
```
Create database Virtual_art_gallery;
use Virtual_art_gallery;

-- Create the Artist 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 Artist 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);

/*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:

	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

```
/*6. 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

```
/*10. 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

1	Modern Art Masterpieces
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/*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 /Output is empty because of no artist created artwork in all categories/

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: /No artist found more than 2 artworks in the gallery/

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

1	Painting	1776
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/*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