Virtual Art Gallery

Coding Challenge SQL

Creating database named VirtualArtGallery :

```
mysql> create database VirtualArtGallery;
Query OK, 1 row affected (0.04 sec)
```

Creating Artists table :

CREATE TABLE Artists (

ArtistID INT PRIMARY KEY,

Name VARCHAR(255) NOT NULL,

Biography TEXT,

Nationality VARCHAR(100)

);

```
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    |       |
+-------------+--------------+------+-----+---------+-------+
4 rows in set (0.09 sec)
```

Creating Categories table :

CREATE TABLE Categories (

CategoryID INT PRIMARY KEY,

Name VARCHAR(100) NOT NULL

);

```
mysql> desc categories;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| CategoryID | int          | NO   | PRI | NULL    |       |
| Name       | varchar(100) | NO   |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
2 rows in set (0.06 sec)
```

Creating 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));

```
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    |       |
+-------------+--------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

Creating Exhibitions table :

CREATE TABLE Exhibitions (

ExhibitionID INT PRIMARY KEY,

Title VARCHAR(255) NOT NULL,

StartDate DATE,

EndDate DATE,

Description TEXT);

```
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    |       |
+-------------+--------------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

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));

```
mysql> desc exhibitionartworks;
+-------------+------+------+-----+---------+-------+
| Field       | Type | Null | Key | Default | Extra |
+-------------+------+------+-----+---------+-------+
| ExhibitionID | int | NO   | PRI | NULL    |       |
| ArtworkID   | int  | NO   | PRI | NULL    |       |
+-------------+------+------+-----+---------+-------+
2 rows in set (0.01 sec)
```

Inserting the 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');

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

Inserting the sample data into the Categories table :

INSERT INTO Categories (CategoryID, Name) VALUES (1, 'Painting'),

(2, 'Sculpture'),

(3, 'Photography');

```
mysql> select * from categories;
+------------+-------------+
| CategoryID | Name        |
+------------+-------------+
|          1 | Painting    |
|          2 | Sculpture   |
|          3 | Photography |
+------------+-------------+
3 rows in set (0.00 sec)
```

Inserting the 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');

```
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   |
+----------+-------------+----------+------------+------+----------------------------------------+-----------------+
3 rows in set (0.06 sec)
```

Inserting the 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.');

```
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. |
+--------------+------------------------+------------+------------+----------------------------------------+
2 rows in set (0.00 sec)
```

Inserting artworks into exhibitions :

INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES (1, 1), (1, 2), (1, 3), (2, 2);

```
mysql> select * from exhibitionartworks;
+--------------+-----------+
| ExhibitionID | ArtworkID |
+--------------+-----------+
|            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.

select name,(select count(*) from artworks where artists.artistid=artworks.artistid)

as artwork_count from artists order by artwork_count desc;

```
mysql> select name,(select count(*) from artworks where artists.artistid=artworks.artistid) 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 (0.06 sec)
```

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

select title from artworks where artistid in

(select artistid from artists where nationality in ('Spanish','Dutch')) order by year;

```
mysql> select title from artworks where artistid in
    -> (select artistid from artists where nationality in ('Spanish','Dutch'))
    -> order by year;
+--------------+
| title        |
+--------------+
| Starry Night |
| Guernica     |
+--------------+
2 rows in set (0.00 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.

select name,

(select count(*) from artworks where artists.artistid=artworks.artistid and

categoryid=(select categoryid from categories where name='Painting'))

as painting_count from artists;

```
mysql> select name,
    -> (select count(*) from artworks where artists.artistid=artworks.artistid and
    -> categoryid=(select categoryid 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 (0.06 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.artistid = artworks.artistid) as artist,
    -> (select categories.name from categories where categories.categoryid = artworks.categoryid)
    -> as category from artworks
    -> where artworks.artworkid in (
    -> select exhibitionartworks.artworkid from exhibitionartworks where exhibitionartworks.exhibitionid in (
    -> select exhibitions.exhibitionid from exhibitions where exhibitions.title = 'Modern Art Masterpieces '));
Empty set (0.00 sec)
```

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

```
mysql> select name from artists where artistid in
    -> (select artistid from artworks group by artistid having count(*)>2);
Empty set (0.00 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 artworkid in
    -> (select artworkid from exhibitionartworks where exhibitionid in
    -> (select exhibitionid from exhibitions where title='Modern Art Masterpieces'))
    -> and artworkid in (select artworkid from exhibitionartworks where exhibitionid in
    -> (select exhibitionid from exhibitions where title='Renaissance Art'));
+-----------+
| title     |
+-----------+
| Mona Lisa |
+-----------+
1 row in set (0.06 sec)
```

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

```
mysql> select name,(select count(*) from artworks
    -> where categoryid=categories.categoryid) as artwork_count
    -> from categories;
+-------------+---------------+
| name        | artwork_count |
+-------------+---------------+
| Painting    |             3 |
| Sculpture   |             0 |
| Photography |             0 |
+-------------+---------------+
3 rows in set (0.00 sec)
```

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

```
mysql> select name from artists where artistid in
    -> (select artistid from artworks group by
    ->  artistid having count(*)>3);
Empty set (0.00 sec)
```

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

```
mysql> select * from artworks where artistid in
    -> (select artistid from artists where nationality='Spanish');
+----------+----------+----------+------------+------+------------------------
| ArtworkID | Title    | ArtistID | CategoryID | Year | Description
+----------+----------+----------+------------+------+------------------------
|        3 | Guernica |        1 |          1 | 1937 | Pablo Picasso's powerful
+----------+----------+----------+------------+------+------------------------
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 exhibitionid in
    -> (select exhibitionid from exhibitionartworks where artworkid in
    -> (select artworkid from artworks where artistid in
    -> (select artistid from artists where name in('Vincent van Gogh',
    -> 'Leonardo da vinci'))
    -> group by artworkid having count(*)=2));
Empty set (0.06 sec)
```

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

```
mysql> select * from artworks where artworkid not in
    -> (select distinct(artworkid) from exhibitionartworks);
Empty set (0.06 sec)
```

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

```
mysql> select name from artists where(select count(
    -> distinct categoryid) from artworks where
    -> artists.artistid=artworks.artistid)=(select count(*)
    -> from categories);
Empty set (0.07 sec)
```

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

```
mysql> select categories.name,count(artworks.artworkid) as total_artwork
    -> from categories left join artworks on
    -> categories.categoryid=artworks.categoryid
    -> group by categories.name;
+-------------+---------------+
| name        | total_artwork |
+-------------+---------------+
| 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.artistid=artworks.artistid)>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 categoryid=artworks.categoryid)
    -> as category,avg(year) as avg_year from artworks where
    -> categoryid in (select categoryid from artworks group by
    -> categoryid having count(*)>1) group  by category;
+----------+-----------+
| category | avg_year  |
+----------+-----------+
| Painting | 1776.3333 |
+----------+-----------+
1 row in set (0.07 sec)
```

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

```
mysql> select artworkid,title from artworks where artworkid in
    -> (select artworkid from exhibitionartworks where exhibitionid in
    -> (select exhibitionid from exhibitions where title='Modern Art Masterpieces'));
+----------+-------------+
| artworkid | title       |
+----------+-------------+
|        1 | Starry Night |
|        2 | Mona Lisa   |
|        3 | 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 name from categories where categoryid in
    -> (select categoryid from artworks where year>(select avg(year) from artworks));
+-----------+
| name      |
+-----------+
| Painting  |
+-----------+
1 row in set (0.00 sec)
```

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

```
mysql> select * from artworks where artworkid not in
    -> (select distinct(artworkid) from exhibitionartworks);
Empty set (0.00 sec)
```

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

```
mysql> select artistid,name from artists where artistid in
    -> (select artistid from artworks where categoryid in
    -> (select categoryid from artworks where title='Mona Lisa'));
+----------+-------------------+
| artistid | name              |
+----------+-------------------+
|        1 | Pablo Picasso     |
|        2 | Vincent van Gogh  |
|        3 | 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.artistid=artworks.artistid)
    -> as artworks_count from artists;
+-------------------+----------------+
| name              | artworks_count |
+-------------------+----------------+
| Pablo Picasso     |              1 |
| Vincent van Gogh  |              1 |
| Leonardo da Vinci |              1 |
+-------------------+----------------+
3 rows in set (0.00 sec)
```