

CODING CHALLENGE

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Coding Challenge: Virtual Art Gallery

```
create database Virtual_art_gallery;
use Virtual_art_gallery;

-- 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 Picassos 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);
```

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 Num_of_Artworks from Artists a
JOIN Artworks aw ON
a.ArtistID=aw.ArtistID group by
a.Name order by Num_of_Artworks desc;
```

Output:

	Name	Num_of_Artworks
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 aw.Title From Artworks aw Join Artists a
ON a.ArtistID=aw.ArtistID
where a.Nationality='Spanish' or a.Nationality='Dutch'
ORDER by aw.year;
```

Output:

Results		Messages
	Title	
1	Starry Night	
2	Guernica	

/*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 Num_of_Paintings from Artworks aw
JOIN Artists a on a.ArtistID= aw.ArtistID
Join Categories c on aw.CategoryID=c.CategoryID
where c.name='Painting' Group by a.Name ;
```

Output:

Results			Messages
	Name	Num_of_Paintings	
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 aw.title as Artwork_name ,a.Name as Artist_name,
c.Name as Category_name from Artworks aw
JOIN Artists a on a.ArtistID=aw.ArtistID
Join categories c on c.CategoryID=aw.CategoryID
Join ExhibitionArtworks ea on ea.ArtworkID=aw.ArtworkID
Join Exhibitions e on e.ExhibitionID=ea.ExhibitionID
where e.Title='Modern Art Masterpieces' ;
```

Output:

Results				Messages
	Artwork_name	Artist_name	Category_name	
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 , count(aw.ArtworkID) as Num_of_Artworks
from Artists a
JOIN Artworks aw ON a.ArtistID=aw.ArtistID
group by a.Name Having count(aw.ArtworkID) >2;
```

Output:

Results	Messages
Name	Num_of_Artworks

/*Question6 Find the titles of artworks that were exhibited in both 'Modern Art Masterpieces' and 'Renaissance Art' exhibitions*/

```
SELECT
    aw.title as Title_of_Artworks
FROM artworks aw
JOIN ExhibitionArtworks ea ON ea.ArtworkID=aw.ArtworkID
JOIN exhibitions e ON ea.ExhibitionID = e.ExhibitionID
WHERE e.Title IN ('Modern Art Masterpieces', 'Renaissance Art')
GROUP BY aw.Title;
```

Output:

Results	Messages
Title_of_Artworks	
1	Guernica
2	Mona Lisa
3	Starry Night

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

```
select c.name, count(aw.ArtworkID) as No_of_artworks
from Categories c
left Join Artworks aw
on c.CategoryID=aw.CategoryID group by c.name ;
```

Output:

Results Messages		
	name	No_of_artworks
1	Painting	3
2	Photography	0
3	Sculpture	0

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

```
Select a.Name FROM Artists a
JOIN Artworks Aw ON A.ArtistID = Aw.ArtistID
GROUP BY A.Name
HAVING COUNT(Aw.ArtworkID) >3;
```

Output:

Results Messages	
	Name

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

```
SELECT aw.title AS Artwork_title, a.Name, aw.year
FROM artworks aw
JOIN artists a ON aw.ArtistID = a.ArtistID
WHERE a.nationality = 'Spanish';
```

Output:

Results Messages			
	Artwork_title	Name	year
1	Guernica	Pablo Picasso	1937

/*Question10 List exhibitions that feature artwork by both Vincent van Gogh and Leonardo da Vinci.*/

```
SELECT e.Title
FROM Exhibitions e
JOIN ExhibitionArtworks ea1 ON e.ExhibitionID = ea1.ExhibitionID
```

```

JOIN Artworks aw1 ON ea1.ArtworkID = aw1.ArtworkID
JOIN Artists a1 ON aw1.ArtistID = a1.ArtistID
JOIN ExhibitionArtworks ea2 ON e.ExhibitionID = ea2.ExhibitionID
JOIN Artworks aw2 ON ea2.ArtworkID = aw2.ArtworkID
JOIN Artists a2 ON aw2.ArtistID = a2.ArtistID
WHERE a1.Name = 'Vincent van Gogh' AND a2.Name = 'Leonardo da Vinci';

```

Output:

Results		Messages
	Title	
1	Modern Art Masterpieces	

```

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

```

```

select aw.title, a.Name From Artworks aw
Join Artists a on aw.ArtistID=a.ArtistID
Left join ExhibitionArtworks ea on aw.ArtworkID=ea.ArtworkID
where ea.ExhibitionID IS null;

```

Output:

Results		Messages
title	Name	

```

/*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
JOIN Categories c ON aw.CategoryID = c.CategoryID
GROUP BY a.Name
HAVING COUNT(DISTINCT c.CategoryID) = (SELECT COUNT(CategoryID) FROM Categories);

```

Output:

Results	Messages
Name	

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

```
select c.name, count(aw.ArtworkID)
as No_of_artworks from Categories c left Join Artworks aw
on c.CategoryID=aw.CategoryID group by c.name ;
```

Output:

Results	Messages
name	No_of_artworks
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 FROM Artists a
JOIN Artworks Aw ON A.ArtistID = Aw.ArtistID
GROUP BY A.Name
HAVING COUNT(Aw.ArtworkID) >2;
```

Output:

Results	Messages
Name	

/*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 Average_Year FROM Categories c
JOIN Artworks Aw ON c.CategoryID = Aw.CategoryID
GROUP BY C.Name
HAVING COUNT(Aw.ArtworkID) > 1;
```


Output:

Results Messages		
	Name	Average_Year
1	Painting	1776

```
/*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
WHERE e.Title = 'Modern Art Masterpieces';
```

Output:

Results Messages		
	Title	
1	Starry Night	
2	Mona Lisa	
3	Guernica	

```
/*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);
```

Output:

Results Messages		
	Name	

```
/*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;
```

Output:

Results		Messages
	Title	

```
/*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');
```

Output:

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

```
/*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;
```

Output:

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