

VIRTUAL ART GALLERY

POPURI KEERTHIKA

```
mysql> CREATE TABLE Artists (  
-> ArtistID INT PRIMARY KEY,  
-> Name VARCHAR(255) NOT NULL,  
-> Biography TEXT,  
-> Nationality VARCHAR(100));  
Query OK, 0 rows affected (0.06 sec)  
  
mysql> CREATE TABLE Categories (  
-> CategoryID INT PRIMARY KEY,  
-> Name VARCHAR(100) NOT NULL);  
Query OK, 0 rows affected (0.10 sec)  
  
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 (0.21 sec)
```

```
mysql> CREATE TABLE Exhibitions (  
-> ExhibitionID INT PRIMARY KEY,  
-> Title VARCHAR(255) NOT NULL,  
-> StartDate DATE,  
-> EndDate DATE,  
-> Description TEXT);  
Query OK, 0 rows affected (0.10 sec)  
  
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 (0.15 sec)
```

```
mysql> INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES  
-> (1, 'John Smith', 'American landscape painter.', 'American'),  
-> (2, 'Linda Johnson', 'British sculptor specializing in bronze art.', 'British'),  
-> (3, 'Raj Patel', 'Indian portrait artist.', 'Indian'),  
-> (4, 'Anita Gupta', 'Renowned Indian abstract painter.', 'Indian'),  
-> (5, 'David Lee', 'Canadian urban life photographer.', 'Canadian'),  
-> (6, 'Sarah Khan', 'Pakistani painter of intricate miniature art.', 'Pakistani'),  
-> (7, 'Michael Brown', 'Australian surrealist artist.', 'Australian'),  
-> (8, 'Priya Sharma', 'Indian sculptor inspired by nature.', 'Indian'),  
-> (9, 'Robert Chen', 'Chinese painter blending traditional and modern styles.', 'Chinese'),  
-> (10, 'Maria Fernandez', 'Spanish contemporary artist.', 'Spanish');  
Query OK, 10 rows affected (0.07 sec)  
Records: 10 Duplicates: 0 Warnings: 0
```

```
mysql> INSERT INTO Categories (CategoryID, Name) VALUES
-> (1, 'Painting'),
-> (2, 'Sculpture'),
-> (3, 'Photography'),
-> (4, 'Drawing'),
-> (5, 'Digital Art');
Query OK, 5 rows affected (0.06 sec)
Records: 5 Duplicates: 0 Warnings: 0
```

```
mysql> INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (1, 'Mountain Sunset', 1, 1, 2010, 'A landscape painting of mountains at sunset.', 'mountain_sunset.jpg'),
-> (2, 'Bronze Statue', 2, 2, 2015, 'A bronze sculpture of a mythological figure.', 'bronze_statue.jpg'),
-> (3, 'Portrait', 3, 1, 2005, 'A portrait capturing the essence of womanhood.', 'portrait_woman.jpg'),
-> (4, 'Abstract Art', 4, 1, 2018, 'An abstract painting combining colors and forms.', 'abstract_fusion.jpg'),
-> (5, 'Urban Photography', 5, 3, 2020, 'A series of photographs showcasing city life.', 'urban_symphony.jpg'),
-> (6, 'Miniature Painting', 6, 1, 2012, 'An intricately detailed miniature painting.', 'miniature_masterpiece.jpg'),
-> (7, 'Dreamscape', 7, 1, 2017, 'A surrealistic painting depicting a dreamscape.', 'dreamscape.jpg'),
-> (8, 'Sculpture', 8, 2, 2019, 'A sculpture capturing the harmony between humans and nature.', 'natures_embrace.jpg'),
-> (9, 'Ink Sketch', 9, 4, 2014, 'A traditional Chinese ink sketch of a serene landscape.', 'chinese_ink_sketch.jpg'),
-> (10, 'Digital Art', 10, 5, 2021, 'A vibrant digital artwork bursting with color.', 'colorful_digital.jpg');
Query OK, 10 rows affected (0.07 sec)
Records: 10 Duplicates: 0 Warnings: 0

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.');
```

```
mysql> INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES
-> (1, 1),
-> (1, 2),
-> (1, 3),
-> (2, 3),
-> (2, 4),
-> (2, 5);
Query OK, 6 rows affected (0.06 sec)
Records: 6 Duplicates: 0 Warnings: 0
```

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(w.artworkid) AS num_artworks
-> FROM artists a
-> LEFT JOIN artworks w ON a.artistid = w.artistid
-> GROUP BY a.name
-> ORDER BY num_artworks DESC;
```

name	num_artworks
John Smith	1
Linda Johnson	1
Raj Patel	1
Anita Gupta	1
David Lee	1
Sarah Khan	1
Michael Brown	1
Priya Sharma	1
Robert Chen	1
Maria Fernandez	1

```
10 rows in set (0.06 sec)
```

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 w.title
-> FROM artworks w
-> JOIN artists a ON w.artistid = a.artistid
-> WHERE a.nationality IN ('Spanish', 'Dutch')
-> ORDER BY w.year ASC;
```

title
Digital Art

```
1 row in set (0.00 sec)
```

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(w.artworkid) AS num_paintings
-> FROM artists a
-> JOIN artworks w ON a.artistid = w.artistid
-> JOIN categories c ON w.categoryid = c.categoryid
-> WHERE c.name = 'Painting'
-> GROUP BY a.name;
```

name	num_paintings
John Smith	1
Raj Patel	1
Anita Gupta	1
Sarah Khan	1
Michael Brown	1

5 rows in set (0.00 sec)

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

```
mysql> SELECT w.title, a.name, c.name AS category
-> FROM artworks w
-> JOIN exhibitionartworks e ON w.artworkid = e.artworkid
-> JOIN exhibitions x ON e.exhibitionid = x.exhibitionid
-> JOIN artists a ON w.artistid = a.artistid
-> JOIN categories c ON w.categoryid = c.categoryid
-> WHERE x.title = 'Modern Art Masterpieces';
```

title	name	category
Mountain Sunset	John Smith	Painting
Bronze Statue	Linda Johnson	Sculpture
Portrait	Raj Patel	Painting

3 rows in set (0.00 sec)

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

```
mysql> INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (11, 'Mountain Sunrise', 1, 1, 2010, 'A landscape painting of mountains at sunset.', 'mountain_sunset.jpg'),
-> (12, 'Bronze fish', 2, 2, 2015, 'A bronze sculpture of a mythological figure.', 'bronze_statue.jpg');
Query OK, 2 rows affected (0.00 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql> INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (13, 'Mount Sunrise', 1, 1, 2010, 'A landscape painting of mountains at sunset.', 'mountain_sunset.jpg'),
-> (14, 'B fish', 2, 2, 2015, 'A bronze sculpture of a mythological figure.', 'bronze_statue.jpg');
Query OK, 2 rows affected (0.00 sec)
Records: 2 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT a.name
-> FROM artists a
-> JOIN artworks w ON a.artistid = w.artistid
-> GROUP BY a.artistid
-> HAVING COUNT(w.artworkid) > 2;
+-----+
| name          |
+-----+
| John Smith    |
| Linda Johnson |
+-----+
2 rows in set (0.00 sec)
```

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

```
mysql> SELECT w.title
-> FROM artworks w
-> JOIN exhibitionartworks e1 ON w.artworkid = e1.artworkid
-> JOIN exhibitions x1 ON e1.exhibitionid = x1.exhibitionid
-> JOIN exhibitionartworks e2 ON w.artworkid = e2.artworkid
-> JOIN exhibitions x2 ON e2.exhibitionid = x2.exhibitionid
-> WHERE x1.title = 'Modern Art Masterpieces' AND x2.title = 'Renaissance Art';
+-----+
| title      |
+-----+
| Portrait   |
+-----+
1 row in set (0.01 sec)
```

7. Find the total number of artworks in each category

```
mysql> SELECT c.name, COUNT(w.artworkid) AS total_artworks
-> FROM categories c
-> LEFT JOIN artworks w ON c.categoryid = w.categoryid
-> GROUP BY c.name;
+-----+-----+
| name          | total_artworks |
+-----+-----+
| Painting      | 7              |
| Sculpture     | 4              |
| Photography   | 1              |
| Drawing       | 1              |
| Digital Art   | 1              |
+-----+-----+
5 rows in set (0.00 sec)
```

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

```
mysql> INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (15, 'jeju', 1, 1, 2010, 'A landscape painting of mountains at sunset.', 'mountain_sunset.jpg'),
-> (16, 'vincenzo', 2, 2, 2015, 'A bronze sculpture of a mythological figure.', 'bronze_statue.jpg');
Query OK, 2 rows affected (0.00 sec)
Records: 2 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT a.name
-> FROM artists a
-> JOIN artworks w ON a.artistid = w.artistid
-> GROUP BY a.name
-> HAVING COUNT(w.artworkid) > 3;

+-----+
| name          |
+-----+
| John Smith    |
| Linda Johnson |
+-----+
2 rows in set (0.00 sec)
```

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

```
mysql> SELECT *
-> FROM artworks
-> WHERE artistid IN (SELECT artistid FROM artists WHERE nationality = 'Spanish');

+-----+-----+-----+-----+-----+-----+-----+
| ArtworkID | Title          | ArtistID | CategoryID | Year | Description                                                                 | ImageURL          |
+-----+-----+-----+-----+-----+-----+-----+
| 10         | Digital Art    | 10       | 5          | 2021 | A vibrant digital artwork bursting with color.                          | colorful_digital.jpg |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)
```

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

```
mysql> INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES
-> (15, 'Vincent van Gogh', 'Dutch post-impressionist painter.', 'Dutch'),
-> (16, 'Leonardo da Vinci', 'Italian polymath of the Renaissance.', 'Italian'),
-> (17, 'Pablo Picasso', 'Renowned Spanish painter and sculptor.', 'Spanish');
Query OK, 3 rows affected (0.01 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (18, 'Starry Night', 15, 1, 1889, 'A famous painting by Vincent van Gogh.', 'starry_night.jpg'),
-> (21, 'Mona Lisa', 16, 1, 1503, 'The iconic portrait by Leonardo da Vinci.', 'mona_lisa.jpg'),
-> (31, 'Guernica', 17, 1, 1937, 'Pablo Picasso's powerful anti-war mural.', 'guernica.jpg');
Query OK, 3 rows affected (0.01 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> INSERT INTO Exhibitions (ExhibitionID, Title, StartDate, EndDate, Description) VALUES
-> (7, 'Modern Art Masterpieces', '2023-01-01', '2023-03-01', 'A collection of modern art masterpieces.'),
-> (8, 'Renaissance Art', '2023-04-01', '2023-06-01', 'A showcase of Renaissance art treasures.');
Query OK, 2 rows affected (0.01 sec)
Records: 2 Duplicates: 0 Warnings: 0

mysql> -- Map artworks to the "Modern Art Masterpieces" exhibition
Query OK, 0 rows affected (0.00 sec)

mysql> INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES
-> (7, 18),
-> (7, 21),
-> (7, 31);
Query OK, 3 rows affected (0.00 sec)
Records: 3 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT e.*
-> FROM exhibitions e
-> WHERE EXISTS (
-> SELECT 1
-> FROM exhibitionartworks ea
-> JOIN artworks w ON ea.artworkid = w.artworkid
-> JOIN artists a ON w.artistid = a.artistid
-> WHERE ea.exhibitionid = e.exhibitionid
-> AND a.name IN ('Vincent van Gogh', 'Leonardo da Vinci')
-> GROUP BY ea.exhibitionid
-> HAVING COUNT(DISTINCT a.name) = 2
-> );
```

ExhibitionID	Title	StartDate	EndDate	Description
7	Modern Art Masterpieces	2023-01-01	2023-03-01	A collection of modern art masterpieces.

1 row in set (0.00 sec)

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

```
mysql> SELECT *
-> FROM artworks
-> WHERE artworkid NOT IN (SELECT artworkid FROM exhibitionartworks);
```

ArtworkID	Title	ArtistID	CategoryID	Year	Description
6	Miniature Painting	6	1	2012	An intricately detailed miniature painting.
7	Dreamscape	7	1	2017	A surrealistic painting depicting a dreamscape.
8	Sculpture	8	2	2019	A sculpture capturing the harmony between humans and nature.
9	Ink Sketch	9	4	2014	A traditional Chinese ink sketch of a serene landscape.
10	Digital Art	10	5	2021	A vibrant digital artwork bursting with color.
11	Mountain Sunrise	1	1	2010	A landscape painting of mountains at sunset.
12	Bronze fish	2	2	2015	A bronze sculpture of a mythological figure.
13	Mount Sunrise	1	1	2010	A landscape painting of mountains at sunset.
14	B fish	2	2	2015	A bronze sculpture of a mythological figure.

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

```
mysql> INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES
-> (21, 'Artist', 'A new artist who creates artworks in all categories.', 'Unknown');
Query OK, 1 row affected (0.01 sec)

mysql> INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
-> (101, 'Artwork 1', 21, 1, 2020, 'Description of Artwork 1', 'image_url.jpg'),
-> (102, 'Artwork 2', 21, 2, 2021, 'Description of Artwork 2', 'image_url.jpg'),
-> (103, 'Artwork 3', 21, 3, 2019, 'Description of Artwork 3', 'image_url.jpg'),
-> (104, 'Artwork 4', 21, 4, 2018, 'Description of Artwork 4', 'image_url.jpg'),
-> (105, 'Artwork 5', 21, 5, 2017, 'Description of Artwork 5', 'image_url.jpg');
Query OK, 5 rows affected (0.01 sec)
Records: 5 Duplicates: 0 Warnings: 0
```

```
mysql> SELECT a.*
-> FROM artists a
-> WHERE NOT EXISTS (
-> SELECT c.categoryid
-> FROM categories c
-> WHERE NOT EXISTS (
-> SELECT 1
-> FROM artworks w
-> WHERE w.artistid = a.artistid
-> AND w.categoryid = c.categoryid
-> )
-> );
```

ArtistID	Name	Biography	Nationality
21	Artist	A new artist who creates artworks in all categories.	Unknown

1 row in set (0.00 sec)

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

```
mysql> SELECT c.name AS category, COUNT(w.artworkid) AS totalartworks
-> FROM categories c
-> LEFT JOIN artworks w ON c.categoryid = w.categoryid
-> GROUP BY c.name;
```

category	totalartworks
Painting	11
Sculpture	5
Photography	1
Drawing	1
Digital Art	1

5 rows in set (0.00 sec)

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

```
mysql> SELECT a.*
-> FROM artists a
-> JOIN (
-> SELECT artistid
-> FROM artworks
-> GROUP BY artistid
-> HAVING COUNT(artworkid) > 2
-> ) AS b ON a.artistid = b.artistid;
```

ArtistID	Name	Biography	Nationality
1	John Smith	American landscape painter.	American
2	Linda Johnson	British sculptor specializing in bronze art.	British

2 rows in set (0.00 sec)

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(w.year) AS averageyear
-> FROM categories c
-> JOIN artworks w ON c.categoryid = w.categoryid
-> GROUP BY c.categoryid
-> HAVING COUNT(w.artworkid) > 1;
```

category	averageyear
Painting	1947.3636
Sculpture	2015.8000

2 rows in set (0.00 sec)

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

```
mysql> SELECT a.*
-> FROM artworks a
-> JOIN exhibitionartworks ea ON a.artworkid = ea.artworkid
-> JOIN exhibitions e ON ea.exhibitionid = e.exhibitionid
-> WHERE e.title = 'Modern Art Masterpieces';
```

ArtworkID	Title	ArtistID	CategoryID	Year	Description	ImageURL
1	Mountain Sunset	1	1	2010	A landscape painting of mountains at sunset.	mountain_sunset.jpg
2	Bronze Statue	2	2	2015	A bronze sculpture of a mythological figure.	bronze_statue.jpg
3	Portrait	3	1	2005	A portrait capturing the essence of womanhood.	portrait_woman.jpg
18	Starry Night	15	1	1889	A famous painting by Vincent van Gogh.	starry_night.jpg
21	Mona Lisa	16	1	1503	The iconic portrait by Leonardo da Vinci.	mona_lisa.jpg
31	Guernica	17	1	1937	Pablo Picasso's powerful anti-war mural.	guernica.jpg

6 rows in set (0.00 sec)

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

```
mysql> SELECT c.categoryid, c.name AS category
-> FROM categories c
-> JOIN artworks w ON c.categoryid = w.categoryid
-> GROUP BY c.categoryid, c.name
-> HAVING AVG(w.year) > (SELECT AVG(year) FROM artworks);
```

categoryid	category
2	Sculpture
3	Photography
4	Drawing
5	Digital Art

4 rows in set (0.00 sec)

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

```
mysql> SELECT a.*
-> FROM artworks a
-> LEFT JOIN exhibitionartworks ea ON a.artworkid = ea.artworkid
-> LEFT JOIN exhibitions e ON ea.exhibitionid = e.exhibitionid
-> WHERE ea.artworkid IS NULL OR (a.year < e.startdate OR a.year > e.enddate OR e.exhibitionid IS NULL);
```

ArtworkID	Title	ArtistID	CategoryID	Year	Description
1	Mountain Sunset	1	1	2010	A landscape painting of mountains at sunset.
2	Bronze Statue	2	2	2015	A bronze sculpture of a mythological figure.
3	Portrait	3	1	2005	A portrait capturing the essence of womanhood.
3	Portrait	3	1	2005	A portrait capturing the essence of womanhood.
4	Abstract Art	4	1	2018	An abstract painting combining colors and forms.
5	Urban Photography	5	3	2020	A series of photographs showcasing city life.
6	Miniature Painting	6	1	2012	An intricately detailed miniature painting.
7	Dreamscape	7	1	2017	A surrealistic painting depicting a dreamscape.
8	Sculpture	8	2	2019	A sculpture capturing the harmony between humans and nature.
9	Ink Sketch	9	4	2014	A traditional Chinese ink sketch of a serene landscape.
10	Digital Art	10	5	2021	A vibrant digital artwork bursting with color.

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

```
mysql> SELECT DISTINCT a.*
-> FROM artists a
-> JOIN artworks w ON a.artistid = w.artistid
-> JOIN categories c ON w.categoryid = c.categoryid
-> WHERE c.categoryid = (SELECT categoryid FROM artworks WHERE title = 'Mona Lisa');
```

ArtistID	Name	Biography	Nationality
1	John Smith	American landscape painter.	American
3	Raj Patel	Indian portrait artist.	Indian
4	Anita Gupta	Renowned Indian abstract painter.	Indian
6	Sarah Khan	Pakistani painter of intricate miniature art.	Pakistani
7	Michael Brown	Australian surrealist artist.	Australian
15	Vincent van Gogh	Dutch post-impressionist painter.	Dutch
16	Leonardo da Vinci	Italian polymath of the Renaissance.	Italian
17	Pablo Picasso	Renowned Spanish painter and sculptor.	Spanish

8 rows in set (0.01 sec)

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

```
mysql> SELECT a.name, COUNT(w.artworkid) AS artworkcount
-> FROM artists a
-> LEFT JOIN artworks w ON a.artistid = w.artistid
-> GROUP BY a.name;
```

name	artworkcount
John Smith	4
Linda Johnson	4
Raj Patel	1
Anita Gupta	1
David Lee	1
Sarah Khan	1
Michael Brown	1
Priya Sharma	1
Robert Chen	1
Maria Fernandez	1
Vincent van Gogh	1
Leonardo da Vinci	1
Pablo Picasso	1

13 rows in set (0.00 sec)