTitle	ArtistName	CategoryName
1	Starry Night	Vincent van Gogh	Painting
2	Mona Lisa	Leonardo da Vinci	Painting
3	Guernica	Pablo Picasso	Painting

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

```

SELECT
A.Name AS ArtistName,
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;

```

Output:

Results		Messages	
	ArtistName	ArtworkCount	

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

```

SELECT
Art.Title AS ArtworkTitle
FROM
ExhibitionArtworks EA1
JOIN Exhibitions E1 ON EA1.ExhibitionID = E1.ExhibitionID
JOIN Artworks Art ON EA1.ArtworkID = Art.ArtworkID
WHERE
E1.Title = 'Modern Art Masterpieces'
AND Art.ArtworkID IN (
SELECT EA2.ArtworkID

```

```

FROM ExhibitionArtworks EA2
JOIN Exhibitions E2 ON EA2.ExhibitionID = E2.ExhibitionID
WHERE E2.Title = 'Renaissance Art'
);

```

Output:

Results Messages	
	ArtworkTitle
1	Mona Lisa

```

--7. Find the total number of artworks in each category
SELECT C.Name AS CategoryName,
COUNT(Art.ArtworkID) AS ArtworkCount
FROM Categories C
LEFT JOIN Artworks Art ON C.CategoryID = Art.CategoryID
GROUP BY C.Name;

```

Output:

Results Messages		
	CategoryName	ArtworkCount
1	Painting	3
2	Photography	0
3	Sculpture	0

```

--8. List artists who have more than 3 artworks in the gallery.
SELECT A.Name AS ArtistName,
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;

```

Output:

Results Messages	
ArtistName	ArtworkCount

```

--9. Find the artworks created by artists from a specific
nationality (e.g., Spanish).
SELECT
    Art.Title AS ArtworkTitle,
    A.Name AS ArtistName
FROM
    Artworks Art

```

```

JOIN Artists A ON Art.ArtistID = A.ArtistID
WHERE
A.Nationality = 'Spanish';

```

Output:

Results		Messages
	ArtworkTitle	ArtistName
1	Guernica	Pablo Picasso

--10. List exhibitions that feature artwork by both Vincent van Gogh and Leonardo da --11. Find all the artworks that have not been included in any exhibition.

```

SELECT DISTINCT
E.Title AS ExhibitionTitle
FROM
Exhibitions E
JOIN ExhibitionArtworks EA ON E.ExhibitionID = EA.ExhibitionID
JOIN Artworks Art ON EA.ArtworkID = Art.ArtworkID
JOIN Artists A ON Art.ArtistID = A.ArtistID
WHERE
A.Name IN ('Vincent van Gogh', 'Leonardo da Vinci')
GROUP BY
E.Title
HAVING
COUNT(DISTINCT A.Name) = 2;

```

Output:

Results		Messages
	ExhibitionTitle	
1	Modern Art Masterpieces	

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

```

SELECT
Art.Title AS ArtworkTitle,
A.Name AS ArtistName
FROM
Artworks Art
JOIN Artists A ON Art.ArtistID = A.ArtistID
WHERE
Art.ArtworkID NOT IN (SELECT ArtworkID FROM ExhibitionArtworks);

```


Output:



Results	Messages
ArtworkTitle	ArtistName

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

```
SELECT
  A.Name AS ArtistName
FROM
  Artists A
  JOIN Artworks Art ON A.ArtistID = Art.ArtistID
GROUP BY
  A.Name
HAVING
  COUNT(DISTINCT Art.CategoryID) = (SELECT COUNT(CategoryID) FROM
  Categories);
```

Output:

100 % 

 Results  Messages

ArtistName

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

```
SELECT
  C.Name AS CategoryName,
  COUNT(Art.ArtworkID) AS ArtworkCount
FROM
  Categories C
  LEFT JOIN Artworks Art ON C.CategoryID = Art.CategoryID
GROUP BY
  C.Name;
```

Output:

Results	Messages
CategoryName	ArtworkCount
1 Painting	3
2 Photography	0
3 Sculpture	0

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


```

SELECT
  A.Name AS ArtistName,
  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;

```

Output:

Results Messages	
ArtistName	ArtworkCount

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

```

SELECT
  C.Name AS CategoryName,
  AVG(Art.Year) AS AvgYear
FROM
  Categories C
  JOIN Artworks Art ON C.CategoryID = Art.CategoryID
GROUP BY
  C.Name
HAVING
  COUNT(Art.ArtworkID) > 1;

```

Output:

Results Messages		
	CategoryName	AvgYear
1	Painting	1776

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

```

SELECT
  Art.Title AS ArtworkTitle,
  A.Name AS ArtistName
FROM
  Artworks Art
  JOIN ExhibitionArtworks EA ON Art.ArtworkID = EA.ArtworkID
  JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID
  JOIN Artists A ON Art.ArtistID = A.ArtistID
WHERE
  E.Title = 'Modern Art Masterpieces';

```

Output:

	ArtworkTitle	ArtistName
1	Starry Night	Vincent van Gogh
2	Mona Lisa	Leonardo da Vinci
3	Guernica	Pablo Picasso

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

```
SELECT
  C.Name AS CategoryName,
  AVG(Art.Year) AS AvgYear
FROM
  Categories C
  JOIN Artworks Art ON C.CategoryID = Art.CategoryID
GROUP BY
  C.Name
HAVING
  AVG(Art.Year) > (SELECT AVG(Year) FROM Artworks);
```

Output:

	CategoryName	AvgYear
--	--------------	---------

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

```
SELECT
  Art.Title AS ArtworkTitle,
  A.Name AS ArtistName
FROM
  Artworks Art
  JOIN Artists A ON Art.ArtistID = A.ArtistID
WHERE
  Art.ArtworkID NOT IN (SELECT ArtworkID FROM ExhibitionArtworks);
```

Output:

	ArtworkTitle	ArtistName
--	--------------	------------

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

```
SELECT
```

```

A.Name AS ArtistName
FROM
  Artworks Art1
  JOIN Categories C ON Art1.CategoryID = C.CategoryID
  JOIN Artworks Art2 ON Art1.CategoryID = Art2.CategoryID
  JOIN Artists A ON Art2.ArtistID = A.ArtistID
WHERE
  Art1.Title = 'Mona Lisa';

```

Output:

	ArtistName
1	Vincent van Gogh
2	Leonardo da Vinci
3	Pablo Picasso

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

```

SELECT
  A.Name AS ArtistName,
  COUNT(Art.ArtworkID) AS ArtworkCount
FROM
  Artists A
  LEFT JOIN Artworks Art ON A.ArtistID = Art.ArtistID
GROUP BY
  A.Name;

```

Output:

	ArtistName	ArtworkCount
1	Leonardo da Vinci	1
2	Pablo Picasso	1
3	Vincent van Gogh	1