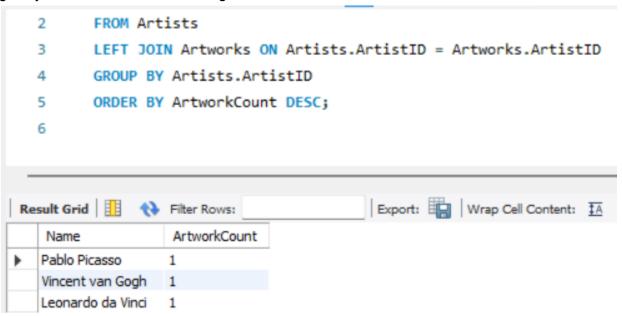# Virtual art gallery

```
1    create database vagdb;
2  • use vagdb;
```

```
1  • ⊖ CREATE TABLE Artists (
2        ArtistID INT PRIMARY KEY,
3        Name VARCHAR(255) NOT NULL,
4        Biography TEXT,
5        Nationality VARCHAR(100)
6      );
7  • ⊖ CREATE TABLE Categories (
8        CategoryID INT PRIMARY KEY,
9        Name VARCHAR(100) NOT NULL
10     );
11 • ⊖ CREATE TABLE Artworks (
12        ArtworkID INT PRIMARY KEY,
13        Title VARCHAR(255) NOT NULL,
14        ArtistID INT,
15        CategoryID INT,
16        Year INT,
17        Description TEXT,
18        ImageURL VARCHAR(255),
19        FOREIGN KEY (ArtistID) REFERENCES Artists (ArtistID),
20        FOREIGN KEY (CategoryID) REFERENCES Categories (CategoryID)
21     );
```
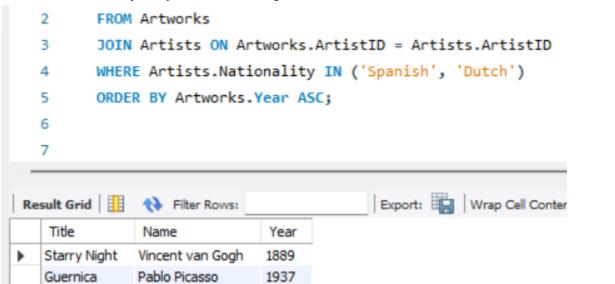
```sql
CREATE TABLE Exhibitions (
    ExhibitionID INT PRIMARY KEY,
    Title VARCHAR(255) NOT NULL,
    StartDate DATE,
    EndDate DATE,
    Description TEXT
);


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

```sql
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);
```

Tasks

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.

```
2        FROM Artists
3        LEFT JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4        GROUP BY Artists.ArtistID
5        ORDER BY ArtworkCount DESC;
6
```

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

| Name | ArtworkCount |
|------|--------------|
| ▶ Pablo Picasso | 1 |
| Vincent van Gogh | 1 |
| Leonardo da Vinci | 1 |

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

```
2        FROM Artworks
3        JOIN Artists ON Artworks.ArtistID = Artists.ArtistID
4        WHERE Artists.Nationality IN ('Spanish', 'Dutch')
5        ORDER BY Artworks.Year ASC;
6
7
```

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

| Title | Name | Year |
|-------|------|------|
| ▶ Starry Night | Vincent van Gogh | 1889 |
| Guernica | Pablo Picasso | 1937 |

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

```
1 ●   SELECT Artists.Name, COUNT(Artworks.ArtworkID) AS ArtworkCount
2     FROM Artists
3     JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4     JOIN Categories ON Artworks.CategoryID = Categories.CategoryID
5     WHERE Categories.Name = 'Painting'
6     GROUP BY Artists.ArtistID
7     ORDER BY ArtworkCount DESC;
8
```

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

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

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

```
1 ●   SELECT Artworks.Title, Artists.Name, Categories.Name AS Category
2     FROM Artworks
3     JOIN ExhibitionArtworks ON Artworks.ArtworkID = ExhibitionArtworks.ArtworkID
4     JOIN Exhibitions ON ExhibitionArtworks.ExhibitionID = Exhibitions.ExhibitionID
5     JOIN Artists ON Artworks.ArtistID = Artists.ArtistID
6     JOIN Categories ON Artworks.CategoryID = Categories.CategoryID
7     WHERE Exhibitions.Title = 'Modern Art Masterpieces';
8     |
```

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

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

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

```
1 ●    SELECT Artists.Name
2      FROM Artists
3      JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4      GROUP BY Artists.ArtistID
5      HAVING COUNT(Artworks.ArtworkID) > 2;
6
```

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

| Name |
| --- |

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

```
1 ●    SELECT Artworks.Title
2      FROM Artworks
3      JOIN ExhibitionArtworks ON Artworks.ArtworkID = ExhibitionArtworks.ArtworkID
4      JOIN Exhibitions ON ExhibitionArtworks.ExhibitionID = Exhibitions.ExhibitionID
5      WHERE Exhibitions.Title = 'Modern Art Masterpieces'
6    ⊖ AND Artworks.ArtworkID IN (
7          SELECT ArtworkID
8          FROM ExhibitionArtworks
```

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

| Title |
| --- |
| Mona Lisa |

7. Find the total number of artworks in each category

```
1 •    SELECT Categories.Name AS Category, COUNT(Artworks.ArtworkID) AS ArtworkCount
2      FROM Categories
3      LEFT JOIN Artworks ON Categories.CategoryID = Artworks.CategoryID
4      GROUP BY Categories.CategoryID;
5
```

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

| Category | ArtworkCount |
| --- | --- |
| ▶ Painting | 3 |
| Sculpture | 0 |
| Photography | 0 |

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

```
1 •    SELECT Artists.Name, COUNT(Artworks.ArtworkID) AS ArtworkCount
2      FROM Artists
3      JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4      GROUP BY Artists.ArtistID
5      HAVING ArtworkCount > 3;
6
7
```

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

| Name | ArtworkCount |
| --- | --- |

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

```
1  ●   SELECT Artworks.Title, Artists.Name, Artists.Nationality
2      FROM Artworks
3      JOIN Artists ON Artworks.ArtistID = Artists.ArtistID
4      WHERE Artists.Nationality = 'Spanish';
5      |
6
```

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

| Title | Name | Nationality |
|-------|------|-------------|
| ▶ Guernica | Pablo Picasso | Spanish |

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

```
1  ●   SELECT Exhibitions.Title
2      FROM Exhibitions
3      JOIN ExhibitionArtworks ON Exhibitions.ExhibitionID = ExhibitionArtworks.ExhibitionID
4      JOIN Artworks ON ExhibitionArtworks.ArtworkID = Artworks.ArtworkID
5      JOIN Artists ON Artworks.ArtistID = Artists.ArtistID
6      WHERE Artists.Name IN ('Vincent van Gogh', 'Leonardo da Vinci')
7      GROUP BY Exhibitions.ExhibitionID
8      HAVING COUNT(DISTINCT Artists.Name) = 2;
```

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

| Title |
|-------|
| ▶ Modern Art Masterpieces |

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

```
1 •   SELECT Artworks.Title
2     FROM Artworks
3     LEFT JOIN ExhibitionArtworks ON Artworks.ArtworkID = ExhibitionArtworks.ArtworkID
4     WHERE ExhibitionArtworks.ArtworkID IS NULL;
5
```

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

| Title |
|-------|

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

```
1 •   SELECT Artists.Name
2     FROM Artists
3     JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4     JOIN Categories ON Artworks.CategoryID = Categories.CategoryID
5     GROUP BY Artists.ArtistID, Artists.Name
6     HAVING COUNT(DISTINCT Categories.CategoryID) = (SELECT COUNT(*) FROM Categories);
7
```

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

| Name |
|------|

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

```
1 •   SELECT Categories.Name AS Category, COUNT(Artworks.ArtworkID) AS ArtworkCount
2     FROM Categories
3     LEFT JOIN Artworks ON Categories.CategoryID = Artworks.CategoryID
4     GROUP BY Categories.CategoryID;
5
```

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

| Category | ArtworkCount |
|----------|--------------|
| Painting | 3 |
| Sculpture | 0 |
| Photography | 0 |

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

```
1 ●    SELECT Artists.Name
2      FROM Artists
3      JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4      GROUP BY Artists.ArtistID
5      HAVING COUNT(Artworks.ArtworkID) > 2;
6
```
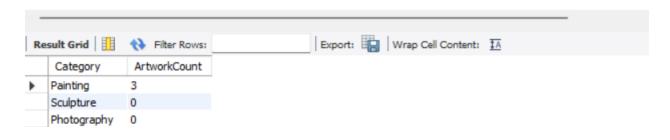
| Result Grid | Filter Rows: | Export: | Wrap Cell Conter |

| Name |
| --- |

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

```
1 ●    SELECT Categories.Name AS Category, AVG(Artworks.Year) AS AvgYear
2      FROM Categories
3      JOIN Artworks ON Categories.CategoryID = Artworks.CategoryID
4      GROUP BY Categories.CategoryID
5      HAVING COUNT(Artworks.ArtworkID) > 1;
6
```

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

| Category | AvgYear |
| --- | --- |
| Painting | 1776.3333 |

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

```
1 •   SELECT Artworks.Title
2     FROM Artworks
3     JOIN ExhibitionArtworks ON Artworks.ArtworkID = ExhibitionArtworks.ArtworkID
4     JOIN Exhibitions ON ExhibitionArtworks.ExhibitionID = Exhibitions.ExhibitionID
5     WHERE Exhibitions.Title = 'Modern Art Masterpieces';
6
```

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

| Title |
| --- |
| ▶ Starry Night |
| Mona Lisa |
| Guernica |

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

```
1 •   SELECT Categories.Name AS Category, AVG(Artworks.Year) AS AvgYear
2     FROM Categories
3     JOIN Artworks ON Categories.CategoryID = Artworks.CategoryID
4     GROUP BY Categories.CategoryID
5     HAVING AVG(Artworks.Year) > (SELECT AVG(Year) FROM Artworks);
6
```
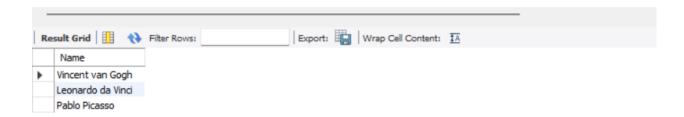
Result Grid | Filter Rows: | Export: | Wrap Cell Content: IA

| Category | AvgYear |
| --- | --- |

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

```
1 •   SELECT Artworks.Title
2     FROM Artworks
3     LEFT JOIN ExhibitionArtworks ON Artworks.ArtworkID = ExhibitionArtworks.ArtworkID
4     WHERE ExhibitionArtworks.ArtworkID IS NULL;
5
```

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

| Title |
| --- |

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

```sql
1 ● SELECT DISTINCT Artists.Name
2   FROM Artists
3   JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4   WHERE Artworks.CategoryID IN (SELECT CategoryID FROM Artworks WHERE Title = 'Mona Lisa');
5   |
```

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

| Name |
| --- |
| ▶ Vincent van Gogh |
| Leonardo da Vinci |
| Pablo Picasso |

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

```sql
1 ● SELECT Artists.Name, COUNT(Artworks.ArtworkID) AS ArtworkCount
2   FROM Artists
3   JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID
4   GROUP BY Artists.ArtistID;
5
```

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

| Name | ArtworkCount |
| --- | --- |
| ▶ Pablo Picasso | 1 |
| Vincent van Gogh | 1 |
| Leonardo da Vinci | 1 |