

Virtual Art Gallery

Coding Challenge SQL

Creating database named Virtual_Art_Gallery :

```
mysql> create database Virtual_Art_Gallery;  
Query OK, 1 row affected (0.42 sec)
```

Creating Artists table :

```
mysql> create table artists (  
-> artist_id int primary key,  
-> name varchar(255) not null,  
-> biography text,  
-> nationality varchar(100)  
-> );  
Query OK, 0 rows affected (2.04 sec)
```

Field	Type	Null	Key	Default	Extra
artist_id	int	NO	PRI	NULL	
name	varchar(255)	NO		NULL	
biography	text	YES		NULL	
nationality	varchar(100)	YES		NULL	

4 rows in set (0.27 sec)

Creating Categories table :

```
mysql> create table categories (  
-> category_id int primary key,  
-> name varchar(100) not null  
-> );  
Query OK, 0 rows affected (0.43 sec)
```

Field	Type	Null	Key	Default	Extra
category_id	int	NO	PRI	NULL	
name	varchar(100)	NO		NULL	

2 rows in set (0.00 sec)

Creating Artworks table :

```
mysql> create table artworks (  
-> artwork_id int primary key,  
-> title varchar(255) not null,  
-> artist_id int,  
-> category_id int,  
-> year int,  
-> description text,  
-> image_url varchar(255),  
-> Foreign key(artist_id) references artists(artist_id),  
-> Foreign key(category_id) references categories(category_id)  
-> );  
Query OK, 0 rows affected (2.24 sec)
```

Field	Type	Null	Key	Default	Extra
artwork_id	int	NO	PRI	NULL	
title	varchar(255)	NO		NULL	
artist_id	int	YES	MUL	NULL	
category_id	int	YES	MUL	NULL	
year	int	YES		NULL	
description	text	YES		NULL	
image_url	varchar(255)	YES		NULL	

7 rows in set (0.00 sec)

Creating Exhibitions table :

```
mysql> create table exhibitions (  
-> exhibition_id int primary key,  
-> title varchar(255) not null,  
-> start_date date,  
-> end_date date,  
-> description text  
-> );  
Query OK, 0 rows affected (0.70 sec)
```

Field	Type	Null	Key	Default	Extra
exhibition_id	int	NO	PRI	NULL	
title	varchar(255)	NO		NULL	
start_date	date	YES		NULL	
end_date	date	YES		NULL	
description	text	YES		NULL	

5 rows in set (0.00 sec)

Create a table to associate artworks with exhibitions :

```
mysql> create table exhibition_artworks (  
  -> exhibition_id int,  
  -> artwork_id int,  
  -> primary key(exhibition_id, artwork_id),  
  -> Foreign key(exhibition_id) references exhibitions (exhibition_id),  
  -> Foreign key(artwork_id) references artworks(artwork_id)  
  -> );  
Query OK, 0 rows affected (0.62 sec)
```

```
+-----+-----+-----+-----+-----+-----+  
| Field          | Type | Null | Key | Default | Extra |  
+-----+-----+-----+-----+-----+-----+  
| exhibition_id  | int  | NO   | PRI | NULL    |       |  
| artwork_id    | int  | NO   | PRI | NULL    |       |  
+-----+-----+-----+-----+-----+-----+  
2 rows in set (0.00 sec)
```

Inserting the sample data into the Artists table :

```
mysql> insert into artists (artist_id, 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');  
Query OK, 3 rows affected (0.22 sec)  
Records: 3 Duplicates: 0 Warnings: 0
```

```
+-----+-----+-----+-----+  
| artist_id | 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    |  
+-----+-----+-----+-----+  
3 rows in set (0.00 sec)
```

Inserting the sample data into the Categories table :

```
mysql> insert into categories (category_id, name) values
-> (1, 'Painting'),
-> (2, 'Sculpture'),
-> (3, 'Photography');
Query OK, 3 rows affected (0.14 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
+-----+-----+
| category_id | name      |
+-----+-----+
|          1 | Painting  |
|          2 | Sculpture |
|          3 | Photography |
+-----+-----+
3 rows in set (0.00 sec)
```

Inserting the sample data into the Artworks table :

```
mysql> insert into artworks (artwork_id, title, artist_id, category_id, year, description, image_url) 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');
Query OK, 3 rows affected (0.10 sec)
Records: 3  Duplicates: 0  Warnings: 0
```

```
+-----+-----+-----+-----+-----+-----+-----+
| artwork_id | title      | artist_id | category_id | year | description                                     | image_url      |
+-----+-----+-----+-----+-----+-----+-----+
|          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    |
+-----+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

Inserting the sample data into the Exhibitions table:

```
mysql> insert into exhibitions (exhibition_id, title, start_date, end_date, 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.');
```

Query OK, 2 rows affected (0.09 sec)
Records: 2 Duplicates: 0 Warnings: 0

exhibition_id	title	start_date	end_date	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.

2 rows in set (0.00 sec)

Inserting artworks into exhibitions :

```
mysql> insert into exhibition_artworks (exhibition_id, artwork_id) values
-> (1, 1),
-> (1, 2),
-> (1, 3),
-> (2, 2);
```

Query OK, 4 rows affected (0.17 sec)
Records: 4 Duplicates: 0 Warnings: 0

exhibition_id	artwork_id
1	1
1	2
2	2
1	3

4 rows in set (0.00 sec)

1) Retrieving 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 name, (select count(*) from artworks where artists.artist_id = artworks.artist_id) as artwork_count
-> from artists order by artwork_count desc;
+-----+-----+
| name          | artwork_count |
+-----+-----+
| Pablo Picasso | 1             |
| Vincent van Gogh | 1           |
| Leonardo da Vinci | 1           |
+-----+-----+
3 rows in set (0.12 sec)
```

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

```
mysql> select title from artworks
-> where artist_id in
-> (select artist_id from artists where nationality in ('Spanish', 'Dutch'))
-> order by year asc;
+-----+
| title          |
+-----+
| Starry Night   |
| Guernica       |
+-----+
2 rows in set (0.06 sec)
```

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

```
mysql> select name,
-> (select count(*) from artworks where artists.artist_id = artworks.artist_id and
-> category_id = (select category_id from categories where name = 'Painting')) as painting_count
-> from artists;
+-----+-----+
| name          | painting_count |
+-----+-----+
| Pablo Picasso | 1             |
| Vincent van Gogh | 1           |
| Leonardo da Vinci | 1           |
+-----+-----+
3 rows in set (0.10 sec)
```

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

```
mysql> select artworks.title,  
-> (select artists.name from artists where artists.artist_id = artworks.artist_id) as artist,  
-> (select categories.name from categories where categories.category_id = artworks.category_id)  
-> as category from artworks  
-> where artworks.artwork_id in (  
-> select exhibition_artworks.artwork_id from exhibition_artworks where exhibition_artworks.exhibition_id in (  
-> select exhibitions.exhibition_id from exhibitions where exhibitions.title = 'Modern Art Masterpieces'));
```

title	artist	category
Starry Night	Vincent van Gogh	Painting
Mona Lisa	Leonardo da Vinci	Painting
Guernica	Pablo Picasso	Painting

```
3 rows in set (0.10 sec)
```

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

```
mysql> select name from artists  
-> where artist_id in  
-> (select artist_id from artworks group by artist_id having count(*) > 2);  
Empty set (0.09 sec)
```

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

```
mysql> select title  
-> from artworks where artwork_id in  
-> (select artwork_id from exhibition_artworks where exhibition_id in  
-> (select exhibition_id from exhibitions where title = 'Modern Art Masterpieces'))  
-> and artwork_id in  
-> (select artwork_id from exhibition_artworks where exhibition_id in  
-> (select exhibition_id from exhibitions where title = 'Renaissance Art'));
```

title
Mona Lisa

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

7) Finding the total number of artworks in each category.

```
mysql> select name,  
-> (select count(*) from artworks where category_id = categories.category_id)  
-> as artwork_count from categories;  
+-----+-----+  
| name      | artwork_count |  
+-----+-----+  
| Painting  | 3             |  
| Sculpture | 0             |  
| Photography | 0           |  
+-----+-----+  
3 rows in set (0.05 sec)
```

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

```
mysql> select name from artists  
-> where artist_id in  
-> (select artist_id from artworks group by artist_id having count(*) > 3);  
Empty set (0.01 sec)
```

9) Finding the artworks created by artists from a specific nationality.

```
mysql> select title from artworks  
-> where artist_id in  
-> (select artist_id from artists where Nationality = 'Spanish');  
+-----+  
| title      |  
+-----+  
| Guernica   |  
+-----+  
1 row in set (0.00 sec)
```

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


```
mysql> select title from exhibitions
-> where exhibition_id in
-> (select exhibition_id from exhibition_artworks where artwork_id in
-> (select artwork_id from artworks where artist_id in
-> (select artist_id from artists where name in ('Vincent van Gogh', 'Leonardo da Vinci')))
-> group by artwork_id having count(*) = 2));
Empty set (0.05 sec)
```

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

```
mysql> select title from artworks
-> where artwork_id not in
-> (select artwork_id from exhibition_artworks);
Empty set (0.00 sec)
```

12) Listing artists who have created artworks in all available categories.

```
mysql> select name from artists
-> where (select count(distinct category_id) from artworks
-> where artists.artist_id = artworks.artist_id) =
-> (select count(*) from categories);
Empty set (0.22 sec)
```

13) Listing the total number of artworks in each category.

```
mysql> select categories.name, count(artworks.artwork_id)
-> as total_artworks from categories
-> left join artworks on
-> categories.category_id = artworks.category_id
-> group by categories.name;
+-----+-----+
| name      | total_artworks |
+-----+-----+
| Painting  | 3              |
| Sculpture | 0              |
| Photography | 0              |
+-----+-----+
3 rows in set (0.00 sec)
```

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

```
mysql> select name from artists
-> where
-> (select count(*) from artworks
-> where artists.artist_id = artworks.artist_id) > 2;
Empty set (0.00 sec)
```

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

```
mysql> select
  -> (select name from categories where category_id = artworks.category_id) as category,
  -> avg(year) as average_year from artworks
  -> where category_id in (select category_id from artworks
  -> group by category_id having count(*) > 1)
  -> group by category;
+-----+-----+
| category | average_year |
+-----+-----+
| Painting | 1776.3333 |
+-----+-----+
1 row in set (0.05 sec)
```

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

```
mysql> select title from artworks
  -> where artwork_id in (select artwork_id from exhibition_artworks
  -> where exhibition_id = (select exhibition_id from exhibitions
  -> where title = 'Modern Art Masterpieces'));
+-----+
| title |
+-----+
| Starry Night |
| Mona Lisa |
| Guernica |
+-----+
3 rows in set (0.00 sec)
```

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

```
mysql> select
  -> (select name from categories where category_id = artworks.category_id)
  -> as category, avg(year) as category_average_year from artworks
  -> group by category_id
  -> having avg(year) > (select avg(year) from artworks);
Empty set (0.00 sec)
```

18) Listing the artworks that were not exhibited in any exhibition.

```
mysql> select title from artworks
-> where artwork_id not in
-> (select artwork_id from exhibition_artworks);
Empty set (0.00 sec)
```

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

```
mysql> select name from artists
-> where artist_id in
-> (select artist_id from artworks where
-> category_id = (select category_id
-> from artworks where title = 'Mona Lisa'));
+-----+
| name          |
+-----+
| Pablo Picasso |
| Vincent van Gogh |
| Leonardo da Vinci |
+-----+
3 rows in set (0.00 sec)
```

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

```
mysql> select name,(select count(*) from artworks
-> where artists.artist_id = artworks.artist_id)
-> as artwork_count from artists;
+-----+-----+
| name          | artwork_count |
+-----+-----+
| Pablo Picasso | 1             |
| Vincent van Gogh | 1             |
| Leonardo da Vinci | 1             |
+-----+-----+
3 rows in set (0.00 sec)
```

