**NAME: J209 Kishanth K**

**Coding Challenge SQL**

**Virtual Art Gallery Shema DDL and DML**

-- Create the Artists table

CREATE TABLE Artists (

ArtistID INT PRIMARY KEY,

Name VARCHAR(255) NOT NULL,

Biography TEXT,

Nationality VARCHAR(100));

-- Create the Categories table

CREATE TABLE Categories (

CategoryID INT PRIMARY KEY,

Name VARCHAR(100) NOT NULL);

-- Create the 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));

-- Create the Exhibitions table

CREATE TABLE Exhibitions (

ExhibitionID INT PRIMARY KEY,

Title VARCHAR(255) NOT NULL,

StartDate DATE,

EndDate DATE,

Description TEXT);

-- 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)); **DML(Insert sample data to tables)**

-- Insert 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');

-- Insert sample data into the Categories table

INSERT INTO Categories (CategoryID, Name) VALUES

(1, 'Painting'),

(2, 'Sculpture'),

(3, 'Photography');

-- Insert 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');

-- Insert 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.');

-- Insert artworks into exhibitions

INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES

(1, 1),

(1, 2),

(1, 3),

(2, 2);

**Solve the below queries**:

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. List the titles of artworks created by artists from 'Spanish' and 'Dutch' nationalities, and order them by the year in ascending order.
3. Find the names of all artists who have artworks in the 'Painting' category, and the number of artworks they have in this category.
4. List the names of artworks from the 'Modern Art Masterpieces' exhibition, along with their artists and categories.
5. Find the artists who have more than two artworks in the gallery.
6. Find the titles of artworks that were exhibited in both 'Modern Art Masterpieces' and 'Renaissance Art' exhibitions
7. Find the total number of artworks in each category
8. List artists who have more than 3 artworks in the gallery.
9. Find the artworks created by artists from a specific nationality (e.g., Spanish).
10. List exhibitions that feature artwork by both Vincent van Gogh and Leonardo da Vinci.
11. Find all the artworks that have not been included in any exhibition.
12. List artists who have created artworks in all available categories.
13. List the total number of artworks in each category.
14. Find the artists who have more than 2 artworks in the gallery.
15. List the categories with the average year of artworks they contain, only for categories with more than 1 artwork.
16. Find the artworks that were exhibited in the 'Modern Art Masterpieces' exhibition.
17. Find the categories where the average year of artworks is greater than the average year of all artworks.
18. List the artworks that were not exhibited in any exhibition.
19. Show artists who have artworks in the same category as "Mona Lisa."
20. List the names of artists and the number of artworks they have in the gallery.

**Answers:**# ---------------------------------------------------------------------------------------------------------------------------------------------------------------------

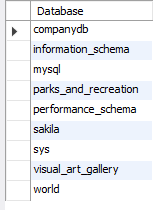
-- Check if the database exists and drop it if it does

DROP DATABASE IF EXISTS visual\_art\_gallery;

-- Create the database

CREATE DATABASE visual\_art\_gallery;

-- Check whether the database is created

SHOW DATABASES;  
  


-- Once the database is created, use the database

USE visual\_art\_gallery;

# ---------------------------------------------------------------------------------------------------------------------------------------------------------------------

-- Create the Artists table

CREATE TABLE Artists (

ArtistID INT PRIMARY KEY,

Name VARCHAR(255) NOT NULL,

Biography TEXT,

Nationality VARCHAR(100));

-- Create the Categories table

CREATE TABLE Categories (

CategoryID INT PRIMARY KEY,

Name VARCHAR(100) NOT NULL);

-- Create the 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));

-- Create the Exhibitions table

CREATE TABLE Exhibitions (

ExhibitionID INT PRIMARY KEY,

Title VARCHAR(255) NOT NULL,

StartDate DATE,

EndDate DATE,

Description TEXT);

-- 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));

-- Insert 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');

-- Insert sample data into the Categories table

INSERT INTO Categories (CategoryID, Name) VALUES

(1, 'Painting'),

(2, 'Sculpture'),

(3, 'Photography');

-- Insert 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');

-- Insert 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.');

-- Insert artworks into exhibitions

INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES

(1, 1),

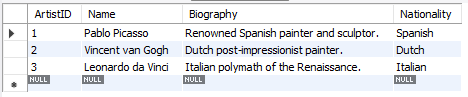
(1, 2),

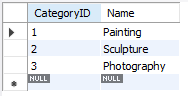
(1, 3),

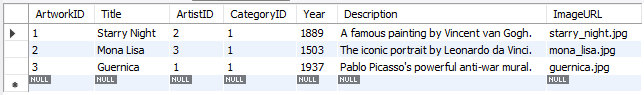
(2, 2);

# ---------------------------------------------------------------------------------------------------------------------------------------------------------------------

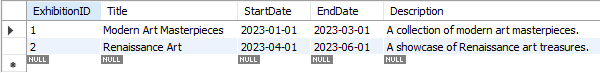
-- Displaying the tables

SELECT \* FROM Artists;  
  


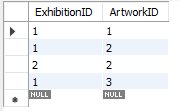
SELECT \* FROM Categories;  
  


SELECT \* FROM Artworks;  
  


SELECT \* FROM Exhibitions;



SELECT \* FROM ExhibitionArtworks;



# ---------------------------------------------------------------------------------------------------------------------------------------------------------------------

-- 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

a.Name,

COUNT(aw.ArtworkID) AS NumOfArtworks

FROM

Artists a

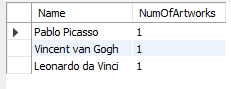
LEFT JOIN Artworks aw ON a.ArtistID = aw.ArtistID

GROUP BY

a.ArtistID, a.Name

ORDER BY

NumOfArtworks DESC;



* *This query retrieves the names of all artists along with the number of artworks they have in the gallery, sorted in descending order by the number of artworks.*

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

SELECT

aw.Title,

a.Name,

a.Nationality,

aw.Year

FROM

Artworks aw

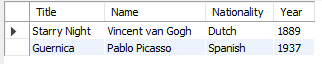
INNER JOIN Artists a ON aw.ArtistID = a.ArtistID

WHERE

a.Nationality IN ('Spanish', 'Dutch')

ORDER BY

aw.Year ASC;



* *This query lists the titles and years of artworks created by artists from Spanish and Dutch nationalities, ordered by the year in ascending order.*

-- 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(aw.ArtworkID) AS NumOfPaintings

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

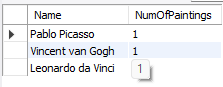
INNER JOIN Categories c ON aw.CategoryID = c.CategoryID

WHERE

c.Name = 'Painting'

GROUP BY

a.ArtistID, a.Name;



* *This query finds the names of artists who have artworks in the 'Painting' category and counts how many artworks each has in that category.*

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

SELECT

aw.Title AS ArtworkTitle,

a.Name AS Artist,

c.Name AS Category

FROM

Artworks aw

INNER JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID

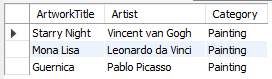
INNER JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID

INNER JOIN Artists a ON aw.ArtistID = a.ArtistID

INNER JOIN Categories c ON aw.CategoryID = c.CategoryID

WHERE

e.Title = 'Modern Art Masterpieces';



* *This query lists the titles of artworks, along with their artists and categories, that are part of the 'Modern Art Masterpieces' exhibition.*

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

SELECT

a.Name,

COUNT(aw.ArtworkID) AS NumOfArtworks

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

GROUP BY

a.ArtistID, a.Name

HAVING

COUNT(aw.ArtworkID) > 2;

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query identifies artists who have more than two artworks in the gallery.*

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

SELECT

aw.Title as ArtworkTitle

FROM

Artworks aw

INNER JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID

INNER JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID

WHERE

e.Title IN ('Modern Art Masterpieces', 'Renaissance Art')

GROUP BY

aw.ArtworkID, aw.Title

HAVING

COUNT(DISTINCT e.Title) = 2;



* *This query finds the titles of artworks that were exhibited in both the 'Modern Art Masterpieces' and 'Renaissance Art' exhibitions.*

-- 7. Find the total number of artworks in each category.

SELECT

c.Name AS Category,

COUNT(aw.ArtworkID) AS NumOfArtworks

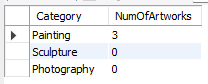
FROM

Categories c

LEFT JOIN Artworks aw ON c.CategoryID = aw.CategoryID

GROUP BY

c.CategoryID, c.Name;



* *This query calculates the total number of artworks in each category.*

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

SELECT

a.Name,

COUNT(aw.ArtworkID) AS NumOfArtworks

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

GROUP BY

a.ArtistID, a.Name

HAVING

COUNT(aw.ArtworkID) > 3;

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query lists artists who have more than three artworks in the gallery.*

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

SELECT

aw.ArtworkID,

aw.Title,

aw.ArtistID,

a.Name,

a.Nationality,

aw.Year,

aw.Description

FROM

Artworks aw

INNER JOIN Artists a ON aw.ArtistID = a.ArtistID

WHERE

a.Nationality = 'Spanish';



* *This query finds all artworks created by artists of a specified nationality, such as Spanish.*

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

SELECT

e.ExhibitionID,

e.Title

FROM

Exhibitions e

INNER JOIN ExhibitionArtworks ea ON e.ExhibitionID = ea.ExhibitionID

INNER JOIN Artworks aw ON ea.ArtworkID = aw.ArtworkID

INNER JOIN Artists a ON aw.ArtistID = a.ArtistID

WHERE

a.Name IN ('Vincent van Gogh', 'Leonardo da Vinci')

GROUP BY

e.ExhibitionID, e.Title

HAVING

COUNT(DISTINCT a.Name) = 2;



* *This query lists exhibitions that feature artworks by both Vincent van Gogh and Leonardo da Vinci.*

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

SELECT

aw.\*

FROM

Artworks aw

LEFT JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID

WHERE

ea.ExhibitionID IS NULL;

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query finds artworks that have not been included in any exhibition.*

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

SELECT

a.Name

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

GROUP BY

a.ArtistID, a.Name

HAVING

COUNT(DISTINCT aw.CategoryID) = (SELECT COUNT(\*) FROM Categories);

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query lists artists who have created artworks in every available category.*

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

SELECT

c.Name AS Category,

COUNT(aw.ArtworkID) AS NumOfArtworks

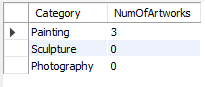
FROM

Categories c

LEFT JOIN Artworks aw ON c.CategoryID = aw.CategoryID

GROUP BY

c.CategoryID, c.Name;



* *This query lists the total number of artworks in each category.*

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

SELECT

a.Name,

COUNT(aw.ArtworkID) AS NumOfArtworks

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

GROUP BY

a.ArtistID, a.Name

HAVING

COUNT(aw.ArtworkID) > 2;

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query finds artists with more than two artworks in the gallery.*

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

SELECT

c.Name AS Category,

AVG(aw.Year) AS AvgYear

FROM

Categories c

INNER JOIN Artworks aw ON c.CategoryID = aw.CategoryID

GROUP BY

c.CategoryID, c.Name

HAVING

COUNT(aw.ArtworkID) > 1;  
  


* *This query lists categories with the average year of artworks they contain, but only for categories with more than one artwork.*

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

SELECT

aw.\*

FROM

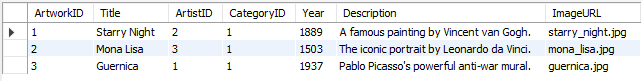
Artworks aw

INNER JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID

INNER JOIN Exhibitions e ON ea.ExhibitionID = e.ExhibitionID

WHERE

e.Title = 'Modern Art Masterpieces';



* *This query finds all artworks that were exhibited in the 'Modern Art Masterpieces' exhibition.*

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

SELECT

c.Name AS Category,

AVG(aw.Year) AS AvgCategoryYear

FROM

Categories c

INNER JOIN Artworks aw ON c.CategoryID = aw.CategoryID

GROUP BY

c.CategoryID, c.Name

HAVING

AVG(aw.Year) > (SELECT AVG(Year) FROM Artworks);

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query identifies categories where the average year of artworks is greater than the average year of all artworks.*

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

SELECT

aw.\*

FROM

Artworks aw

LEFT JOIN ExhibitionArtworks ea ON aw.ArtworkID = ea.ArtworkID

WHERE

ea.ExhibitionID IS NULL;

# Result : NULL (or) Empty Set (or) 0 rows(s) returned



* *This query lists artworks not included in any exhibition.*

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

SELECT DISTINCT

a.\*

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

WHERE # correlated subquery

aw.CategoryID = (

SELECT

CategoryID

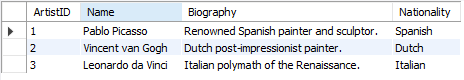
FROM

Artworks

WHERE

Title = 'Mona Lisa'

);



* *This query shows artists who have artworks in the same category as "Mona Lisa."*

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

SELECT

a.Name,

COUNT(aw.ArtworkID) AS NumArtworks

FROM

Artists a

INNER JOIN Artworks aw ON a.ArtistID = aw.ArtistID

GROUP BY

a.ArtistID, a.Name;



* *This query lists the names of artists and the number of artworks they have in the gallery.*

# ---------------------------------------------------------------------------------------------------------------------------------------------------------------------