SVKM's NMIMS

School of Technology Management & Engineering, Navi Mumbai

A.Y. 2023 - 24

Course: Database Management Systems

Project Report

Program	B.Tech. Computer Engineering	
Semester	IV	
Name of the Project:	Art Gallery Management System	
Details of Project Members		
Batch	Roll No.	Name
B1	A078	Archit Mahajan
B1	A079	Sneha Shah
Date of Submission: 02/04/2024		

Contribution of each project Member:

Roll No.	Name:	Contribution
A078	Archit Mahajan	
A079	Sneha Shah	

Github link of your project:

https://github.com/Archit-Mahajan/Art-Gallery-Management-System

Note:

1. Create a readme file if you have multiple files
2. All files must be properly named (Example: R004_DBMSProject)
3. Submit all relevant files of your work (Report, all SQL files, Any other files)
4. **Plagiarism is highly discouraged (Your report will be checked for plagiarism)**

Rubrics for the Project evaluation:

First phase of evaluation: Innovative Ideas (5 Marks) Design and Partial implementation (5 Marks)	10 marks
Final phase of evaluation Implementation, presentation and viva, Self-Learning and Learning Beyond Classroom	10 marks

Project Report

ART GALLERY MANAGEMENT SYSTEM

by

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Course: DBMS

AY: 2023-24

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I. Storyline

An art gallery is an exhibition space to display and sell artworks. As a result, the art gallery is a commercial enterprise working with a portfolio of artists. The gallery acts as the dealer representing, supporting, and distributing the artworks by the artists in question.

Art Gallery Management System is essentially an application that allows galleries to maintain a record of their day-to-day proceedings. This involves storing information about the artworks in their custody, artists under their label, collections showcased in the gallery, the sellers, buyers, visitors, patrons associated with their gallery, curators and general staff working for the gallery, exhibitions hosted, collaborative projects, affiliated institutes, branches, as well as details required by the PR&M department.

A database management system can help gallery owners with asset management in the following ways:

Cataloging Artworks: In an art gallery, managing inventory is crucial. A DBMS allows for efficient cataloging of artworks, storing details like artist name, title, medium, dimensions, creation date, provenance, and more. This structured data enables easy retrieval and organization, facilitating tasks such as exhibition planning and valuation.

Managing Artists and Clients: A gallery often represents multiple artists and interacts with various clients. A DBMS can maintain comprehensive profiles for artists and clients. This centralized data management ensures effective communication and relationship management.

Inventory Management: Artworks move frequently within a gallery, between exhibitions, storage, and sales. A DBMS tracks all artworks currently stored or exhibited in the gallery, or sold from or recently purchased by the gallery.

Exhibition Planning and Management: Galleries often host temporary exhibitions featuring selected artworks. A DBMS aids in curating exhibitions by providing insights into available inventory, artist availability, thematic coherence, and logistical requirements. It also supports the creation of exhibition catalogs and promotional materials.

Digital Asset Management: In today's digital age, galleries maintain extensive collections of digital images for marketing, archival, and online sales purposes. A DBMS can organize and store these digital assets, associating them with corresponding artworks and facilitating easy retrieval of data.

By integrating a DBMS into an art gallery management system, galleries can enhance operational efficiency, improve customer service, and optimize business performance in a

dynamic and competitive art market.

II. Components of Database Design

Entities with Primary Keys (PK) and Foreign Keys (FK)

Gallery
- gallery_id (PK)
- name
- address

Artworks
- art_id (PK)
- title
- artist_name
- year
- description
- FK: artist_id (from Artists)
- FK: gallery_id (from Gallery)

Artists
- artist_id (PK)
- artist_name
- description
- birthdate

Collections
- collection_id (PK)
- collection_name
- collection_theme

Sellers
- purchases
- FK: art_id (from Artworks)

Buyers
- sold
- FK: art_id (from Artworks)

Patrons
- artist_name
- amount

Staff

- emp_id (PK)
- name
- department
- salary
- FK: gallery_id (from Gallery)

Exhibitions
- exhibition_id (PK)
- date
- exhibition_name
- exhibition_theme
- location
- FK: gallery_id (from Gallery)

Collaborations
- gallery_name
- project
- FK: gallery_id (from Gallery)

Visitors
- date
- name
- FK: gallery_id (from Gallery)

Branches
- city
- country
- FK: gallery_id (from Gallery)

Affiliations
- college_id (PK)
- college_name
- point_of_contact
- FK: gallery_id (from Gallery)

Curators
- id (PK)
- name
- specialization

- FK: art_id (from Artworks)

PR&M (Public Relations & Marketing)
- social_media_hashtags
- sponsorship_details
- FK: gallery_id (from Gallery)

Projects
- project_id (PK)
- project_name
- description
- emp_name
- department
- due_date
- status
- FK: emp_id (from Staff)

Relationships

Buyers buy Artworks

- 1 to many
- Buyers table will have art_id as a foreign key referencing Artworks table.

Sellers sell Artworks

- 1 to many
- Sellers table will have art_id as a foreign key referencing Artworks table.

Artworks form Collections

- Many to 1
- Artworks table will have collection_id as a foreign key referencing Collections table.

Gallery exhibits Artworks

- 1 to many
- Artworks table will have gallery_id as a foreign key referencing Gallery table.

Curators curate Artworks

- Many to many
- Curators table will have art_id as a foreign key referencing Artworks table.

Artists create Artworks

- 1 to many
- Artworks table will have artist_id as a foreign key referencing Artists table.

Affiliations affiliated with Gallery

- Many to 1
- Affiliations table will have gallery_id as a foreign key referencing Gallery table.

PR&M advertise Gallery

- 1 to many
- PR&M table will have gallery_id as a foreign key referencing Gallery table.

Gallery has Branches

- 1 to many
- Branches table will have gallery_id as a foreign key referencing Gallery table.

Collaborations collaborate with Gallery

- Many to 1
- Collaborations table will have gallery_id as a foreign key referencing Gallery table.

Staff works Gallery

- Many to many
- Staff table will have gallery_id as a foreign key referencing Gallery table.

Gallery hosts Exhibitions

- 1 to many
- Exhibitions table will have gallery_id as a foreign key referencing Gallery table.
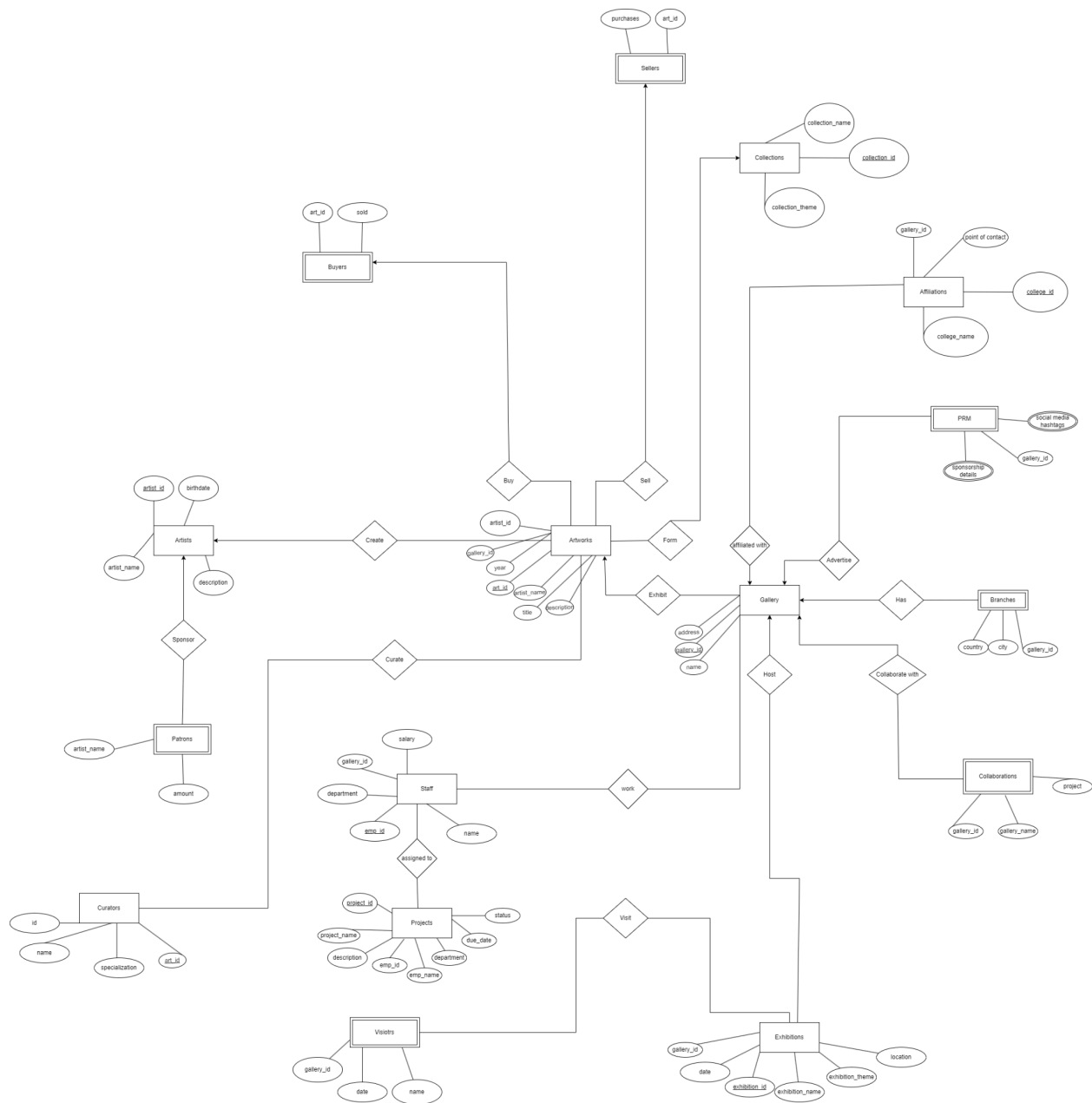
Visitors visit Exhibitions

- Many to many

Patrons sponsor Artists

- Many to 1

Projects assigned to Staff

- Many to many
- Projects table will have emp_id as a foreign key referencing Staff table.

III. Entity Relationship Diagram

IV. Relational Model

Gallery

PK	gallery_id
	name
	address

Artworks

PK	art_id
	title
	artist_id (FK)
	artist_name
	year
	description
	gallery_id (FK)

Artists

PK	artist_id
	artist_name
	description
	birth date

Collections

PK	collection_id
	collection_name
	collection_theme

Sellers

PK	
	purchases
	art_id (FK)

Buyers

PK	
	sold
	art_id (FK)

Patrons

PK	
	amount
	artist_name

Staff

PK	emp_id
	name
	department
	salary
	gallery_id (FK)

Exhibitions

PK	exhibition_id
	date
	exhibiton_name
	exhibition_theme
	location
	gallery_id (FK)

Collaborations

PK	
	gallery_id
	gallery_name
	project

Visitors

PK	
	date
	name
	gallery_id (FK)

Branches

PK	
	city
	country
	gallery_id (FK)

Affiliations

PK	college_id
	college_name
	point of contact
	gallery_id (FK)

Curators

PK	id
	name
	specialization
	art_id (FK)

PR&M

PK	
	social media hashtags
	sponsorship details
	gallery_id (FK)

Projects

PK	project_id
	project_name
	description
	emp_id (FK)
	emp_name
	department
	due_date
	status

V. Normalization

	1NF	2NF	3NF	BCNF
Gallery	✓	✓	✓	✓
Artists	✓	✓	✓	✓
Artworks	✓	✓	✓	✓
Collections	✓	✓	✓	✓
Sellers	✓	✓	✓	✓
Buyers	✓	✓	✓	✓
Patrons	✓	✓	✓	✓
Staff	✓	✓	✓	✓
Exhibitions	✓	✓	✓	✓
Collaborations	✓	✓	✓	✓
Visitors	✓	✓	✓	✓
Branches	✓	✓	✓	✓
Affiliations	✓	✓	✓	✓
Curators	✓	✓	✓	✓
PRM	✓	✓	✓	✓
Projects	✓	✗	✗	✗

1NF: The tables have a primary key and all columns contain atomic values, so they satisfy 1NF.

2NF: All non-key attributes are fully functionally dependent on the entire primary key, so tables satisfy 2NF.

3NF: There are no transitive dependencies, so tables satisfy 3NF.

BCNF: The tables do not have overlapping candidate keys, so they satisfy BCNF.

However, the Projects table is not in 2NF because it has partial dependencies. The attributes emp_name and department are functionally dependent on emp_id and not project_id.

To resolve this, we split the entity into Project_Assigned, Project_Details, and Employee_Details.

Original Entity: Projects

Attributes:

- project_id (Primary Key)
- project_name
- project_description
- emp_id (Foreign Key referencing Staff table)
- emp_name (Derived attribute from Staff table)
- department (Derived attribute from Staff table)
- project_due_date
- project_status

New Entity: Project_Assigned

Attributes:

- project_id (Primary Key, Foreign Key referencing EmployeeProjects table)
- emp_id (Primary Key, Foreign Key referencing Staff table)

New Entity: Project_Details

Attributes:

- project_id (Primary Key, Foreign Key referencing Projects_Assigned table)
- project_name
- project_description
- project_due_date
- project_status

New Entity: Employee_Details

Attributes:

- emp_id (Primary Key, Foreign Key referencing Staff table)
- emp_name
- department

The entities are now in the second normal form (2NF), as there are no partial dependencies. Each non-prime attribute is fully functionally dependent on the candidate key.

Further normalization to third normal form (3NF) is not needed as there are no transitive dependencies in the entities. Each non-prime attribute is directly dependent on the candidate key.

Since each relation doesn't contain any non-trivial functional dependencies where the determinant is a proper subset of a candidate key, all the relations are in Boyce-Codd Normal Form (BCNF).

VI. SQL Queries

- Creating the tables

```sql
CREATE TABLE Gallery(

        gallery_id INT PRIMARY KEY,

    name VARCHAR(50),

    address VARCHAR(100));


CREATE TABLE Artists(

        artist_id INT PRIMARY KEY,

    artist_name VARCHAR(50),

    description VARCHAR(100),

    birthdate DATE);


CREATE TABLE Artworks(

        art_id INT PRIMARY KEY,

    title VARCHAR(50),

    artist_name VARCHAR(100),

    artist_id INT,

    year INT,

    description VARCHAR(100),

    gallery_id INT,

    FOREIGN KEY(artist_id) REFERENCES Artists(artist_id),

    FOREIGN KEY(gallery_id) REFERENCES Gallery(gallery_id));
```

```sql
CREATE TABLE Collections (

    collection_id INT PRIMARY KEY,

    collection_name VARCHAR(255),

    collection_theme VARCHAR(255)

);


CREATE TABLE Sellers (

    purchases VARCHAR(255),

    art_id INT,

    FOREIGN KEY (art_id) REFERENCES Artworks(art_id)

);


CREATE TABLE Buyers (

    sold VARCHAR(255),

    art_id INT,

    FOREIGN KEY (art_id) REFERENCES Artworks(art_id)

);


CREATE TABLE Patrons (

    artist_name VARCHAR(255),

    amount DECIMAL(10, 2)

);
```

```sql
CREATE TABLE Staff (

    emp_id INT PRIMARY KEY,

    name VARCHAR(255),

    department VARCHAR(255),

    salary DECIMAL(10, 2),

    gallery_id INT,

    FOREIGN KEY (gallery_id) REFERENCES Gallery(gallery_id)

);


CREATE TABLE Exhibitions (

    exhibition_id INT PRIMARY KEY,

    date DATE,

    exhibition_name VARCHAR(255),

    exhibition_theme VARCHAR(255),

    location VARCHAR(255),

    gallery_id INT,

    FOREIGN KEY (gallery_id) REFERENCES Gallery(gallery_id)

);


CREATE TABLE Collaborations (

    gallery_id INT,

    gallery_name VARCHAR(255),

    project VARCHAR(255),

    FOREIGN KEY (gallery_id) REFERENCES Gallery(gallery_id)
```

```
);


CREATE TABLE Visitors (

    date DATE,

    name VARCHAR(255),

    gallery_id INT

);


CREATE TABLE Branches (

    city VARCHAR(255),

    country VARCHAR(255),

    gallery_id INT,

    FOREIGN KEY (gallery_id) REFERENCES Gallery(gallery_id)

);


CREATE TABLE Affiliations (

    college_id INT PRIMARY KEY,

    college_name VARCHAR(255),

    point_of_contact VARCHAR(255),

    gallery_id INT,

    FOREIGN KEY (gallery_id) REFERENCES Gallery(gallery_id)

);


CREATE TABLE Curators (
```

```sql
    id INT PRIMARY KEY,

    name VARCHAR(255),

    specialization VARCHAR(255),

    art_id INT,

    FOREIGN KEY (art_id) REFERENCES Artworks(art_id)
);


CREATE TABLE PRM (

    social_media_hashtags VARCHAR(255),

    sponsorship_details TEXT,

    gallery_id INT,

    FOREIGN KEY (gallery_id) REFERENCES Gallery(gallery_id)
);


CREATE TABLE Project_Assigned (

    project_id INT,

    emp_id INT,

    PRIMARY KEY (project_id, emp_id),

    FOREIGN KEY (project_id) REFERENCES Project_Details(project_id),

    FOREIGN KEY (emp_id) REFERENCES Employee_Details(emp_id)
);


CREATE TABLE Project_Details (

    project_id INT PRIMARY KEY,
```

```sql
    project_name VARCHAR(100),

    project_description VARCHAR(255),

    project_due_date DATE,

    project_status VARCHAR(50)

);


CREATE TABLE Employee_Details (

    emp_id INT PRIMARY KEY,

    emp_name VARCHAR(100),

    department VARCHAR(100)

);
```

- Populating the tables

```sql
INSERT INTO Gallery (gallery_id, name, address) VALUES

(1, 'Art Gallery One', '123 Main St, City A'),

(2, 'Modern Art Museum', '456 Elm St, City B'),

(3, 'Contemporary Art Center', '789 Oak St, City C'),

(4, 'City Art Space', '101 Pine St, City D'),

(5, 'Metropolitan Gallery', '202 Maple St, City E'),

(6, 'Urban Art Hub', '303 Cedar St, City F'),

(7, 'Creative Art Studio', '404 Walnut St, City G'),

(8, 'Gallery X', '505 Spruce St, City H'),

(9, 'Artistic Vision Gallery', '606 Birch St, City I'),
```

(10, 'Expressive Arts Center', '707 Cherry St, City J');

gallery_id	name	address
1	Art Gallery One	123 Main St, City A
2	Modern Art Museum	456 Elm St, City B
3	Contemporary Art Center	789 Oak St, City C
4	City Art Space	101 Pine St, City D
5	Metropolitan Gallery	202 Maple St, City E
6	Urban Art Hub	303 Cedar St, City F
7	Creative Art Studio	404 Walnut St, City G
8	Gallery X	505 Spruce St, City H
9	Artistic Vision Gallery	606 Birch St, City I
10	Expressive Arts Center	707 Cherry St, City J
NULL	NULL	NULL

INSERT INTO Artists (artist_id, artist_name, description, birthdate) VALUES

(1, 'John Doe', 'Abstract painter', '1990-05-15'),

(2, 'Jane Smith', 'Sculptor specializing in bronze', '1985-08-20'),

(3, 'Michael Johnson', 'Photorealistic portrait artist', '1978-03-10'),

(4, 'Emily Brown', 'Mixed media artist', '1995-11-25'),

(5, 'David Lee', 'Installation artist', '1982-07-08'),

(6, 'Sarah Taylor', 'Contemporary painter', '1989-09-30'),

(7, 'Robert Wilson', 'Digital artist', '1992-12-18'),

(8, 'Emma Garcia', 'Ceramics artist', '1980-04-05'),

(9, 'Daniel Clark', 'Street artist', '1987-06-22'),

(10, 'Olivia Martinez', 'Land art creator', '1993-02-14');

	artist_id	artist_name	description	birthdate
▶	1	John Doe	Abstract painter	1990-05-15
	2	Jane Smith	Sculptor specializing in bronze	1985-08-20
	3	Michael Johnson	Photorealistic portrait artist	1978-03-10
	4	Emily Brown	Mixed media artist	1995-11-25
	5	David Lee	Installation artist	1982-07-08
	6	Sarah Taylor	Contemporary painter	1989-09-30
	7	Robert Wilson	Digital artist	1992-12-18
	8	Emma Garcia	Ceramics artist	1980-04-05
	9	Daniel Clark	Street artist	1987-06-22
	10	Olivia Martinez	Land art creator	1993-02-14
*	NULL	NULL	NULL	NULL

INSERT INTO Artworks (art_id, title, artist_name, artist_id, year, description, gallery_id)
VALUES

(1, 'Untitled', 'John Doe', 1, 2020, 'Abstract painting on canvas', 1),

(2, 'Sculpture I', 'Jane Smith', 2, 2018, 'Bronze sculpture of a woman', 2),

(3, 'Portrait of a Lady', 'Michael Johnson', 3, 2019, 'Photorealistic portrait in oil', 3),

(4, 'Mixed Media II', 'Emily Brown', 4, 2021, 'Mixed media collage', 4),

(5, 'Installation III', 'David Lee', 5, 2017, 'Interactive installation using mirrors', 5),

(6, 'Abstract Landscape', 'Sarah Taylor', 6, 2016, 'Contemporary landscape painting', 6),

(7, 'Digital Artwork I', 'Robert Wilson', 7, 2022, 'Digital artwork exploring AI', 7),

(8, 'Ceramic Vase', 'Emma Garcia', 8, 2015, 'Handcrafted ceramic vase', 8),

(9, 'Street Mural', 'Daniel Clark', 9, 2014, 'Graffiti mural depicting city life', 9),

(10, 'Land Art Installation', 'Olivia Martinez', 10, 2013, 'Outdoor land art installation', 10);

art_id	title	artist_name	artist_id	year	description	gallery_id
1	Untitled	John Doe	1	2020	Abstract painting on canvas	1
2	Sculpture I	Jane Smith	2	2018	Bronze sculpture of a woman	2
3	Portrait of a Lady	Michael Johnson	3	2019	Photorealistic portrait in oil	3
4	Mixed Media II	Emily Brown	4	2021	Mixed media collage	4
5	Installation III	David Lee	5	2017	Interactive installation using mirrors	5
6	Abstract Landscape	Sarah Taylor	6	2016	Contemporary landscape painting	6
7	Digital Artwork I	Robert Wilson	7	2022	Digital artwork exploring AI	7
8	Ceramic Vase	Emma Garcia	8	2015	Handcrafted ceramic vase	8
9	Street Mural	Daniel Clark	9	2014	Graffiti mural depicting city life	9
10	Land Art Installation	Olivia Martinez	10	2013	Outdoor land art installation	10
NULL	NULL	NULL	NULL	NULL	NULL	NULL

INSERT INTO Collections (collection_id, collection_name, collection_theme) VALUES

(1, 'Abstract Expressions', 'Exploring the realm of abstract art'),

(2, 'Sculptures of Nature', 'Nature-inspired sculptures in various mediums'),

(3, 'Portraits of Identity', 'Exploring individual identity through portraiture'),

(4, 'Mixed Media Marvels', 'Innovative mixed media artworks'),

(5, 'Immersive Installations', 'Interactive and immersive art experiences'),

(6, 'Contemporary Landscapes', 'Interpretations of landscapes in contemporary art'),

(7, 'Digital Horizons', 'Pushing the boundaries of digital art'),

(8, 'Ceramics Collection', 'Celebrating the artistry of ceramics'),

(9, 'Urban Expressions', 'Exploring urban culture through street art'),

(10, 'Earth Art', 'Artworks inspired by and created within nature');

collection_id	collection_name	collection_theme
1	Abstract Expressions	Exploring the realm of abstract art
2	Sculptures of Nature	Nature-inspired sculptures in various mediums
3	Portraits of Identity	Exploring individual identity through portraiture
4	Mixed Media Marvels	Innovative mixed media artworks
5	Immersive Installations	Interactive and immersive art experiences
6	Contemporary Landscapes	Interpretations of landscapes in contemporary art
7	Digital Horizons	Pushing the boundaries of digital art
8	Ceramics Collection	Celebrating the artistry of ceramics
9	Urban Expressions	Exploring urban culture through street art
10	Earth Art	Artworks inspired by and created within nature
NULL	NULL	NULL

INSERT INTO Sellers (purchases, art_id) VALUES

('Private Collector', 1),

('Art Enthusiast', 3),

('Museum', 5),

('Corporate Collection', 7),

('Art Collector', 9),

('Gallery', 2),

('Private Collector', 4),

('Art Enthusiast', 6),

('Museum', 8),

('Corporate Collection', 10);

purchases	art_id
Private Collector	1
Art Enthusiast	3
Museum	5
Corporate Collection	7
Art Collector	9
Gallery	2
Private Collector	4
Art Enthusiast	6
Museum	8
Corporate Collection	10

INSERT INTO Buyers (sold, art_id) VALUES

('Private Collector', 1),

('Art Enthusiast', 3),

('Museum', 5),

('Corporate Collection', 7),

('Art Collector', 9),

('Gallery', 2),

('Private Collector', 4),

('Art Enthusiast', 6),

('Museum', 8),

('Corporate Collection', 10);

	sold	art_id
▶	Private Collector	1
	Art Enthusiast	3
	Museum	5
	Corporate Collection	7
	Art Collector	9
	Gallery	2
	Private Collector	4
	Art Enthusiast	6
	Museum	8
	Corporate Collection	10

INSERT INTO Patrons (artist_name, amount) VALUES

('John Doe', 5000.00),

('Jane Smith', 7500.00),

('Michael Johnson', 3000.00),

('Emily Brown', 4000.00),

('David Lee', 6000.00),

('Sarah Taylor', 3500.00),

('Robert Wilson', 4500.00),

('Emma Garcia', 3800.00),

('Daniel Clark', 4200.00),

('Olivia Martinez', 5500.00);

	artist_name	amount
▶	John Doe	5000.00
	Jane Smith	7500.00
	Michael Johnson	3000.00
	Emily Brown	4000.00
	David Lee	6000.00
	Sarah Taylor	3500.00
	Robert Wilson	4500.00
	Emma Garcia	3800.00
	Daniel Clark	4200.00
	Olivia Martinez	5500.00

INSERT INTO Staff (emp_id, name, department, salary, gallery_id) VALUES

(1, 'John Smith', 'Administration', 45000.00, 1),

(2, 'Emma Johnson', 'Curatorial', 50000.00, 2),

(3, 'Michael Williams', 'Marketing', 48000.00, 3),

(4, 'Sarah Brown', 'Education', 47000.00, 4),

(5, 'David Taylor', 'Maintenance', 46000.00, 5),

(6, 'Jessica Lee', 'Security', 44000.00, 6),

(7, 'Daniel Clark', 'Hospitality', 46000.00, 7),

(8, 'Olivia Martinez', 'Events', 47000.00, 8),

(9, 'James Wilson', 'Finance', 49000.00, 9),

(10, 'Emily Garcia', 'IT', 51000.00, 10);

emp_id	name	department	salary	gallery_id
1	John Smith	Administration	45000.00	1
2	Emma Johnson	Curatorial	50000.00	2
3	Michael Williams	Marketing	48000.00	3
4	Sarah Brown	Education	47000.00	4
5	David Taylor	Maintenance	46000.00	5
6	Jessica Lee	Security	44000.00	6
7	Daniel Clark	Hospitality	46000.00	7
8	Olivia Martinez	Events	47000.00	8
9	James Wilson	Finance	49000.00	9
10	Emily Garcia	IT	51000.00	10
NULL	NULL	NULL	NULL	NULL

INSERT INTO Exhibitions (exhibition_id, date, exhibition_name, exhibition_theme, location, gallery_id) VALUES

(1, '2024-05-01', 'Abstract Visions', 'Exploring abstract art forms', 'Main Exhibition Hall', 1),

(2, '2024-06-15', 'Sculptural Wonders', 'Showcasing diverse sculptures', 'Grand Gallery', 2),

(3, '2024-07-20', 'Portraits Unveiled', 'Highlighting the art of portraiture', 'Portrait Gallery', 3),

(4, '2024-08-10', 'Mixed Media Magic', 'Celebrating innovation in mixed media', 'Contemporary Wing', 4),

(5, '2024-09-05', 'Immersive Experiences', 'Engaging visitors in interactive installations', 'Interactive Zone', 5),

(6, '2024-10-15', 'Contemporary Landscapes', 'Interpreting landscapes in contemporary art', 'Landscape Pavilion', 6),

(7, '2024-11-20', 'Digital Frontiers', 'Exploring the intersection of art and technology', 'Digital Gallery', 7),

(8, '2024-12-10', 'Ceramics Showcase', 'Showcasing the beauty of ceramics', 'Ceramics Hall', 8),

(9, '2025-01-15', 'Urban Expressions', 'Reflecting urban culture through street art', 'Street Art Alley', 9),

(10, '2025-02-20', 'Earth Art Symposium', 'Celebrating art created within and inspired by nature', 'Nature Reserve', 10);

exhibition_id	date	exhibition_name	exhibition_theme	location	gallery_id
1	2024-05-01	Abstract Visions	Exploring abstract art forms	Main Exhibition Hall	1
2	2024-06-15	Sculptural Wonders	Showcasing diverse sculptures	Grand Gallery	2
3	2024-07-20	Portraits Unveiled	Highlighting the art of portraiture	Portrait Gallery	3
4	2024-08-10	Mixed Media Magic	Celebrating innovation in mixed media	Contemporary Wing	4
5	2024-09-05	Immersive Experiences	Engaging visitors in interactive installations	Interactive Zone	5
6	2024-10-15	Contemporary Landscapes	Interpreting landscapes in contemporary art	Landscape Pavilion	6
7	2024-11-20	Digital Frontiers	Exploring the intersection of art and technology	Digital Gallery	7
8	2024-12-10	Ceramics Showcase	Showcasing the beauty of ceramics	Ceramics Hall	8
9	2025-01-15	Urban Expressions	Reflecting urban culture through street art	Street Art Alley	9
10	2025-02-20	Earth Art Symposium	Celebrating art created within and inspired by n...	Nature Reserve	10
NULL	NULL	NULL	NULL	NULL	NULL

INSERT INTO Collaborations (gallery_id, gallery_name, project) VALUES

(1, 'Art Gallery One', 'Community Art Project'),

(2, 'Modern Art Museum', 'Community Art Project'),

(3, 'Contemporary Art Center', 'Artist Residency Program'),

(4, 'City Art Space', 'Public Art Installation Initiative'),

(5, 'Metropolitan Gallery', 'Artist Residency Program'),

(6, 'Urban Art Hub', 'Street Art Festival'),

(7, 'Creative Art Studio', 'Digital Art Workshop Series'),

(8, 'Gallery X', 'Public Art Installation Initiative'),

(9, 'Artistic Vision Gallery', 'Street Art Festival'),

(10, 'Expressive Arts Center', 'Public Art Installation Initiative');

gallery_id	gallery_name	project
1	Art Gallery One	Community Art Project
2	Modern Art Museum	Community Art Project
3	Contemporary Art Center	Artist Residency Program
4	City Art Space	Public Art Installation Initiative
5	Metropolitan Gallery	Artist Residency Program
6	Urban Art Hub	Street Art Festival
7	Creative Art Studio	Digital Art Workshop Series
8	Gallery X	Public Art Installation Initiative
9	Artistic Vision Gallery	Street Art Festival
10	Expressive Arts Center	Public Art Installation Initiative

INSERT INTO Visitors (date, name, gallery_id) VALUES

('2024-05-02', 'John Smith', 1),

('2024-06-16', 'Emma Johnson', 2),

('2024-07-21', 'Michael Williams', 1),

('2024-08-11', 'Sarah Brown', 4),

('2024-09-06', 'David Taylor', 5),

('2024-10-16', 'Jessica Lee', 1),

('2024-11-21', 'Daniel Clark', 1),

('2024-12-11', 'Olivia Martinez', 1),

('2025-01-16', 'James Wilson', 1),

('2025-02-21', 'Emily Garcia', 6);

date	name	gallery_id
2024-05-02	John Smith	1
2024-06-16	Emma Johnson	2
2024-07-21	Michael Williams	1
2024-08-11	Sarah Brown	4
2024-09-06	David Taylor	5
2024-10-16	Jessica Lee	1
2024-11-21	Daniel Clark	1
2024-12-11	Olivia Martinez	1
2025-01-16	James Wilson	1
2025-02-21	Emily Garcia	6

INSERT INTO Branches (city, country, gallery_id) VALUES

('Mumbai', 'India', 1),

('Bangalore', 'India', 2),

('Chennai', 'India', 3),

('Kolkata', 'India', 4),

('Mumbai', 'India', 5),

('London', 'UK', 6),

('Milan', 'France', 7),

('Sydney', 'Australia', 8),

('Kolkata', 'India', 9),

('Kolkata', 'India', 10);

city	country	gallery_id
Mumbai	India	1
Bangalore	India	2
Chennai	India	3
Kolkata	India	4
Mumbai	India	5
London	UK	6
Milan	France	7
Sydney	Australia	8
Kolkata	India	9
Kolkata	India	10

INSERT INTO Affiliations (college_id, college_name, point_of_contact, gallery_id) VALUES

(1, 'Art College One', 'John Doe', 1),

(2, 'Modern Art Institute', 'Jane Smith', 2),

(3, 'Contemporary Art School', 'Michael Johnson', 3),

(4, 'City Art Academy', 'Emily Brown', 4),

(5, 'Metropolitan School of Art', 'David Lee', 5),

(6, 'Urban Art Institute', 'Sarah Taylor', 6),

(7, 'Creative Art College', 'Robert Wilson', 7),

(8, 'Gallery Arts Center', 'Emma Garcia', 8),

(9, 'Expressive Art School', 'Daniel Clark', 9),

(10, 'Nature Art Institute', 'Olivia Martinez', 10);

college_id	college_name	point_of_contact	gallery_id
1	Art College One	John Doe	1
2	Modern Art Institute	Jane Smith	2
3	Contemporary Art School	Michael Johnson	3
4	City Art Academy	Emily Brown	4
5	Metropolitan School of Art	David Lee	5
6	Urban Art Institute	Sarah Taylor	6
7	Creative Art College	Robert Wilson	7
8	Gallery Arts Center	Emma Garcia	8
9	Expressive Art School	Daniel Clark	9
10	Nature Art Institute	Olivia Martinez	10
NULL	NULL	NULL	NULL

INSERT INTO Curators (id, name, specialization, art_id) VALUES

(1, 'Emma Wilson', 'Abstract Art', 1),

(2, 'Benjamin Hayes', 'Sculpture', 2),

(3, 'Olivia Reynolds', 'Portraiture', 3),

(4, 'Ethan Carter', 'Mixed Media', 4),

(5, 'Ava Phillips', 'Installation Art', 5),

(6, 'William Brooks', 'Contemporary Art', 6),

(7, 'Sophia Mitchell', 'Digital Art', 7),

(8, 'James Richardson', 'Ceramics', 8),

(9, 'Mia Morgan', 'Street Art', 9),

(10, 'Alexander Thompson', 'Land Art', 10);

id	name	specialization	art_id
1	Emma Wilson	Abstract Art	1
2	Benjamin Hayes	Sculpture	2
3	Olivia Reynolds	Portraiture	3
4	Ethan Carter	Mixed Media	4
5	Ava Phillips	Installation Art	5
6	William Brooks	Contemporary Art	6
7	Sophia Mitchell	Digital Art	7
8	James Richardson	Ceramics	8
9	Mia Morgan	Street Art	9
10	Alexander Thompson	Land Art	10
NULL	NULL	NULL	NULL

INSERT INTO PRM VALUES

('#ArtGalleryOne', 'Sponsored by Local Businesses', 1),

('#CommunityArt', 'Sponsored by Local Businesses', 1),

('#ModernArtMuseum', 'Supported by Government Grant', 2),

('#Education', 'Supported by Government Grant', 2),

('#ContemporaryArtCenter', 'Funded by Private Foundation', 3),

('#ArtistResidency', 'Funded by Private Foundation', 3),

('#CityArtSpace', 'Corporate Sponsorship', 4),

('#PublicArt', 'Corporate Sponsorship', 4),

('#MetropolitanGallery', 'Collaboration with International Partners', 5),

('#CulturalExchange', 'Collaboration with International Partners', 5),

('#UrbanArtHub', 'Local Municipality Support', 6),

('#StreetArt', 'Local Municipality Support', 6),

('#CreativeArtStudio', 'Technology Company Sponsorship', 7),

('#DigitalArt', 'Technology Company Sponsorship', 7),

('#GalleryX', 'Arts Council Grant', 8),

('#CeramicsSymposium', 'Arts Council Grant', 8),

('#ArtisticVisionGallery', 'Private Patron Support', 9),

('#ContemporaryArt', 'Private Patron Support', 9),

('#ExpressiveArtsCenter', 'Environmental Organization Sponsorship', 10),

('#NatureArt', 'Environmental Organization Sponsorship', 10);

social_media_hashtags	sponsorship_details	gallery_id
#ArtGalleryOne	Sponsored by Local Businesses	1
#CommunityArt	Sponsored by Local Businesses	1
#ModernArtMuseum	Supported by Government Grant	2
#Education	Supported by Government Grant	2
#ContemporaryArtCenter	Funded by Private Foundation	3
#ArtistResidency	Funded by Private Foundation	3
#CityArtSpace	Corporate Sponsorship	4
#PublicArt	Corporate Sponsorship	4
#MetropolitanGallery	Collaboration with International Partners	5
#CulturalExchange	Collaboration with International Partners	5
#UrbanArtHub	Local Municipality Support	6
#StreetArt	Local Municipality Support	6
#CreativeArtStudio	Technology Company Sponsorship	7
#DigitalArt	Technology Company Sponsorship	7
#GalleryX	Arts Council Grant	8
#CeramicsSymposium	Arts Council Grant	8
#ArtisticVisionGallery	Private Patron Support	9
#ContemporaryArt	Private Patron Support	9
#ExpressiveArtsCenter	Environmental Organization Sponsorship	10

INSERT INTO Project_Assigned VALUES

(1, 1),

(2, 2),

(3, 3),

(4, 4),

(5, 5),

(6, 6),

(7, 7),

(8, 8),

    (9, 9),

    (10, 10);

project_id	emp_id
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
NULL	NULL

INSERT INTO Project_Details VALUES

    (1, 'Art Exhibition', 'Organize an art exhibition featuring local artists.', '2024-06-10', 'In Progress'),

    (2, 'Art Restoration Project', 'Restore and preserve valuable artworks in the gallery collection.', '2024-06-15', 'Completed'),

    (3, 'Public Art Installation', 'Coordinate the installation of public art pieces in the city.', '2024-06-20', 'Pending'),

    (4, 'Art Workshop Series', 'Plan and conduct a series of art workshops for children and adults.', '2024-06-25', 'In Progress'),

    (5, 'Art Acquisition Initiative', 'Research and acquire new artworks to enrich the gallery collection.', '2024-06-30', 'Completed'),

    (6, 'Art Education Program', 'Develop and implement educational programs focused on art appreciation.', '2024-07-05', 'Pending'),

    (7, 'Artists-in-Residence Program', 'Establish a residency program for emerging artists.', '2024-07-10', 'In Progress'),

    (8, 'Art Marketing Campaign', 'Launch a marketing campaign to promote upcoming art events.', '2024-07-15', 'Completed'),

    (9, 'Art Auction Fundraiser', 'Organize an art auction to raise funds for charity.', '2024-07-20', 'Pending'),

(10, 'Digital Art Exhibition', 'Curate an exhibition showcasing digital artworks and interactive installations.', '2024-07-25', 'In Progress');

	project_id	project_name	project_description	project_due_date	project_status
▶	1	Art Exhibition	Organize an art exhibition featuring local artists.	2024-06-10	In Progress
	2	Art Restoration Project	Restore and preserve valuable artworks in the ...	2024-06-15	Completed
	3	Public Art Installation	Coordinate the installation of public art pieces in...	2024-06-20	Pending
	4	Art Workshop Series	Plan and conduct a series of art workshops for ...	2024-06-25	In Progress
	5	Art Acquisition Initiative	Research and acquire new artworks to enrich th...	2024-06-30	Completed
	6	Art Education Program	Develop and implement educational programs fo...	2024-07-05	Pending
	7	Artists-in-Residence Program	Establish a residency program for emerging arti...	2024-07-10	In Progress
	8	Art Marketing Campaign	Launch a marketing campaign to promote upco...	2024-07-15	Completed
	9	Art Auction Fundraiser	Organize an art auction to raise funds for charity.	2024-07-20	Pending
	10	Digital Art Exhibition	Curate an exhibition showcasing digital artwork...	2024-07-25	In Progress
*	NULL	NULL	NULL	NULL	NULL

INSERT INTO Employee_Details VALUES

(1, 'John Doe', 'Marketing'),

(2, 'Jane Smith', 'Finance'),

(3, 'Alice Johnson', 'HR'),

(4, 'Bob Brown', 'Operations'),

(5, 'Emily Davis', 'Marketing'),

(6, 'Michael Wilson', 'Finance'),

(7, 'Sophia Martinez', 'HR'),

(8, 'William Anderson', 'Operations'),

(9, 'Olivia Taylor', 'Marketing'),

(10, 'James Thomas', 'Finance');

	emp_id	emp_name	department
▶	1	John Doe	Marketing
	2	Jane Smith	Finance
	3	Alice Johnson	HR
	4	Bob Brown	Operations
	5	Emily Davis	Marketing
	6	Michael Wilson	Finance
	7	Sophia Martinez	HR
	8	William Anderson	Operations
	9	Olivia Taylor	Marketing
	10	James Thomas	Finance
*	NULL	NULL	NULL

- Running SQL queries

/*1. The 'Digital Art Workshop Series' has unfortunately been canceled. Update the database accordingly.*/

DELETE FROM collaborations WHERE project="Digital Art Workshop Series";

	gallery_id	gallery_name	project
▶	1	Art Gallery One	Community Art Project
	2	Modern Art Museum	Community Art Project
	3	Contemporary Art Center	Artist Residency Program
	4	City Art Space	Public Art Installation Initiative
	5	Metropolitan Gallery	Artist Residency Program
	6	Urban Art Hub	Street Art Festival
	8	Gallery X	Public Art Installation Initiative
	9	Artistic Vision Gallery	Street Art Festival
	10	Expressive Arts Center	Public Art Installation Initiative

/*2. John Smith's salary got incremented by Rs.1000. Update the database accordingly.*/

UPDATE staff SET salary=salary+1000 WHERE Name="John Smith";

emp_id	name	department	salary	gallery_id
1	John Smith	Administration	46000.00	1
NULL	NULL	NULL	NULL	NULL

/*3. A client wishes to look into all exhibitions taking place after 01/09/2024. Provide details accordingly.*/

SELECT * FROM exhibitions WHERE date>'2024-09-01';

exhibition_id	date	exhibition_name	exhibition_theme	location	gallery_id
5	2024-09-05	Immersive Experiences	Engaging visitors in interactive installations	Interactive Zone	5
6	2024-10-15	Contemporary Landscapes	Interpreting landscapes in contemporary art	Landscape Pavilion	6
7	2024-11-20	Digital Frontiers	Exploring the intersection of art and technology	Digital Gallery	7
8	2024-12-10	Ceramics Showcase	Showcasing the beauty of ceramics	Ceramics Hall	8
9	2025-01-15	Urban Expressions	Reflecting urban culture through street art	Street Art Alley	9
10	2025-02-20	Earth Art Symposium	Celebrating art created within and inspired by n...	Nature Reserve	10
NULL	NULL	NULL	NULL	NULL	NULL

/*4. Display all patrons in decreasing order of the amount of patronage.*/

SELECT * FROM patrons ORDER BY amount DESC;

artist_name	amount
Jane Smith	7500.00
David Lee	6000.00
Olivia Martinez	5500.00
John Doe	5000.00
Robert Wilson	4500.00
Daniel Clark	4200.00
Emily Brown	4000.00
Emma Garcia	3800.00
Sarah Taylor	3500.00
Michael Johnson	3000.00

/*5. Find the total number of artworks sold by each seller.*/

SELECT purchases, COUNT(*) AS total_sold_artworks FROM Sellers GROUP BY purchases;

purchases	total_sold_artworks
Private Collector	2
Art Enthusiast	2
Museum	2
Corporate Collection	2
Art Collector	1
Gallery	1

/*6. How many artworks are currently in Gallery One?*/

SELECT COUNT(art_id) FROM artworks WHERE gallery_id=1;

count(art_id)
1

/*7. Retrieve all the artworks created by a specific artist.*/

SELECT * FROM Artworks WHERE artist_id = (SELECT artist_id FROM Artists WHERE artist_name = 'Emily Brown');

OR

SELECT * FROM Artworks WHERE artist_name = 'Emily Brown';

art_id	title	artist_name	artist_id	year	description	gallery_id
4	Mixed Media II	Emily Brown	4	2021	Mixed media collage	4
NULL	NULL	NULL	NULL	NULL	NULL	NULL

/*8. List all the galleries with their affiliated colleges.*/

SELECT g.name AS gallery_name, a.college_name FROM Gallery g JOIN Affiliations a ON g.gallery_id = a.gallery_id;

gallery_name	college_name
Art Gallery One	Art College One
Modern Art Museum	Modern Art Institute
Contemporary Art Center	Contemporary Art School
City Art Space	City Art Academy
Metropolitan Gallery	Metropolitan School of Art
Urban Art Hub	Urban Art Institute
Creative Art Studio	Creative Art College
Gallery X	Gallery Arts Center
Artistic Vision Gallery	Expressive Art School
Expressive Arts Center	Nature Art Institute

/*9. List all the exhibitions visited by a particular visitor.*/

SELECT e.exhibition_name, e.date FROM Exhibitions e JOIN Visitors v ON e.gallery_id = v.gallery_id WHERE v.name = 'John Smith';

exhibition_name	date
Abstract Visions	2024-05-01

/*10. Find the names of all the artists who have created artworks exhibited in the same gallery as the exhibition named 'Abstract Visions'.*/

SELECT artist_name FROM Artworks WHERE gallery_id = (

    SELECT gallery_id FROM Exhibitions WHERE exhibition_name = 'Abstract Visions'

  );

artist_name
John Doe

/*11. Find the total number of artworks exhibited in each location. */

SELECT location, COUNT(*) AS total_exhibited_artworks FROM Exhibitions GROUP BY location;

location	total_exhibited_artworks
Main Exhibition Hall	1
Grand Gallery	1
Portrait Gallery	1
Contemporary Wing	1
Interactive Zone	1
Landscape Pavilion	1
Digital Gallery	1
Ceramics Hall	1
Street Art Alley	1
Nature Reserve	1

/*12. List all the collections with a specific theme. */

SELECT * FROM Collections WHERE collection_theme = 'Exploring the realm of abstract art';

collection_id	collection_name	collection_theme
1	Abstract Expressions	Exploring the realm of abstract art
NULL	NULL	NULL

/*13. Retrieve the names of all the artworks with titles containing the word 'portrait'. */

SELECT * FROM Artworks WHERE title LIKE '%portrait%';

art_id	title	artist_name	artist_id	year	description	gallery_id
3	Portrait of a Lady	Michael Johnson	3	2019	Photorealistic portrait in oil	3
NULL	NULL	NULL	NULL	NULL	NULL	NULL

/*14. Rank salaries of all staff. */

SELECT emp_id,salary,rank() over(order by salary) FROM staff;

	emp_id	salary	rank() over(order by salary)
▶	6	44000.00	1
	1	46000.00	2
	5	46000.00	2
	7	46000.00	2
	4	47000.00	5
	8	47000.00	5
	3	48000.00	7
	9	49000.00	8
	2	50000.00	9
	10	51000.00	10

/*15. Find out top 3 patronage amount*/

SELECT artist_name, amount FROM Patrons ORDER BY amount DESC LIMIT 3;

	artist_name	amount
▶	Jane Smith	7500.00
	David Lee	6000.00
	Olivia Martinez	5500.00

/*16. Create view containing only artwork title and description. */

CREATE VIEW artworks_vw AS SELECT art_id,title,description FROM artworks;

SELECT * FROM artworks_vw;

	art_id	title	description
▶	1	Untitled	Abstract painting on canvas
	2	Sculpture I	Bronze sculpture of a woman
	3	Portrait of a Lady	Photorealistic portrait in oil
	4	Mixed Media II	Mixed media collage
	5	Installation III	Interactive installation using mirrors
	6	Abstract Landscape	Contemporary landscape painting
	7	Digital Artwork I	Digital artwork exploring AI
	8	Ceramic Vase	Handcrafted ceramic vase
	9	Street Mural	Graffiti mural depicting city life
	10	Land Art Installation	Outdoor land art installation

/*17. Find the artists whose birth year is greater than all the birth years of artists named 'John Doe'. */

```
SELECT artist_name FROM Artists WHERE birthdate > ALL (

    SELECT birthdate FROM Artists WHERE artist_name = 'John Doe'

);
```

	artist_name
▶	Emily Brown
	Robert Wilson
	Olivia Martinez

/*18. Retrieve the names of all the galleries that either host exhibitions or collaborate with other galleries. */

```
SELECT name FROM Gallery WHERE gallery_id IN (

    SELECT gallery_id FROM Exhibitions

    UNION

    SELECT gallery_id FROM Collaborations

);
```

	name
▶	Art Gallery One
	Modern Art Museum
	Contemporary Art Center
	City Art Space
	Metropolitan Gallery
	Urban Art Hub
	Creative Art Studio
	Gallery X
	Artistic Vision Gallery
	Expressive Arts Center

/*19. Find the names of all the galleries that both host exhibitions and collaborate with other galleries. */

```
SELECT name FROM Gallery WHERE gallery_id IN (

    SELECT gallery_id FROM Exhibitions
```

INTERSECT

SELECT gallery_id FROM Collaborations

);

name
▶ Art Gallery One
Modern Art Museum
Contemporary Art Center
City Art Space
Metropolitan Gallery
Urban Art Hub
Gallery X
Artistic Vision Gallery
Expressive Arts Center

/*20. Grant permission to the user 'marketing_team' to select data from the 'Artworks' table. */

CREATE USER 'marketing_team'@'localhost' IDENTIFIED BY 'password';

GRANT SELECT ON project.Artworks TO 'marketing_team'@'localhost';

VI. Project demonstration

- Tools used

  1. draw.io for Entity-Relationship Diagram and Relational Model
  2. MySQL Workbench CE for queries

- Screenshot and Description of the Demonstration of the project (if GUI is made)

VII. Self -Learning beyond the classroom

The Art Gallery Management System exposed us to the real-world applications of database management. Implementing a DBMS project provides hands-on experience in solving real-world problems. This practical application helps reinforce theoretical knowledge gained in the classroom.

Projects often present challenges that require creative problem-solving skills. Dealing with issues such as database design, optimization, and performance tuning enhances critical thinking and the ability to develop effective solutions.

It also enables us to learn how to design and execute tests, identify bugs, and debug issues to improve the overall efficiency of the database.

VIII. Learning from the Project

Conceptual Understanding Reinforcement: Creating an Entity-Relationship diagram and converting it into a Relational Model allowed for a comprehensive understanding of how entities within a system are interrelated and how they can be represented in a database structure.

Normalization Principles: Applying normalization techniques helped minimize redundancy, and optimize database performance.

SQL Command Proficiency: Working with Data Definition Language (DDL), Data Manipulation Language (DML), and Data Control Language (DCL) commands in MySQL enabled the practical application of database operations.

Advanced Query Operations: Implementing various SQL clauses, join operations, aggregate functions, nested queries, set operations, views, ranking, and top-N queries enabled practical applications of advanced query operations.

Real-life Application Context: Applying database management concepts in the context of real-life scenarios, such as managing an art gallery, offered practical relevance to theoretical knowledge.

IX. Challenges Faced

Complex Relations between Entities: One of the challenges encountered in developing the Art Gallery Management System was comprehensively evaluating the various relations between multiple entities. Artworks, artists, customers, transactions, and exhibitions are all interconnected, requiring a nuanced understanding of their interactions.

Predictive Event Modeling: Predicting potential events within the art gallery ecosystem posed a significant challenge.

X. Conclusion

In conclusion, the development of the Art Gallery Management System represents a significant advancement in leveraging technology to enhance the operational efficiency and business performance of art galleries. By effectively cataloging artworks, managing artists and clients, optimizing inventory management, facilitating exhibition planning, and streamlining digital asset management, the system readily offers information at your fingertips.

Through the integration of a robust Database Management System (DBMS), galleries can effectively organize, retrieve, and utilize data pertaining to artworks, artists, clients, exhibitions, and digital assets. This centralized data management enables galleries to make informed decisions, improve customer service, and adapt to the dynamic demands of the art market.