Coding Challenge SQL

Virtual Art Gallery Shema DDL and DML

```sql
CREATE DATABASE VirtualArtGallery;

use virtualartgallery;

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

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

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)
);

CREATE TABLE Exhibitions (
    ExhibitionID INT PRIMARY KEY,
    Title VARCHAR(255) NOT NULL,
    StartDate DATE,
    EndDate DATE,
    Description TEXT
);

CREATE TABLE ExhibitionArtworks (
    ExhibitionID INT,
    ArtworkID INT,
    PRIMARY KEY (ExhibitionID, ArtworkID),
    FOREIGN KEY (ExhibitionID) REFERENCES Exhibitions (ExhibitionID),
    FOREIGN KEY (ArtworkID) REFERENCES Artworks (ArtworkID)
);

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');

INSERT INTO Categories (CategoryID, Name) VALUES
(1, 'Painting'),
(2, 'Sculpture'),
(3, 'Photography');

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');

 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.');

INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES
 (1, 1),
 (1, 2),
 (1, 3),
 (2, 2);
```
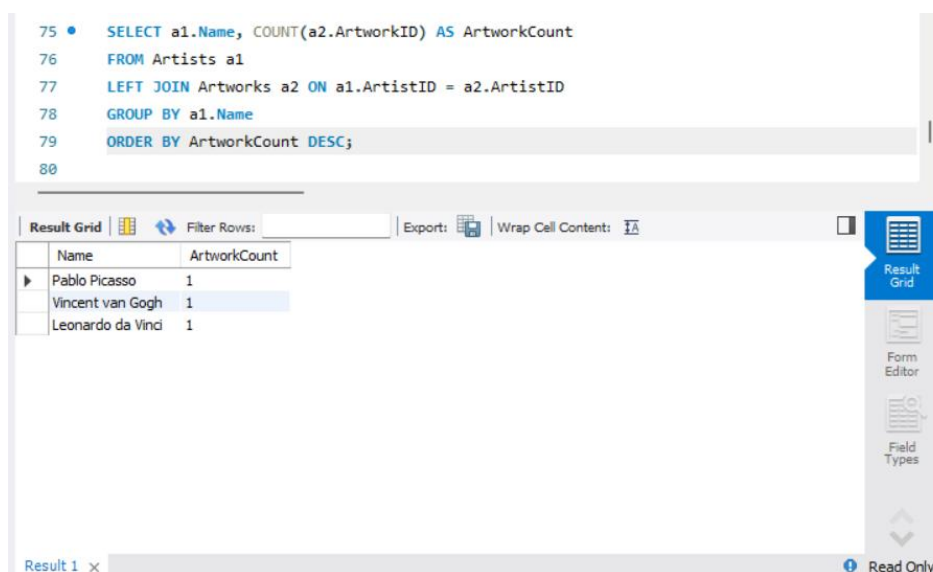
1. Retrieve the names of all artists along with the number of artworks they have
in the gallery, and
list them in descending order of the number of artworks

```
SELECT a1.Name, COUNT(a2.ArtworkID) AS ArtworkCount
FROM Artists a1
LEFT JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
GROUP BY a1.Name
ORDER BY ArtworkCount DESC;
```


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

```
SELECT a1.Title, a1.Year
FROM Artworks a1
JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
WHERE a2.Nationality IN ('Spanish', 'Dutch')
ORDER BY a1.Year ASC;
```

```
81 •    SELECT a1.Title, a1.Year
82      FROM Artworks a1
83      JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
84      WHERE a2.Nationality IN ('Spanish', 'Dutch')
85      ORDER BY a1.Year ASC;
86
```

Title	Year
▶ Starry Night	1889
Guernica	1937

Result 2 ✕   ℹ Read Only

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

```
SELECT a.Name, COUNT(a1.ArtworkID) AS TotalPaintings
FROM Artists a
JOIN Artworks a1 ON a.ArtistID = a1.ArtistID
JOIN Categories c ON a1.CategoryID = c.CategoryID
WHERE c.Name = 'Painting'
GROUP BY a.Name;
```

```
95 •    SELECT a.Name, COUNT(a1.ArtworkID) AS TotalPaintings
96      FROM Artists a
97      JOIN Artworks a1 ON a.ArtistID = a1.ArtistID
98      JOIN Categories c ON a1.CategoryID = c.CategoryID
99      WHERE c.Name = 'Painting'
100     GROUP BY a.Name;
101
```
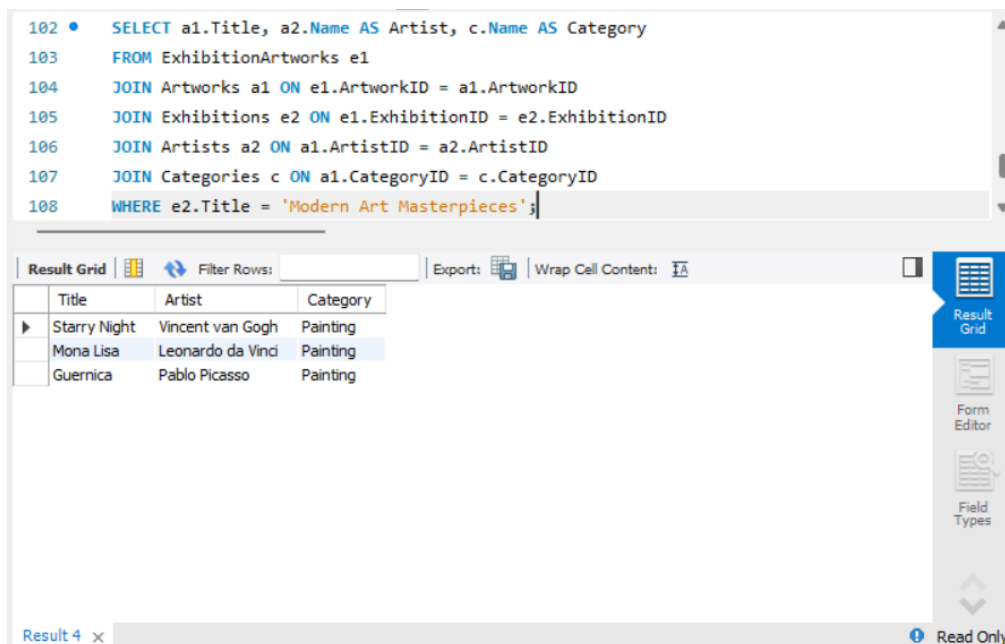
Name	TotalPaintings
▶ Vincent van Gogh	1
Leonardo da Vinci	1
Pablo Picasso	1

Result 3 ✕   ℹ Read Only

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

```
SELECT a1.Title, a2.Name AS Artist, c.Name AS Category
FROM ExhibitionArtworks e1
JOIN Artworks a1 ON e1.ArtworkID = a1.ArtworkID
JOIN Exhibitions e2 ON e1.ExhibitionID = e2.ExhibitionID
JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
JOIN Categories c ON a1.CategoryID = c.CategoryID
WHERE e2.Title = 'Modern Art Masterpieces';
```
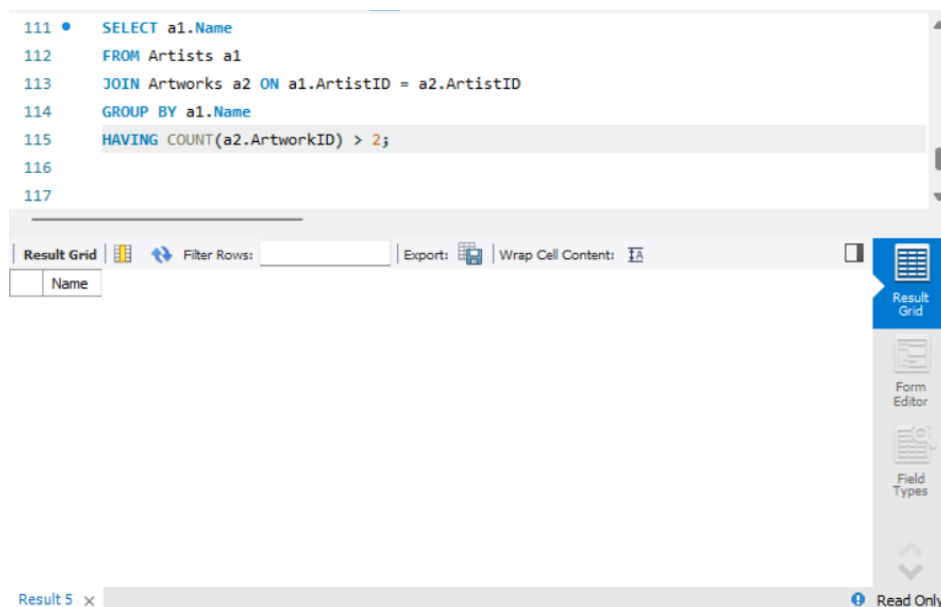
```
102 •    SELECT a1.Title, a2.Name AS Artist, c.Name AS Category
103      FROM ExhibitionArtworks e1
104      JOIN Artworks a1 ON e1.ArtworkID = a1.ArtworkID
105      JOIN Exhibitions e2 ON e1.ExhibitionID = e2.ExhibitionID
106      JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
107      JOIN Categories c ON a1.CategoryID = c.CategoryID
108      WHERE e2.Title = 'Modern Art Masterpieces';
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Title	Artist	Category
Starry Night	Vincent van Gogh	Painting
Mona Lisa	Leonardo da Vinci	Painting
Guernica	Pablo Picasso	Painting

Result 4 ×   Read Only

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

```
SELECT a1.Name
FROM Artists a1
JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
GROUP BY a1.Name
HAVING COUNT(a2.ArtworkID) > 2;
```

```
111 •    SELECT a1.Name
112      FROM Artists a1
113      JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
114      GROUP BY a1.Name
115      HAVING COUNT(a2.ArtworkID) > 2;
116
117
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Name

Result 5 ×   Read Only

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

```
SELECT a.Title
FROM ExhibitionArtworks e1
JOIN ExhibitionArtworks e2 ON e1.ArtworkID = e2.ArtworkID
JOIN Artworks a ON e1.ArtworkID = a.ArtworkID
JOIN Exhibitions ex1 ON e1.ExhibitionID = ex1.ExhibitionID
JOIN Exhibitions ex2 ON e2.ExhibitionID = ex2.ExhibitionID
WHERE ex1.Title = 'Modern Art Masterpieces'
AND ex2.Title = 'Renaissance Art';
```

```
174 •   SELECT a.Title
175     FROM ExhibitionArtworks e1
176     JOIN ExhibitionArtworks e2 ON e1.ArtworkID = e2.ArtworkID
177     JOIN Artworks a ON e1.ArtworkID = a.ArtworkID
178     JOIN Exhibitions ex1 ON e1.ExhibitionID = e1.ExhibitionID
179     JOIN Exhibitions ex2 ON e2.ExhibitionID = ex2.ExhibitionID
```

Title
Mona Lisa
Mona Lisa

Result 15 ✕   ❶ Read Only

7. Find the total number of artworks in each category

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

```
117 •   SELECT c.Name AS Category, COUNT(a.ArtworkID) AS TotalArtworks
118     FROM Categories c
119     LEFT JOIN Artworks a ON c.CategoryID = a.CategoryID
120     GROUP BY c.Name;
121
122
```

Category	TotalArtworks
Painting	3
Sculpture	0
Photography	0

Result 6 ✕   ❶ Read Only

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

```sql
SELECT a1.Name
FROM Artists a1
JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
GROUP BY a1.Name
HAVING COUNT(a2.ArtworkID) > 3;
```

```
122 •    SELECT a1.Name
123      FROM Artists a1
124      INNER JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
125      GROUP BY a1.Name
126      HAVING COUNT(a2.ArtworkID) > 3;
127
128
```

Name

Result 7 ×   ● Read Only

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

```sql
SELECT a1.Title
FROM Artworks a1
JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
WHERE a2.Nationality = 'Spanish';
```

```
129 •    SELECT a1.Title
130      FROM Artworks a1
131      JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
132      WHERE a2.Nationality = 'Spanish';
133
134
```

Title
Guernica

Result 8 ×   ● Read Only

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

```
SELECT a.Title
FROM Artworks a
LEFT JOIN ExhibitionArtworks e ON a.ArtworkID = e.ArtworkID
WHERE e.ArtworkID IS NULL;
```

```
142 •    SELECT a.Title
143      FROM Artworks a
144      LEFT JOIN ExhibitionArtworks e ON a.ArtworkID = e.ArtworkID
145      WHERE e.ArtworkID IS NULL;
146
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
Title

Result 10 ×   Read Only

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

```
SELECT a1.Name
FROM Artists a1
JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
JOIN Categories c ON a2.CategoryID = c.CategoryID
GROUP BY a1.Name
HAVING COUNT(DISTINCT c.CategoryID) = (SELECT COUNT(*) FROM Categories);
```

```
135 •    SELECT a1.Name
136      FROM Artists a1
137      JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
138      JOIN Categories c ON a2.CategoryID = c.CategoryID
139      GROUP BY a1.Name
140      HAVING COUNT(DISTINCT c.CategoryID) = (SELECT COUNT(*) FROM Categories);
141
```

Result Grid	Filter Rows:	Export:	Wrap Cell Content:
Name

Result 9 ×   Read Only

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

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

```
117 •    SELECT c.Name AS Category, COUNT(a.ArtworkID) AS TotalArtworks
118      FROM Categories c
119      LEFT JOIN Artworks a ON c.CategoryID = a.CategoryID
120      GROUP BY c.Name;
121
122
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Result Grid

Category	TotalArtworks
▶ Painting	3
Sculpture	0
Photography	0

Form Editor

Field Types

Result 6 ✕   ℹ Read Only

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

```
SELECT a1.Name
FROM Artists a1
JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
GROUP BY a1.Name
HAVING COUNT(a2.ArtworkID) > 2;
```

```
111 •    SELECT a1.Name
112      FROM Artists a1
113      JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
114      GROUP BY a1.Name
115      HAVING COUNT(a2.ArtworkID) > 2;
116
117
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Result Grid

Name

Form Editor

Field Types

Result 5 ✕   ℹ Read Only

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

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


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

```
SELECT a1.Title, a2.Name AS Artist, c.Name AS Category
FROM ExhibitionArtworks e1
JOIN Artworks a1 ON e1.ArtworkID = a1.ArtworkID
JOIN Exhibitions e2 ON e1.ExhibitionID = e2.ExhibitionID
JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
JOIN Categories c ON a1.CategoryID = c.CategoryID
WHERE e2.Title = 'Modern Art Masterpieces';
```

```
102 ●   SELECT a1.Title, a2.Name AS Artist, c.Name AS Category
103     FROM ExhibitionArtworks e1
104     JOIN Artworks a1 ON e1.ArtworkID = a1.ArtworkID
105     JOIN Exhibitions e2 ON e1.ExhibitionID = e2.ExhibitionID
106     JOIN Artists a2 ON a1.ArtistID = a2.ArtistID
107     JOIN Categories c ON a1.CategoryID = c.CategoryID
108     WHERE e2.Title = 'Modern Art Masterpieces';
```

Title	Artist	Category
Starry Night	Vincent van Gogh	Painting
Mona Lisa	Leonardo da Vinci	Painting
Guernica	Pablo Picasso	Painting

Result 4

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

```
SELECT c.Name
FROM Categories c
JOIN Artworks art ON c.CategoryID = art.CategoryID
GROUP BY c.Name
HAVING AVG(art.Year) > (SELECT AVG(Year) FROM Artworks);
```

```
167 ●   SELECT c.Name
168     FROM Categories c
169     JOIN Artworks a ON c.CategoryID = a.CategoryID
170     GROUP BY c.Name
171     HAVING AVG(a.Year) > (SELECT AVG(Year) FROM Artworks);
172
173
```
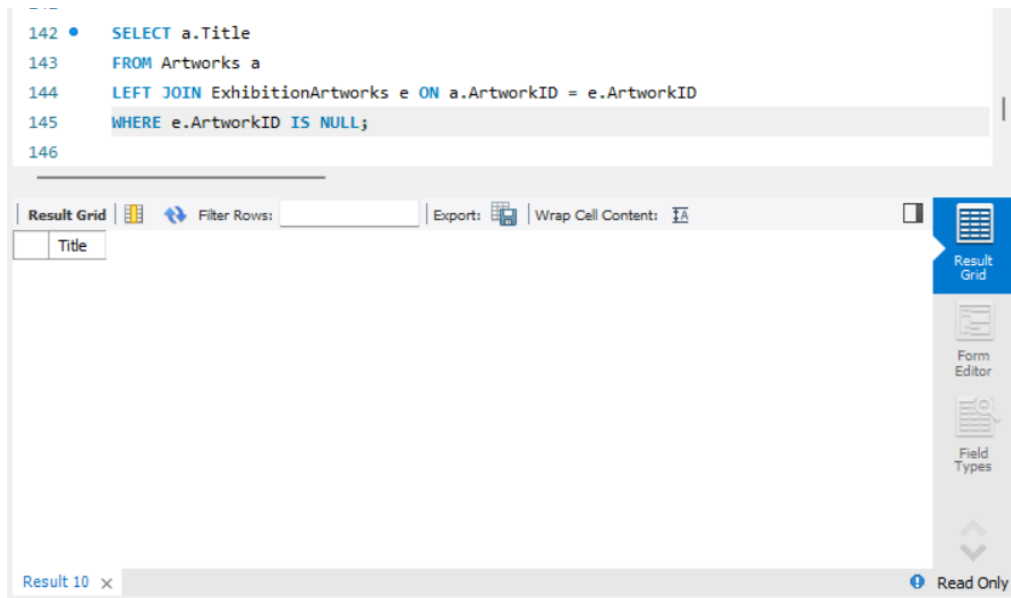
Name

Result 14

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

```
SELECT a.Title
FROM Artworks a
LEFT JOIN ExhibitionArtworks e ON a.ArtworkID = e.ArtworkID
WHERE e.ArtworkID IS NULL;
```

```
142 •   SELECT a.Title
143     FROM Artworks a
144     LEFT JOIN ExhibitionArtworks e ON a.ArtworkID = e.ArtworkID
145     WHERE e.ArtworkID IS NULL;
146
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: 𝐼𝐴

Title

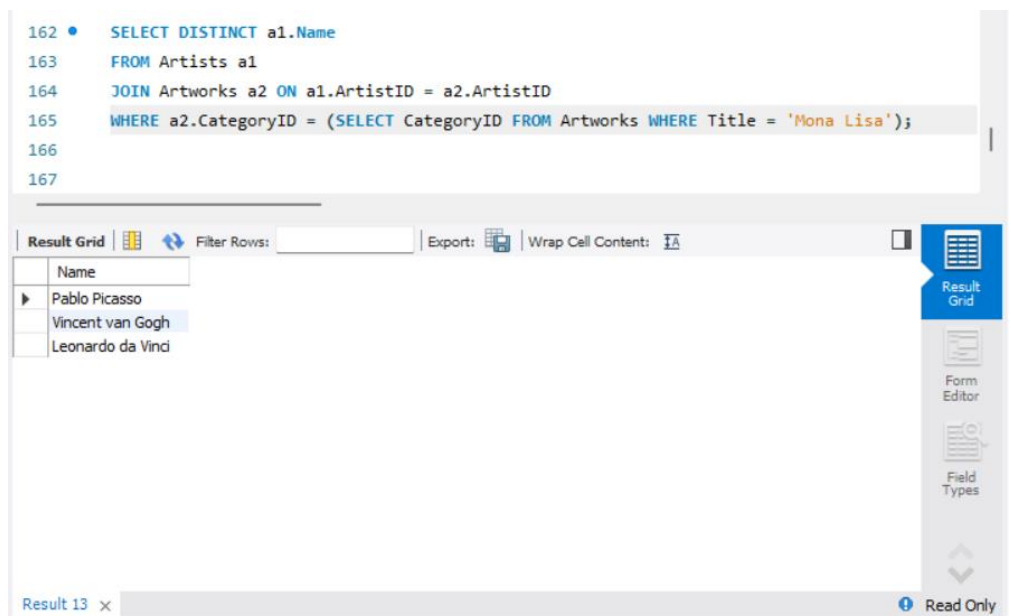Result 10 ×   Read Only

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

```
SELECT DISTINCT a1.Name
FROM Artists a1
JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
WHERE a2.CategoryID = (SELECT CategoryID FROM Artworks WHERE Title = 'Mona
Lisa');
```

```
162 •   SELECT DISTINCT a1.Name
163     FROM Artists a1
164     JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
165     WHERE a2.CategoryID = (SELECT CategoryID FROM Artworks WHERE Title = 'Mona Lisa');
166
167
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: 𝐼𝐴

Name
Pablo Picasso
Vincent van Gogh
Leonardo da Vinci

Result 13 ×   Read Only

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

```
SELECT a1.Name, COUNT(a2.ArtworkID) AS ArtworkCount
FROM Artists a1
LEFT JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
GROUP BY a1.Name
ORDER BY ArtworkCount DESC;
```

```sql
75 •   SELECT a1.Name, COUNT(a2.ArtworkID) AS ArtworkCount
76      FROM Artists a1
77      LEFT JOIN Artworks a2 ON a1.ArtistID = a2.ArtistID
78      GROUP BY a1.Name
79      ORDER BY ArtworkCount DESC;
80
```

Name	ArtworkCount
Pablo Picasso	1
Vincent van Gogh	1
Leonardo da Vinci	1

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Result Grid

Form Editor

Field Types

Result 1 ×

ⓘ Read Only