

VIRTUAL ART GALLERY

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Virtual Art Gallery Shema DDL and DML

```
mysql> show databases;
```

Database
Banking_system
HMBank
information_schema
mysql
performance_schema
practice
ProjectManagement
sys
testdb

9 rows in set (0.03 sec)

```
mysql> create database VirtualArtGallery;
```

Query OK, 1 row affected (0.01 sec)

```
mysql> use VirtualArtGallery;
```

Database changed

```
mysql> CREATE TABLE Artists (  
-> ArtistID INT PRIMARY KEY,  
-> Name VARCHAR(255) NOT NULL,  
-> Biography TEXT,  
-> Nationality VARCHAR(100));
```

Query OK, 0 rows affected (0.01 sec)

```
mysql> 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	

```
mysql> CREATE TABLE Categories (  
-> CategoryID INT PRIMARY KEY,  
-> Name VARCHAR(100) NOT NULL);
```

Query OK, 0 rows affected (0.01 sec)

```
mysql> desc Categories;
```

Field	Type	Null	Key	Default	Extra
CategoryID	int	NO	PRI	NULL	
Name	varchar(100)	NO		NULL	

```
mysql> 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 (0.01 sec)
```

```
mysql> 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	

```
mysql> CREATE TABLE Exhibitions (  
-> ExhibitionID INT PRIMARY KEY,  
-> Title VARCHAR(255) NOT NULL,  
-> StartDate DATE,  
-> EndDate DATE,  
-> Description TEXT);  
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> 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	

```
mysql> 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 (0.01 sec)
```

```
mysql> desc ExhibitionArtworks;
```

Field	Type	Null	Key	Default	Extra
ExhibitionID	int	NO	PRI	NULL	
ArtworkID	int	NO	PRI	NULL	

```
mysql> 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'),  
-> (4, 'Michelangelo', 'Italian sculptor and painter.',  
'Italian'),  
-> (5, 'Andy Warhol', 'American pop artist.', 'American');  
Query OK, 5 rows affected (0.01 sec)  
Records: 5 Duplicates: 0 Warnings: 0
```

```
mysql> select * from Artists;
```

ArtistID	Name	Biography	Nationality
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
4	Michelangelo	Italian sculptor and painter.	Italian
5	Andy Warhol	American pop artist.	American

```
mysql> INSERT INTO Categories (CategoryID, Name) VALUES
```

```
    -> (1, 'Painting'),  
    -> (2, 'Sculpture'),  
    -> (3, 'Photography');
```

```
Query OK, 3 rows affected (0.01 sec)
```

```
Records: 3  Duplicates: 0  Warnings: 0
```

```
mysql> select * from Categories;
```

CategoryID	Name
1	Painting
2	Sculpture
3	Photography
NULL	NULL

```
mysql> 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 Creation of Adam', 4, 1, 1512, 'Michelangelo\'s  
famous fresco.', 'creation_adam.jpg'),  
    -> (5, 'Campbell\'s Soup Cans', 5, 1, 1962, 'Pop art masterpiece  
by Warhol.', 'soup_cans.jpg'),  
    -> (6, 'David', 4, 2, 1504, 'Michelangelo\'s marble statue.',  
'david.jpg'),  
    -> (7, 'The Thinker', 4, 2, 1904, 'Famous sculpture by Rodin.',  
'thinker.jpg'),  
    -> (8, 'The Last Supper', 3, 1, 1495, 'Leonardo\'s large mural  
painting.', 'last_supper.jpg'),  
    -> (9, 'Sunflowers', 2, 1, 1888, 'Still-life painting by Van  
Gogh.', 'sunflowers.jpg'),  
    -> (10, 'Marilyn Monroe', 5, 3, 1962, 'Pop art portrait by  
Warhol.', 'marilyn.jpg');
```

```
Query OK, 10 rows affected (0.01 sec)
```

```
Records: 10  Duplicates: 0  Warnings: 0
```

```
mysql> 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 Creation of Adam	4	1	1512	Michelangelo's famous fresco.	creation_adam.jpg
5	Campbell's Soup Cans	5	1	1962	Pop art masterpiece by Warhol.	soup_cans.jpg
6	David	4	2	1504	Michelangelo's marble statue.	david.jpg
7	The Thinker	4	2	1904	Famous sculpture by Rodin.	thinker.jpg
8	The Last Supper	3	1	1495	Leonardo's large mural painting.	last_supper.jpg
9	Sunflowers	2	1	1888	Still-life painting by Van Gogh.	sunflowers.jpg
10	Marilyn Monroe	5	3	1962	Pop art portrait by Warhol.	marilyn.jpg
NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
mysql> 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, 'Sculpture Wonders', '2023-07-01', '2023-09-01',
'Display of famous sculptures. ');
Query OK, 3 rows affected (0.00 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

```
mysql> 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	Sculpture Wonders	2023-07-01	2023-09-01	Display of famous sculptures.
NULL	NULL	NULL	NULL	NULL

```
mysql> INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID)
VALUES
-> (1, 1),
-> (1, 2),
-> (1, 3),
-> (1, 5),
-> (1, 10),
-> (2, 2),
-> (2, 4),
-> (2, 8),
-> (3, 6),
-> (3, 7);
Query OK, 10 rows affected (0.00 sec)
Records: 10 Duplicates: 0 Warnings: 0
```

```
mysql> select * from ExhibitionArtworks;
```

ExhibitionID	ArtworkID
1	1
1	2
2	2
1	3
2	4
1	5
3	6
3	7
2	8
1	10
NULL	NULL

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

Name	ArtworkCou...
Michelangelo	3
Vincent van Gogh	2
Leonardo da Vinci	2
Andy Warhol	2
Pablo Picasso	1

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

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

Title	Year	Name	Nationality
Sunflowers	1888	Vincent van Gogh	Dutch
Starry Night	1889	Vincent van Gogh	Dutch
Guernica	1937	Pablo Picasso	Spanish

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

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

Name	PaintingCount
Vincent van Gogh	2
Leonardo da Vinci	2
Pablo Picasso	1
Michelangelo	1
Andy Warhol	1

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

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

Title	Artist	Category
Starry Night	Vincent van Gogh	Painting
Mona Lisa	Leonardo da Vinci	Painting
Guernica	Pablo Picasso	Painting
Campbell's Soup Cans	Andy Warhol	Painting
Marilyn Monroe	Andy Warhol	Photography

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

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

Name	ArtworkCou...
Michelangelo	3

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

```
mysql> 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 IN ('Modern Art Masterpieces', 'Renaissance Art')
-> GROUP BY ar.Title
-> HAVING COUNT(DISTINCT e.Title) = 2;
```

Title
Mona Lisa

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

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

Category	TotalArtworks
Painting	7
Sculpture	2
Photography	1

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

```
mysql> SELECT a.Name, COUNT(ar.ArtworkID) AS ArtworkCount
-> FROM Artists a
-> JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> GROUP BY a.Name
-> HAVING COUNT(ar.ArtworkID) > 3;
Empty set (0.00 sec)
```

Name	ArtworkCount

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

```
mysql> SELECT ar.Title, a.Name, a.Nationality
-> FROM Artworks ar
-> JOIN Artists a ON ar.ArtistID = a.ArtistID
-> WHERE a.Nationality = 'Spanish';
```

Title	Name	Nationality
Guernica	Pablo Picasso	Spanish

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

```
mysql> SELECT e.Title
-> FROM Exhibitions e
-> JOIN ExhibitionArtworks ea ON e.ExhibitionID =
ea.ExhibitionID
-> JOIN Artworks ar ON ea.ArtworkID = ar.ArtworkID
-> JOIN Artists a ON ar.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.

```
mysql> SELECT ar.Title
-> FROM Artworks ar
-> LEFT JOIN ExhibitionArtworks ea ON ar.ArtworkID =
ea.ArtworkID
-> WHERE ea.ExhibitionID IS NULL;
```

Title
Sunflowers

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

```
mysql> SELECT a.Name
-> FROM Artists a
-> JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> JOIN Categories c ON ar.CategoryID = c.CategoryID
-> GROUP BY a.Name
-> HAVING COUNT(DISTINCT ar.CategoryID) = (SELECT COUNT(*) FROM
Categories);
Empty set (0.02 sec)
```

Name

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

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

Category	TotalArtworks
Painting	7
Sculpture	2
Photography	1

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

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

Name	ArtworkCou...
Michelangelo	3

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

```
mysql> SELECT c.Name AS Category, AVG(ar.Year) AS AvgYear
-> FROM Categories c
-> JOIN Artworks ar ON c.CategoryID = ar.CategoryID
-> GROUP BY c.Name
-> HAVING COUNT(ar.ArtworkID) > 1;
```

Category	AvgYear
Painting	1740.8571
Sculpture	1704.0000

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

```
mysql> 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
Marilyn Monroe

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

```
mysql> SELECT c.Name AS Category, AVG(ar.Year) AS AvgYear
-> FROM Categories c
-> JOIN Artworks ar ON c.CategoryID = ar.CategoryID
-> GROUP BY c.Name
-> HAVING AVG(ar.Year) > (SELECT AVG(Year) FROM Artworks);
```

Category	AvgYear
Photography	1962.0000

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

```
mysql> SELECT ar.Title
-> FROM Artworks ar
-> LEFT JOIN ExhibitionArtworks ea ON ar.ArtworkID =
ea.ArtworkID
-> WHERE ea.ExhibitionID IS NULL;
```

Title
Sunflowers

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

```
mysql> SELECT DISTINCT a.Name
-> FROM Artists a
-> JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> WHERE ar.CategoryID = (SELECT CategoryID FROM Artworks WHERE
Title = 'Mona Lisa');
```

Name
Vincent van Gogh
Leonardo da Vinci
Pablo Picasso
Michelangelo
Andy Warhol

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

```
mysql> SELECT a.Name, COUNT(ar.ArtworkID) AS ArtworkCount
-> FROM Artists a
-> LEFT JOIN Artworks ar ON a.ArtistID = ar.ArtistID
-> GROUP BY a.Name
-> ORDER BY ArtworkCount;
```

Name	ArtworkCount
Pablo Picasso	1
Vincent van Gogh	2
Leonardo da Vinci	2
Andy Warhol	2
Michelangelo	3