

# Coding Challenge SQL Virtual Art Gallery Schema DDL and DML

```
MySQL 8.0 Command Line Client
Query OK, 1 row affected (1.65 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 (5.70 sec)

mysql> INSERT INTO Artists 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 (0.77 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> CREATE TABLE Categories ( CategoryID INT PRIMARY KEY, Name VARCHAR(100) NOT NULL);
Query OK, 0 rows affected (2.71 sec)

mysql> INSERT INTO Categories VALUES (1, 'Painting'), (2, 'Sculpture'), (3, 'Photography');
Query OK, 3 rows affected (0.24 sec)
Records: 3 Duplicates: 0 Warnings: 0

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 (4.43 sec)

mysql> INSERT INTO Artworks 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 (0.72 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql> CREATE TABLE Exhibitions ( ExhibitionID INT PRIMARY KEY, Title VARCHAR(255) NOT NULL, StartDate DATE, EndDate DATE, Description TEXT);
Query OK, 0 rows affected (2.22 sec)

mysql> INSERT INTO Exhibitions 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 8.0 Command Line Client
Query OK, 4 rows affected (0.10 sec)
Records: 4 Duplicates: 0 Warnings: 0

mysql> show tables;
+-----+
| Tables_in_virtualartgallery |
+-----+
| artists                      |
| artworks                    |
| categories                  |
| exhibitionartworks          |
| exhibitions                  |
+-----+
5 rows in set (3.28 sec)

mysql>
```

```
MySQL 8.0 Command Line Client
5 rows in set (3.28 sec)

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 (0.07 sec)

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 (0.02 sec)

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

mysql> select * from exhibitionartworks;
+-----+-----+
| ExhibitionID | ArtworkID |
+-----+-----+
| 1            | 1         |
| 1            | 2         |
| 2            | 2         |
| 2            | 3         |
+-----+-----+
4 rows in set (0.00 sec)

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 (0.03 sec)

mysql>
```

```
MySQL 8.0 Command Line Client

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 (0.02 sec)

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

mysql> select * from exhibitionartworks;
+-----+-----+
| ExhibitionID | ArtworkID |
+-----+-----+
| 1            | 1         |
| 1            | 2         |
| 2            | 2         |
| 2            | 3         |
+-----+-----+
4 rows in set (0.00 sec)

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 (0.03 sec)

mysql>
```

```
MySQL 8.0 Command Line Client
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS artwork_count
-> FROM artists
-> LEFT JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.name
-> ORDER BY artwork_count DESC;
+-----+-----+
| name          | artwork_count |
+-----+-----+
| Pablo Picasso | 1             |
| Vincent van Gogh | 1           |
| Leonardo da Vinci | 1           |
+-----+-----+
3 rows in set (0.02 sec)

mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN artists ON artworks.ArtistID = artists.ArtistID
-> WHERE artists.nationality IN ('Spanish', 'Dutch')
-> ORDER BY artworks.year ASC;
+-----+
| Title          |
+-----+
| Starry Night   |
| Guernica       |
+-----+
2 rows in set (0.00 sec)

mysql>
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE artworks.name= 'Painting'
-> GROUP BY artists.name;
ERROR 1054 (42S22): Unknown column 'artworks.name' in 'where clause'
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE categories.name= 'Painting'
-> GROUP BY artists.name;
ERROR 1054 (42S22): Unknown column 'categories.name' in 'where clause'
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE artworks.categoryID = 'Painting'
```

```
MySQL 8.0 Command Line Client
-> ORDER BY artworks.year ASC;
+-----+
| Title          |
+-----+
| Starry Night   |
| Guernica       |
+-----+
2 rows in set (0.00 sec)

mysql>
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE artworks.name= 'Painting'
-> GROUP BY artists.name;
ERROR 1054 (42S22): Unknown column 'artworks.name' in 'where clause'
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE categories.name= 'Painting'
-> GROUP BY artists.name;
ERROR 1054 (42S22): Unknown column 'categories.name' in 'where clause'
mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE artworks.categoryID = 'Painting'
-> GROUP BY artists.name;
Empty set, 1 warning (0.20 sec)

mysql> SELECT artists.name, COUNT(artworks.ArtworkID) AS painting_count
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE artworks.categoryID = 1
-> GROUP BY artists.name;
+-----+-----+
| name          | painting_count |
+-----+-----+
| Pablo Picasso | 1             |
| Vincent van Gogh | 1           |
| Leonardo da Vinci | 1           |
+-----+-----+
3 rows in set (0.00 sec)

mysql>
```

```
MySQL 8.0 Command Line Client
3 rows in set (0.12 sec)

mysql> SELECT artists.Name
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.Name
-> HAVING COUNT(artworks.ArtworkID) > 2;
Empty set (0.04 sec)

mysql> SELECT artists.Name
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.Name
-> HAVING COUNT(artworks.ArtworkID) >=2;
Empty set (0.03 sec)

mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN exhibitionsartworks ON artworks.ArtworkID = exhibitionsartworks.ArtworkID
-> JOIN exhibitions ON exhibitionsartworks.ExhibitionID = exhibitions.ExhibitionID
-> WHERE exhibitions.name IN ('Modern Art Masterpieces', 'Renaissance Art')
-> GROUP BY artworks.title
-> HAVING COUNT(DISTINCT exhibitions.Title) = 2;
ERROR 1146 (42S02): Table 'virtualartgallery.exhibitionsartworks' doesn't exist
mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN exhibitionartworks ON artworks.ArtworkID = exhibitionartworks.ArtworkID
-> JOIN exhibitions ON exhibitionartworks.ExhibitionID = exhibitions.ExhibitionID
-> WHERE exhibitions.name IN ('Modern Art Masterpieces', 'Renaissance Art')
-> GROUP BY artworks.title
-> HAVING COUNT(DISTINCT exhibitions.Title) = 2;
ERROR 1054 (42S22): Unknown column 'exhibitions.name' in 'where clause'
mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN exhibitionartworks ON artworks.ArtworkID = exhibitionartworks.ArtworkID
-> JOIN exhibitions ON exhibitionartworks.ExhibitionID = exhibitions.ExhibitionID
-> WHERE exhibitions.Title IN ('Modern Art Masterpieces', 'Renaissance Art')
-> GROUP BY artworks.title
-> HAVING COUNT(DISTINCT exhibitions.Title) = 2;
+-----+
| Title |
+-----+
| Mona Lisa |
+-----+
```

```
MySQL 8.0 Command Line Client
+-----+
1 row in set (0.17 sec)

mysql> SELECT categoryID, COUNT(ArtworkID) AS total_count
-> FROM artworks
-> GROUP BY categoryID;
+-----+-----+
| categoryID | total_count |
+-----+-----+
| 1 | 3 |
+-----+-----+
1 row in set (0.03 sec)

mysql> SELECT artists.Name
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.Name
-> HAVING COUNT(artworks.ArtworkID) >=3;
Empty set (0.00 sec)

mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN artists ON artworks.ArtistID = artists.ArtistID
-> WHERE artists.Nationality = 'Spanish';
+-----+
| Title |
+-----+
| Guernica |
+-----+
1 row in set (0.00 sec)

mysql>
```

```
MySQL 8.0 Command Line Client
+-----+
1 row in set (0.03 sec)

mysql> SELECT artists.Name
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.Name
-> HAVING COUNT(artworks.ArtworkID) >=3;
Empty set (0.00 sec)

mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN artists ON artworks.ArtistID = artists.ArtistID
-> WHERE artists.Nationality = 'Spanish';
+-----+
| Title |
+-----+
| Guernica |
+-----+
1 row in set (0.00 sec)

mysql> SELECT exhibitions.Title
-> FROM exhibitions
-> JOIN exhibitionartworks ON exhibitions.ExhibitionID = exhibitionartworks.ExhibitionID
-> JOIN artworks ON exhibitions_artworks.artwork_id = artworks.artwork_id
-> JOIN artists ON artworks.ArtistID = artists.ArtistID
-> WHERE artists.Name IN ('Vincent van Gogh', 'Leonardo da Vinci')
-> GROUP BY exhibitions.Title
-> HAVING COUNT(DISTINCT artists.Name) = 2;
ERROR 1054 (42S22): Unknown column 'exhibitions_artworks.artwork_id' in 'on clause'

mysql> SELECT exhibitions.Title
-> FROM exhibitions
-> JOIN exhibitionartworks ON exhibitions.ExhibitionID = exhibitionartworks.ExhibitionID
-> JOIN artworks ON exhibitions_artworks.artwork_id = artworks.artwork_id
-> JOIN artists ON artworks.ArtistID = artists.ArtistID
-> WHERE artists.Name IN ('Vincent van Gogh', 'Leonardo da Vinci')
-> GROUP BY exhibitions.Title
-> HAVING COUNT(DISTINCT artists.Name) = 2;
+-----+
| Title |
+-----+
| Modern Art Masterpieces |
+-----+
1 row in set (0.02 sec)
```

```
MySQL 8.0 Command Line Client

mysql> SELECT artists.Name
-> FROM artists
-> CROSS JOIN (SELECT DISTINCT CategoryID FROM artworks) AS all_categories
-> LEFT JOIN artworks ON artists.ArtistID = artworks.ArtistID AND artworks.CategoryID = all_categories.CategoryID
-> GROUP BY artists.Name
-> HAVING COUNT(DISTINCT artworks.CategoryID) = (SELECT COUNT(DISTINCT CategoryID) FROM artworks);
+-----+
| Name |
+-----+
| Leonardo da Vinci |
| Pablo Picasso |
| Vincent van Gogh |
+-----+
3 rows in set (0.17 sec)

mysql> SELECT CategoryID, COUNT(ArtworkID) AS total_count
-> FROM artworks
-> GROUP BY CategoryID;
+-----+
| CategoryID | total_count |
+-----+
| 1 | 3 |
+-----+
1 row in set (0.00 sec)

mysql> SELECT artists.Name
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.Name
-> HAVING COUNT(artworks.ArtworkID) >2;
Empty set (0.00 sec)

mysql> SELECT CategoryID, AVG(year) AS average_year
-> FROM artworks
-> GROUP BY CategoryID
-> HAVING COUNT(ArtworkID) > 1;
+-----+
| CategoryID | average_year |
+-----+
| 1 | 1776.3333 |
+-----+
1 row in set (0.04 sec)

mysql>
```

```
MySQL 8.0 Command Line Client
ERROR 1054 (42S22): Unknown column 'artworks.artwork_id' in 'on clause'
mysql> SELECT artworks.Title
-> FROM artworks
-> JOIN exhibitionartworks ON artworks.ArtworkID = exhibitionartworks.ArtworkID
-> JOIN exhibitions ON exhibitionartworks.ExhibitionID = exhibitions.ExhibitionID
-> WHERE exhibitions.Title = 'Modern Art Masterpieces';
+-----+
| Title |
+-----+
| Starry Night |
| Mona Lisa |
| Guernica |
+-----+
3 rows in set (0.00 sec)

mysql> SELECT CategoryID
-> FROM artworks
-> GROUP BY categoryID
-> HAVING AVG(year) > (SELECT AVG(year) FROM artworks);
Empty set (0.00 sec)

mysql> SELECT artworks.Title
-> FROM artworks
-> WHERE artworks.ArtworkID NOT IN (SELECT ArtworkID FROM exhibitionartworks);
Empty set (0.00 sec)

mysql> SELECT artists.Name
-> FROM artists
-> JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> WHERE artworks.CategoryID IN (SELECT CategoryID FROM artworks WHERE title = 'Mona Lisa')
-> AND artists.Name <> (SELECT artists.Name FROM artists JOIN artworks ON artists.ArtistID = artworks.ArtistID WHERE artworks.Title = 'Mona Lisa');
+-----+
| Name |
+-----+
| Pablo Picasso |
| Vincent van Gogh |
+-----+
2 rows in set (0.07 sec)

mysql>
mysql>
```

```
MySQL 8.0 Command Line Client
mysql>
mysql> SELECT artists.Name, COUNT(artworks.ArtworkID) AS artwork_count
-> FROM artists
-> LEFT JOIN artworks ON artists.ArtistID = artworks.ArtistID
-> GROUP BY artists.Name;
+-----+-----+
| Name | artwork_count |
+-----+-----+
| Pablo Picasso | 1 |
| Vincent van Gogh | 1 |
| Leonardo da Vinci | 1 |
+-----+-----+
3 rows in set (0.00 sec)

mysql>
```