

Project Title: ARTISTRY ARCHIVE

Art Gallery Database Management System

6320.002

Group 11

Members:

Nivas Annamreddy
Srijananie Nagasubburajan
Abin Roy
Shivani Sandeveni
Devarshi Trivedi

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MeetingTime

Meeting date / Member Joined:

09/18/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi(10mins)

09/23/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi (30mins)

10/03/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi (2hr)

10/07/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi (teams)

10/17/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi (1hr) (teams)

10/24/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi(1hr) (teams)

10/31/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi (35min) (teams)

11/07/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi(30min) (teams)

11/14/2024 Member: Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi (40min) (teams)

Roles and Responsibilities

Task	Member
Planning Schema	Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi
Coding Database Structure	Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi
Coding tables	Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy
Procedures	Abin Roy
Triggers	Nivas Annamreddy
Sample data	Srijananie Nagasubburajan
Functions	Shivani Sandeveni
Views	Nivas Annamreddy, Srijananie Nagasubburajan, Abin Roy, Shivani Sandeveni, Devarshi Trivedi
Queries	Devarshi Trivedi

Project Charter

Project Objective:

Explain the specific objectives of the project. For example: What value does this project add to the organization? How does this project align with the organization's strategic priorities? What results are expected? What are the deliverables? What benefits will be realized? What problems will be resolved?

The primary objective of this project is to develop a robust and scalable Art Gallery Management System that centralizes the management of artwork inventory, exhibitions, and sales. The system will provide the following benefits:

- Improved management of artist portfolios and artwork inventories.
- Streamlined exhibition scheduling and event management.
- Enhanced ability to track and record art sales and visitor engagement.

Generation of insightful reports to assist gallery owners and managers in making informed decisions. This system will improve operational efficiency, reduce manual errors, and provide a better overall experience for gallery staff, artists, and visitors.

Assumption:

List and describe the assumptions made in the decision to charter this project. All assumptions must be validated to ensure the project stays on schedule and budget.

- The gallery has access to an existing database or will set up a new one
- All stakeholders (gallery owners, managers, and artists) will provide the necessary data to populate the system.
- The system will be deployed on a local server or a cloud environment, depending on the gallery's requirements.
- Adequate resources (developers, testers, and end users) will be available for the project's duration.

Project Scope:

Real-Time Data Integration: Real-time data synchronization and third-party platform integration are not part of this project phase.

Advanced Analytics: Predictive analytics, machine learning, or advanced reporting

capabilities beyond basic data insights are not included.

Cloud Deployment: The database is not yet optimized for cloud deployment or large-scale data handling; scalability will be addressed in future phases.

Project Milestone:

Milestone	Deliverables	Date
Start Charter	Project Objective, Descriptions	09/18/24
Start drawing schema	Breakdown Objectives into the schema	09/23/24
Refine table structure	Get to 15 tables, 10 queries, sample data	10/10/24
Start to work on functions, procedures, triggers	Finish 3 procedures, 3 triggers, 3 functions	10/17/24
Finalize database	Finish 3 procedures, 3 triggers, 3 functions, and 10 complex queries, and prepare for presentation	10/24/24
Start working on the presentation	Group members signup to present different parts of the Project	10/31/24
Presentation Preparation	Make sure the code runs without error	11/07/24
Presentation Preparation	Mock presentation and Finalize everything before present. Start on the Final report	11/14/24
Video Preparation	Brainstorm before shooting Video, and script writing.	11/21/24
Thanksgiving Break	Finalize Video and Report	11/28/24
Delivery	Final Report ready	12/05/24

Project Writeup

Project Overview

The **Artistry Archive** project is designed to serve as a robust and scalable database management system for modern art galleries, museums, and art-related institutions. It enables the efficient management of art collections, artist portfolios, exhibition schedules, and sales transactions. By centralizing these critical data points, the system facilitates easy access to vital information, enhances operational efficiency, and supports informed decision-making.

This outlines the design, scope, and architecture of the database layer of the Artistry Archive, focusing on its ability to store, retrieve, and manage vast amounts of structured art-related data.

Scope of the Project

Art Collection Management: Storing detailed records of art pieces, including title, artist, medium, dimensions, and creation date, to facilitate efficient cataloging and retrieval.

Artist Information: Maintaining comprehensive profiles of artists, including biographical data, exhibition history, and artworks created, to support artist-related research and gallery presentations.

Exhibition Tracking: Capturing exhibition schedules, artwork displays, and artist participation, enabling effective planning and tracking of gallery events.

Sales Transactions: Documenting artwork sales, including buyer details, sale price, and transaction date, to track financial performance and monitor market trends.

Inventory Control: Managing artwork availability across exhibitions and sales, ensuring up-to-date tracking of artworks in circulation.

Data Integrity: Ensuring data consistency through relational database design, with normalized tables and foreign key relationships to minimize redundancy and maintain accuracy.

Reporting and Analytics: Generating reports on exhibitions, artist performance, sales trends, and artwork availability to support decision-making and gallery operations.

Security and Access Control: Implementing role-based access and encryption to secure sensitive information, such as financial transactions and buyer data, ensuring confidentiality and compliance.

Future Integration: Designed for easy integration with future User Interface (UI) and business logic layers, enabling seamless interaction with external systems and providing a foundation for advanced features.

Target Customer

The **Artistry Archive** system is targeted at professionals in the art and museum industries, including:

- **Art Galleries:** To catalog and manage collections of artworks, track artists, and streamline exhibition planning.
- **Museum Curators and Administrators:** For organizing and managing vast amounts of art-related data, including artist details, artwork specifications, and exhibition schedules.
- **Auction Houses and Art Dealers:** To track artwork sales, manage transaction histories, and monitor artworks' performance in the market.
- **Art Researchers and Historians:** Who require access to detailed metadata about artworks and artists for scholarly purposes.

Design Philosophy

The database architecture for the Artistry Archive follows a clear design philosophy focused on data integrity, scalability, and user adaptability. The system's relational design is intended to ensure accurate, consistent data management and streamline future system enhancements.

Key principles include:

- **Normalization:** Data is normalized to avoid redundancy and ensure consistency across the system. This approach supports efficient storage, quick access, and reliable data updates.
- **Scalability:** The database is designed to handle increasing volumes of artwork data and support integration with future systems such as sales platforms or external databases.
- **Security:** Built-in access control mechanisms and encryption ensure sensitive data (e.g., transaction details, buyer information) is secure and managed appropriately.
- **Extensibility:** The database schema is designed with flexibility in mind, making it adaptable for future features such as integration with cloud services, advanced reporting tools, and third-party APIs.

Product Growth Plan for Development Teams

1. Database Design and Development

- Objective: Develop a core database schema with normalized tables for Artists, Artworks, Exhibitions, and Sales.
- Deliverables: Database schema, CRUD operations, basic reporting functionality.

2. UI and Application Layer Integration

- Objective: Enable seamless data interaction via API endpoints, integrating with front-end UI and business logic.
- Deliverables: API documentation, UI wireframes, data access endpoints.

3. Analytics and Reporting

- Objective: Implement data analytics and reporting features for tracking sales, artist performance, and exhibition trends.
- Deliverables: Dashboards, custom reports, automated alerts.

4. Security and Compliance

- Objective: Enhance data security with role-based access, encryption, and regulatory compliance.
- Deliverables: Security framework, encrypted transaction data, compliance audit.

5. Cloud Deployment and Scalability

- Objective: Migrate the database to the cloud for scalability, reliability, and disaster recovery.
- Deliverables: Cloud database setup, backup protocols, performance optimization.

6. Future Enhancements

- Objective: Expand system capabilities with machine learning for predictive analytics and integration with external platforms.
- Deliverables: Predictive models, third-party marketplace integration, mobile interface.

List of Tables

Tables

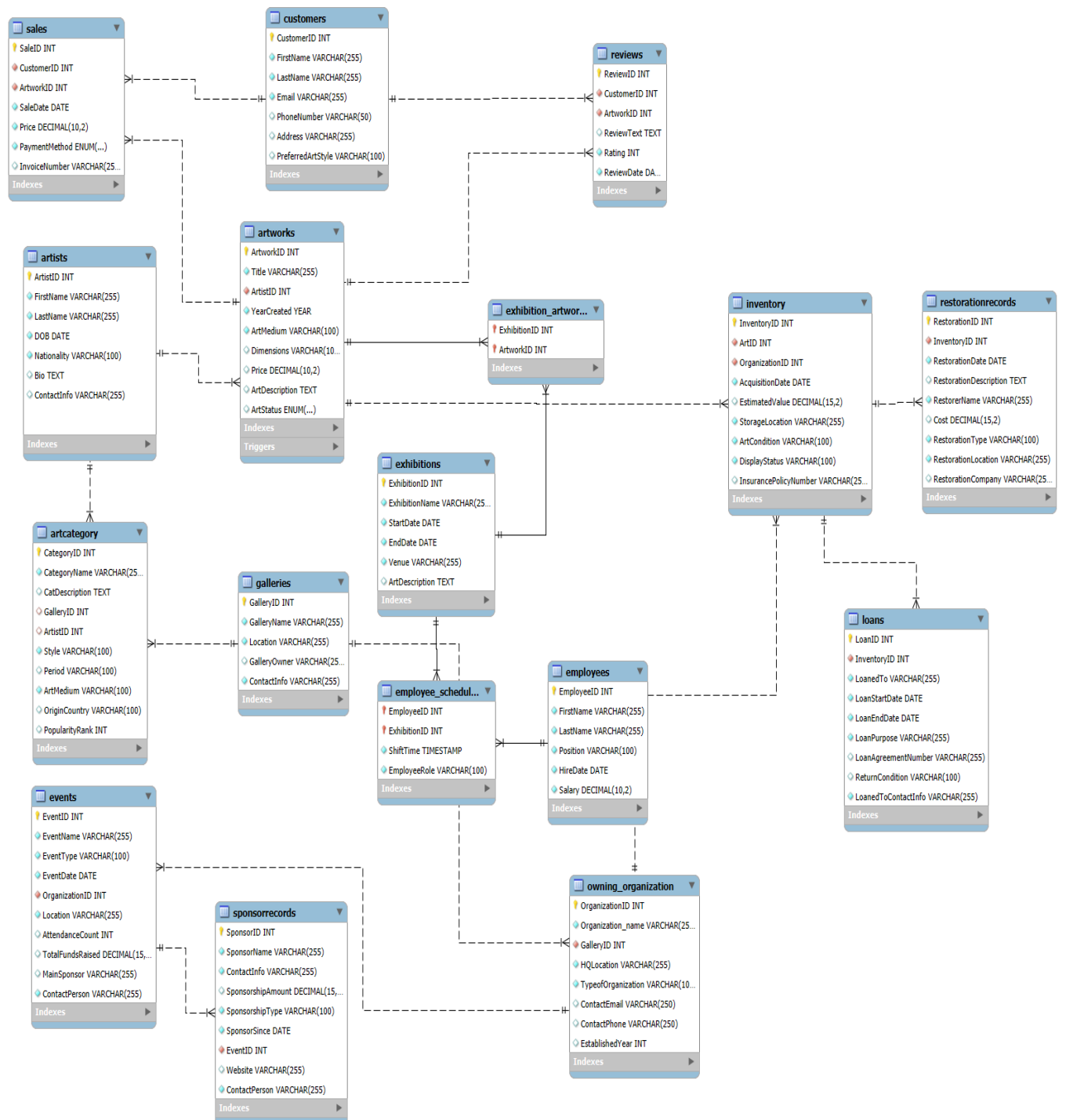
1. **Artcategory**: Categorizes artworks by style, period, medium, and origin, linking each category to specific galleries and artists.
2. **Artists**: Stores information about artists, including personal details, biography, and contact information.
3. **Artworks**: Stores information about artworks, including details about the artist, creation date, medium, and current status.
4. **Customers**: Stores information about customers, including contact details and preferences.
5. **Employee_schedules**: Tracks employee assignments to exhibitions, including the shift times and roles.
6. **Employees**: Stores information about employees, including their position, hire date, and salary details.
7. **Events**: Records details of events hosted or sponsored by the organization, including fundraisers, social gatherings, and charity events.
8. **Exhibition_artworks**: Establishes a many-to-many relationship between Exhibitions and Artworks, ensuring that each artwork can be associated with multiple exhibitions and each exhibition can feature multiple artworks.
9. **Exhibitions**: Stores information about exhibitions, including names, dates, venues, and descriptions.
10. **Galleries**: Stores information about galleries, including location, ownership, and contact details.
11. **Inventory**: Tracks the inventory of artworks, including acquisition details, storage, and condition.
12. **Loans**: Tracks loans of inventory items, including details about the recipient, loan dates, purpose, and condition upon return.
13. **Owning_organization**: Stores information about organizations that own galleries, including their headquarters location, type, contact information, and the galleries they manage.
14. **Restorationrecords**: Records details of restoration activities performed on inventory items, including costs, types, and restorer information.
15. **Reviews**: Stores customer reviews of artworks, including review text, rating, and review date.

16. **Sales:** Records the sale transactions of artworks to customers, including payment and invoice details.
17. **Sponsorrecords:** Tracks sponsors for events, including their contact information, type of sponsorship, and contribution details.

Views

1. **ActiveExhibitions:** The ActiveExhibitions view provides details of ongoing exhibitions, including associated artworks, their status, and pricing. This view joins the Exhibitions and Artworks tables through a linking table Exhibition_Artworks, filtering exhibitions that are currently active (based on date).
2. **ArtistProfiles:** The ArtistProfiles view aggregates information about artists, including the total count of their artworks and a concise profile (name, nationality, bio). This view joins the Artists table with the Artworks table using a LEFT JOIN to ensure that all artists are included, even those without any artworks.

ER Diagram



Views and Complex Queries

Views

- **ActiveExhibitions**

- The ActiveExhibitions view provides details of ongoing exhibitions, including associated artworks, their status, and pricing.
- **Key Data:** Fields such as ExhibitionName, StartDate, EndDate, Venue, and artwork-related fields (e.g., Title, ArtMedium, Price, ArtStatus) provide comprehensive information for active exhibitions.

Table Code	<pre>-- Active Exhibitions CREATE VIEW ActiveExhibitions AS SELECT e.ExhibitionID, e.ExhibitionName, e.StartDate, e.EndDate, e.Venue, a.ArtworkID, a.Title AS ArtworkTitle, a.ArtMedium, a.Price, a.ArtStatus FROM Exhibitions e JOIN Exhibition_Artworks ea ON e.ExhibitionID = ea.ExhibitionID JOIN Artworks a ON ea.ArtworkID = a.ArtworkID WHERE CURRENT_DATE BETWEEN e.StartDate AND e.EndDate;</pre>
Example	<pre>-- To retrieve data from the view SELECT * FROM ActiveExhibitions;</pre>

Output

ArtID	ExhibitionName	StartDate	EndDate	Venue	ArtworkID	ArtworkTitle	ArtMedium	Price	ArtStatus
1	The Power of Color	2024-10-01	2024-10-31	Art Place	1	Landscapes of Time	Oil Painting	200,000	Available

- **ArtistProfiles**

- The ArtistProfiles view aggregates information about artists, including the total count of their artworks and a concise profile (name, nationality, bio).
- **Key Data:** This view joins the **Artists** table with the **Artworks** table using a LEFT JOIN to ensure that all artists are included, even those without any artworks.

Table Code	<pre>-- ArtistProfiles CREATE VIEW ArtistProfiles AS SELECT ar.ArtistID, CONCAT(ar.FirstName, ' ', ar.LastName) AS FullName, ar.Nationality, ar.Bio, COUNT(aw.ArtworkID) AS ArtworkCount FROM Artists ar LEFT JOIN Artworks aw ON ar.ArtistID = aw.ArtistID GROUP BY ar.ArtistID, ar.FirstName, ar.LastName, ar.Nationality, ar.Bio;</pre>
Example	SELECT * FROM ArtistProfiles;
Output	

ArtistID	FirstName	LastName	Biography	ArtworkCount
1	John	Doe	A contemporary artist known for abstract paintings.	1
2	Jane	Smith	A minimalist artist known for her sculptures.	1
3	Mike	Johnson	A painter who focuses on nature in his work.	1
4	Emily	White	A photographer who captures urban scenes.	1
5	David	Green	A painter who specializes in portraiture and digital art.	1
6	Michael	Brown	A sculptor known for his large-scale outdoor pieces.	1
7	Sarah	Lee	A contemporary artist known for her mixed media work.	1
8	James	Wilson	A painter who focuses on abstract and digital art.	1
9	Anna	Miller	A sculptor who creates small-scale figurines.	1
10	Chris	Anderson	A painter who focuses on abstract and digital art.	1
11	Kevin	Taylor	A sculptor who creates large-scale outdoor pieces.	1
12	Olivia	Thomas	A contemporary artist known for her mixed media work.	1
13	Daniel	Roberts	A painter who focuses on abstract and digital art.	1
14	Michelle	Clark	A sculptor who creates small-scale figurines.	1
15	Robert	Walker	A painter who focuses on abstract and digital art.	1
16	Ashley	Hall	A sculptor who creates large-scale outdoor pieces.	1
17	Christopher	King	A contemporary artist known for her mixed media work.	1
18	Jessica	Young	A painter who focuses on abstract and digital art.	1
19	Anthony	Scott	A sculptor who creates small-scale figurines.	1
20	Alexander	Wells	A painter who focuses on abstract and digital art.	1
21	Isabella	Gold	A sculptor who creates large-scale outdoor pieces.	1
22	John	Doe	A contemporary artist known for abstract paintings.	1
23	Jane	Smith	A minimalist artist known for her sculptures.	1
24	Mike	Johnson	A painter who focuses on nature in his work.	1
25	Emily	White	A photographer who captures urban scenes.	1
26	David	Green	A painter who specializes in portraiture and digital art.	1
27	Michael	Brown	A sculptor known for his large-scale outdoor pieces.	1
28	Sarah	Lee	A contemporary artist known for her mixed media work.	1
29	James	Wilson	A painter who focuses on abstract and digital art.	1
30	Anna	Miller	A sculptor who creates small-scale figurines.	1
31	Chris	Anderson	A painter who focuses on abstract and digital art.	1
32	Kevin	Taylor	A sculptor who creates large-scale outdoor pieces.	1
33	Olivia	Thomas	A contemporary artist known for her mixed media work.	1

Complex Queries

- Comprehensive Artist Performance Report in Gallery Management**
 - This query calculates the total available value of artworks, the number of exhibitions, and the number of sold artworks for each artist.
 - Key Data:** Artist's first and last name, Total available value of artworks, Total number of exhibitions the artist has participated in and Total number of artworks sold by the artist
 - Purpose:** This query identifies artists with the highest value of available artworks, as well as their engagement in exhibitions and sales, which can be used for artist performance analysis, inventory management, and sales forecasting.

Query Code	<pre> SELECT Artists.FirstName, Artists.LastName, SUM(CASE WHEN Artworks.ArtStatus = 'available' THEN Artworks.Price ELSE 0.00 END) AS TotalAvailableValue, COUNT(DISTINCT exhibition_artworks.ExhibitionID) AS TotalExhibitions, COUNT(DISTINCT Sales.SaleID) AS TotalSoldArtworks FROM Artists LEFT JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID LEFT JOIN exhibition_artworks ON Artworks.ArtworkID = exhibition_artworks.ArtworkID LEFT JOIN Sales ON Artworks.ArtworkID = Sales.ArtworkID </pre>
------------	--

GROUP BY Artists.ArtistID,
Artists.FirstName, Artists.LastName
ORDER BY TotalAvailableValue DESC;

Output

Result Grid

Filter Rows:

Export:

Wrap Cell Content: 15

	ArtistID	FullName	Nationality	Bio	ArtworkCount
1	John Doe	American	A contemporary artist known for abstract paintings.	1	
2	Jane Smith	British	Specializes in modern sculptures.	1	
3	Alice Johnson	Canadian	A painter who captures nature in her works.	1	
4	Bob Brown	Australian	Known for his innovative mixed media art.	1	
5	Emily Davis	American	Focuses on photography and digital art.	1	
6	Michael Wilson	New Zealander	A renowned installation artist.	1	
7	Emma Garcia	Mexican	Creates vibrant murals and street art.	1	
8	Liam Martinez	Spanish	A versatile artist with a passion for ceramics.	1	
9	Olivia Anderson	American	Focuses on video art and performance.	1	
10	Noah Taylor	British	Known for minimalist art and design.	1	
11	Sophia Thomas	French	A contemporary artist specializing in prints.	1	

- **Comprehensive Analysis of Artist Event Participation, Sponsorship, and Artwork Value by Art Category**

- This query calculates the total events participated in, total sponsorship received, and the average price of available artworks for each artist, along with details about the owning organization, gallery, and art category.
- **Key Data:** Artist's name, total events participated, total sponsorship received, owning organization, gallery name and location, art category, and average available artwork price.
- **Purpose:** This query helps identify high-performing artists in terms of event participation and sponsorship, while also providing insights into their art category, gallery affiliations, and the value of their available artworks. It can be useful for performance analysis, sponsorship strategies, and gallery management.

Query Code	<pre> SELECT Artists.FirstName AS ArtistFirstname, Artists.LastName AS ArtistLastName, COUNT(DISTINCT Events.EventID) AS TotalEventsParticipated, SUM(sponsorrecords.SponsorshipAmount) AS TotalSponsorshipReceived, owning_organization.Organization_name AS OwningOrganization, galleries.GalleryName AS GalleryName, galleries.Location AS GalleryLocation, artcategory.CategoryName AS ArtCategory, AVG(Artworks.Price) AS AvgAvailableArtworkPrice FROM Events RIGHT JOIN owning_organization ON Events.OrganizationID = owning_organization.OrganizationID JOIN Galleries ON owning_organization.GalleryID = Galleries.GalleryID JOIN ArtCategory ON Galleries.GalleryID =ArtCategory.GalleryID </pre>
------------	--

LEFT JOIN sponsorrecords ON Events.EventID = sponsorrecords.EventID

LEFT JOIN artists ON ArtCategory.ArtistID = artists.ArtistID

LEFT JOIN Artworks ON Artists.ArtistID = Artworks.ArtistID AND Artworks.ArtStatus = 'available'

GROUP BY ArtistFirstname, ArtistLastName, OwningOrganization, GalleryName, ArtCategory

ORDER BY TotalSponsorshipReceived DESC, AvgAvailableArtworkPrice DESC;

Result kind

Filter Name

Reports

Group Col Contents

ArtistFirstname	ArtistLastName	TotalExhibitionsHosted	TotalSponsorshipReceived	OwningOrganization	GalleryName	ArtCategory	AvgAvailableArtworkPrice
Sophia	Thomas	1	10000.00	Legacy Art Holdings	Art Oasis	Romanticism	2500.000000
John	Johnson	1	9000.00	Old Masters Institute	Cultural Center	Expressionism	1800.000000
Alexander	Smith	1	15500.00	Cultural Innovations Group	Visionary Art Gallery	Cultural Block	1400.000000
John	Paul	1	7500.00	Royal Gallery Partners	Gallery X	City Park	1300.000000
John	Doe	1	10000.00	Global Vision Gallery	Modern Art Museum	City Center	1200.000000

- **Identifying High-Value and Active Artists for Strategic Focus**
 - This query calculates the total number of exhibitions, total artworks sold, and the average price of available artworks for each artist, along with exhibition details, filtering for artists with at least one exhibition and an average artwork price above 100.
 - **Key Data:** Artist's first and last name, total exhibitions participated, total artworks sold, average available artwork price, and exhibition name.
 - **Purpose:** This query identifies high-performing artists with significant exhibition and sales activity, and high-value available artworks, helping with artist performance analysis, exhibition planning, and sales strategies.

Query Code	<p>This query identifies high-performing artists with significant exhibition and sales activity, and high-value available artworks, helping with artist performance analysis, exhibition planning, and sales strategies.</p>
------------	--

Output

ArtistFirst Name	ArtistLast Name	TotalExhibitedArtworks	TotalArtworksSold	AvgAvailableArtworkPrice	ExhibitionName
Sophia	Thomas	1	1	2500.000000	Interactive Art
Sophia	Thomas	1	1	2500.000000	The Power of Color
Amelia	King	1	1	2200.000000	Art and Emotion
Amelia	King	1	1	2200.000000	The Narrative in Art
Alice	Johnson	1	1	1500.000000	Nature in Focus

● Revenue Optimization for Art Gallery Management

- This query calculates the potential revenue for each artist's available artworks based on their title and exhibition participation, filtering for artworks with potential revenue greater than 2000.
- **Key Data:** Artist's first and last name, artwork title, potential revenue (sum of artwork prices), and exhibition name.
- **Purpose:** This query helps identify artists with high-value available artworks and their exhibition involvement, providing insights into potential revenue generation, artist performance, and exhibition planning.

Query Code

```
SELECT Artists.FirstName AS
ArtistFirstName ,
Artists.LastName AS ArtistLastName ,
Artworks.Title AS ArtTitle
,SUM(Artworks.Price) AS
PotentialRevenue,
Exhibitions.ExhibitionName AS
ExhibitionName
FROM Artists
CROSS JOIN Artworks
LEFT JOIN Sales ON Artworks.ArtworkID
= Sales.ArtworkID
JOIN exhibition_artworks ON
Artworks.ArtworkID =
exhibition_artworks.ArtworkID
JOIN exhibitions ON
exhibition_artworks.ExhibitionID =
exhibitions.ExhibitionID
WHERE Artworks.ArtStatus = 'available'
GROUP BY Artists.FirstName,
Artists.LastName, Artworks.Title,
Exhibitions.ExhibitionName
HAVING PotentialRevenue > 2000
ORDER BY PotentialRevenue DESC;
```

Output

ArtistFirstName	ArtistLastName	ArtTitle	PotentialRevenue	ExhibitionName
John	Doe	Landscapes of Time	2500.00	Interactive Art
John	Doe	Landscapes of Time	2500.00	The Power of Color
Jane	Smith	Landscapes of Time	2500.00	Interactive Art
Jane	Smith	Landscapes of Time	2500.00	The Power of Color
Alice	Johnson	Landscapes of Time	2500.00	Interactive Art
Alice	Johnson	Landscapes of Time	2500.00	The Power of Color
Bob	Brown	Landscapes of Time	2500.00	Interactive Art
Bob	Brown	Landscapes of Time	2500.00	The Power of Color
Emily	Davis	Landscapes of Time	2500.00	Interactive Art
Emily	Davis	Landscapes of Time	2500.00	The Power of Color

- **Identifying High-Value Art Mediums and Standout Artworks**

- This query retrieves the top 3 sold artworks along with their artist details and compares each artwork's sale price with the average sold price for the same art medium.
- **Key Data:** Artwork title, artist's first and last name, artwork medium, sale price, and average sold price for the artwork medium.
- **Purpose:** This query helps identify high-value artworks within specific art mediums, comparing individual sale prices with the average prices of similar artworks, and providing insights into trends and artist performance.

Query Code

```
WITH MediumAvgPrice AS (
    SELECT artworks.ArtMedium AS
    ArtMedium , AVG(Sales.Price) AS
    AvgSoldPrice
    FROM Artworks
    JOIN Sales ON Artworks.ArtworkID =
    Sales.ArtworkID
    GROUP BY ArtMedium
)
SELECT Artworks.Title AS Arttitle,
Artists.FirstName AS ArtistFirstname ,
Artists.LastName AS ArtistLastname ,
Artworks.Artmedium AS ArtMedium,
Sales.Price AS Saleprice,
MediumAvgPrice.AvgSoldPrice
FROM Artworks
JOIN Sales ON Artworks.ArtworkID =
Sales.ArtworkID
JOIN Artists ON Artworks.ArtistID =
Artists.ArtistID
JOIN MediumAvgPrice ON
artworks.ArtMedium =
MediumAvgPrice.ArtMedium
ORDER BY
MediumAvgPrice.AvgSoldPrice DESC,
Sales.Price DESC
LIMIT 3;
```

Output

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

Article	ArtistFirstname	ArtistLastname	ArtMedium	Saleprice	AvgSoldPrice
▶ The Depths	Michael	Wilson	Installation	20000.00	20000.000000
▢ Sculpture of Hope	Jane	Smith	Sculpture	4500.00	4500.000000
▢ Abstract Reflections	Aiden	Hall	Acrylic	3500.00	2500.000000

- **To analyze the sales performance of artworks grouped by artist nationality, providing insights into the volume of artworks sold, total revenue generated, and average price per artwork.**

Key Insights:

- **Top Sold Artworks:** Identifies the top 3 sold artworks, along with their titles and associated artist details (first and last name).
- **Medium Comparison:** Compares each artwork's sale price with the average sold price for the same medium, highlighting variations in value.
- **Performance Analysis:** Provides insights into high-value artworks and trends in artist performance within specific art mediums.

Query Code	<pre> SELECT a.Nationality AS ArtistNationality, COUNT(aw.ArtworkID) AS TotalArtworks, SUM(aw.Price) AS TotalSales, AVG(aw.Price) AS AvgPrice FROM Artists a JOIN Artworks aw ON a.ArtistID = aw.ArtistID WHERE aw.ArtStatus = 'sold' GROUP BY ArtistNationality ORDER BY TotalSales DESC; </pre>
------------	---

Output

ArtistNational...	TotalArtwor...	TotalSales	AvgPrice	
British	2	5100.00	2550.000000	
Mexican	1	1100.00	1100.000000	
		</		

- To rank artworks within each medium by the year they were created, providing a timeline of the evolution and trends in artistic styles.

Key Insights:

- **Artwork Ranking:** Ranks artworks within each medium based on the year of creation, offering a chronological perspective.
- **Artistic Evolution:** Highlights the evolution of artistic styles and techniques within each medium over time.
- **Trend Analysis:** Provides insights into historical and contemporary trends in art, helping to understand shifts in creativity and preferences.

Query Code	<pre>SELECT aw.Title AS ArtworkTitle, aw.ArtMedium AS ArtMedium, aw.YearCreated, RANK() OVER (PARTITION BY aw.ArtMedium ORDER BY aw.YearCreated) AS YearRank FROM Artworks aw ORDER BY ArtMedium, aw.YearCreated;</pre>
------------	---

Output

ArtworkTitle	ArtMedium	YearCreated	YearRank
Abstract Reflections	Acrylic	2020	1
Nature's Canvas	Acrylic	2021	2
Minimalism	Canvas	2019	1
Ceramic Elegance	Ceramics	2022	1
Digital Horizon	Digital Art	2023	1
Echoes	Digital Installation	2021	1
The Depths	Installation	2018	1
Fusion	Mixed Media	2022	1
Light and Shadow	Mixed Media	2022	1
Vibrant Streets	Mural	2021	1
Abstract Dreams	Oil Painting	2020	1
Landscapes of Time	Oil Painting	2020	1
Journey	Oil Painting	2023	3
Pastel Dreams	Pastel	2021	1
Nature's Symphony	Photography	2019	1
Ethereal Light	Photography	2020	2

- To identify and evaluate collaborative artist pairs from the same nationality who have worked together on multiple artworks, providing insights into their collaboration frequency and the financial impact of their combined efforts.

Key Insights:

- **Collaboration Frequency:** Identifies collaborative artist pairs from the same nationality who have worked together on multiple artworks, highlighting the most frequent partnerships.
- **Financial Impact:** Evaluates the financial outcomes of these collaborations by analyzing the total revenue generated from their joint artworks.
- **Collaboration Trends:** Provides insights into successful artist pairings and the role of shared nationality in fostering artistic collaboration.

Query Code

```
WITH ArtistPairs AS (
  SELECT
    a1.ArtistID AS Artist1ID,
    a2.ArtistID AS Artist2ID,
    a1.Nationality,
    CONCAT(a1.FirstName, ' ',
a1.LastName) AS Artist1Name,
    CONCAT(a2.FirstName, ' ',
a2.LastName) AS Artist2Name
  FROM Artists a1
  JOIN Artists a2 ON a1.ArtistID <
a2.ArtistID
```

```

WHERE a1.Nationality = a2.Nationality
),
CollaborativeArtworks AS (
  SELECT
    ap.Artist1ID,
    ap.Artist2ID,
    ap.Nationality,
    ap.Artist1Name,
    ap.Artist2Name,
    aw.ArtworkID,
    aw.Price
  FROM ArtistPairs ap
  JOIN Artworks aw ON aw.ArtistID =
    ap.Artist1ID OR aw.ArtistID = ap.Artist2ID
  GROUP BY ap.Artist1ID, ap.Artist2ID,
    ap.Nationality, ap.Artist1Name,
    ap.Artist2Name, aw.ArtworkID, aw.Price
),
CollaborationSummary AS (
  SELECT
    Artist1ID,
    Artist2ID,
    Nationality,
    Artist1Name,
    Artist2Name,
    COUNT(DISTINCT ArtworkID) AS
CollaborationCount,
    SUM(Price) AS
TotalCollaborationValue
  FROM CollaborativeArtworks
  GROUP BY Artist1ID, Artist2ID,
    Nationality, Artist1Name, Artist2Name
)
SELECT
  Nationality,
  Artist1Name,
  Artist2Name,
  CollaborationCount,
  TotalCollaborationValue
FROM CollaborationSummary
WHERE CollaborationCount >= 2
ORDER BY Nationality,
  CollaborationCount DESC,
  TotalCollaborationValue DESC;

```


Output

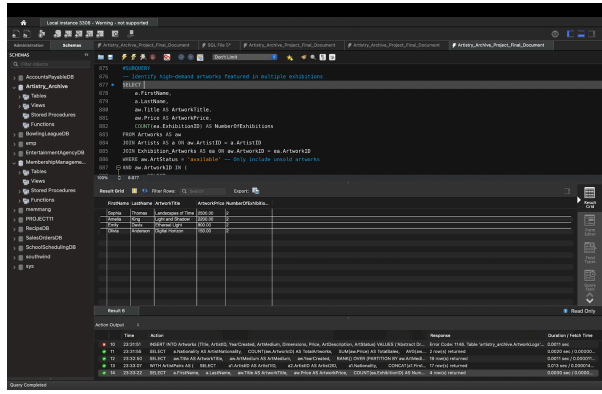
Nationality	Artist1Name	Artist2Name	CollaborationCou...	TotalCollaborationVal...
American	John Doe	Alexander Wright	2	2600.00
American	Emily Davis	Alexander Wright	2	2200.00
American	Ethan Lewis	Alexander Wright	2	2100.00
American	John Doe	Emily Davis	2	2000.00
American	John Doe	Ethan Lewis	2	1900.00
American	Olivia Anderson	Alexander Wright	2	1550.00
American	Emily Davis	Ethan Lewis	2	1500.00
American	John Doe	Olivia Anderson	2	1350.00
American	Emily Davis	Olivia Anderson	2	950.00
American	Olivia Anderson	Ethan Lewis	2	850.00
Australian	Bob Brown	Aiden Hall	2	4300.00
British	Jane Smith	Isabella Walker	2	8000.00
British	Jane Smith	Noah Taylor	2	5100.00
British	Noah Taylor	Isabella Walker	2	4100.00
Mexican	Emma Garcia	James Young	2	1100.00
New Zea...	Michael Wilson	Charlotte Allen	2	21000.00

SUBQUERY

Key Insights:

The subquery and main query provided aim to identify artworks by artists whose pieces have appeared in multiple exhibitions, with insights into their details and associated exhibition counts. Below is an explanation of the query logic and how it aligns with the task:

Query Code	<pre> SELECT a.FirstName, a.LastName, aw.Title AS ArtworkTitle, aw.Price AS ArtworkPrice, COUNT(ea.ExhibitionID) AS NumberOfExhibitions FROM Artworks AS aw JOIN Artists AS a ON aw.ArtistID = a.ArtistID JOIN Exhibition_Artworks AS ea ON aw.ArtworkID = ea.ArtworkID WHERE aw.ArtStatus = 'available' -- Only include unsold artworks AND aw.ArtworkID IN (SELECT ea2.ArtworkID FROM Exhibition_Artworks AS ea2 GROUP BY ea2.ArtworkID </pre>
------------	---

	HAVING COUNT(ea2.ExhibitionID) > 1 -- Artworks must have appeared in more than one exhibition) GROUP BY a.ArtistID, aw.ArtworkID ORDER BY NumberOfExhibitions DESC, ArtworkPrice DESC; ;
Output	 <p>The screenshot shows a SQL query execution interface. The query is as follows:</p> <pre> SELECT a.ArtistID, a.LastName, a.FirstName, aw.ArtworkID, aw.Price AS ArtworkPrice, COUNT(ea2.ExhibitionID) AS NumberOfExhibitions FROM Artists a JOIN Artworks aw ON a.ArtistID = aw.ArtistID JOIN Exhibitions ea2 ON aw.ArtworkID = ea2.ArtworkID GROUP BY a.ArtistID, aw.ArtworkID HAVING COUNT(ea2.ExhibitionID) > 1 ORDER BY NumberOfExhibitions DESC, ArtworkPrice DESC; </pre> <p>The results are displayed in a table with the following columns: ArtistID, LastName, FirstName, ArtworkID, ArtworkPrice, and NumberOfExhibitions. The table shows data for artists and their artworks, grouped by artist and artwork, and ordered by the number of exhibitions in descending order, and then by artwork price in descending order.</p>

- To generate a comprehensive sales performance report for artists, grouped by nationality, that includes each artist's total sales, average sale price, and summarized data at nationality and overall levels.

Key Insights:

- **Individual Artist Performance:** Analyzes each artist's total sales and average sale price, providing a detailed view of their sales performance within their nationality group.
- **Nationality-Level Summary:** Summarizes sales data by nationality, showcasing collective performance metrics and identifying high-performing groups.
- **Overall Insights:** Provides an overarching analysis of sales trends, combining nationality-level and individual artist data for a comprehensive performance report.

Stored Procedures

- **Procedure1**

- This procedure retrieves detailed artwork records filtered by artist ID, status, and price range, and orders them by year created (descending) and price (ascending).

Procedure Code:	<pre>DELIMITER // CREATE PROCEDURE GetArtworksDetails(IN p_ArtistID INT, IN p_Status ENUM('available', 'sold', 'on display'), IN p_MinPrice DECIMAL(10, 2), IN p_MaxPrice DECIMAL(10, 2)) BEGIN SELECT ArtworkID, Title, YearCreated, ArtMedium, Dimensions, Price, ArtStatus FROM Artworks WHERE ArtistID = p_ArtistID AND ArtStatus = p_Status AND Price BETWEEN p_MinPrice AND p_MaxPrice ORDER BY YearCreated DESC, Price ASC; END // DELIMITER ;</pre>
After Calling Procedure (Result with data matching each order with discount applied):	ArtworkID, Title, YearCreated, ArtMedium, Dimensions, Price, ArtStatus

CALL GetArtworksDetails(1, 'available', 800.00, 1200.00);	Abstract Dreams 2020 Oil Painting 24x36 inches 1200.00 available
---	--

- **Procedure2**

- This procedure retrieves restoration records from the RestorationRecords table for the types 'Repainting' and 'Structural', completed in 2023, and performed by specific restorers ('Emma Roberts', 'Carlos Sanchez', 'Sara El-Amin'), ordered by restoration date and cost.

Procedure Code:	<pre> DELIMITER // CREATE PROCEDURE GetRestorationDetails() BEGIN -- Select restoration records for the 'Repainting' type, with specific conditions SELECT RestorationID, RestorationDate, RestorationDescription, RestorerName, Cost, RestorationType, RestorationLocation, RestorationCompany FROM RestorationRecords WHERE RestorationType IN ('Repainting', 'Structural') -- Fixed restoration types AND YEAR(RestorationDate) = 2023 -- Fixed year filter for 2023 AND RestorerName IN ('Emma Roberts', 'Carlos Sanchez', 'Sara El-Amin') -- Specific restorers ORDER BY RestorationDate DESC, Cost ASC; -- Sorting results END // DELIMITER ; </pre>
After Calling Procedure call GetRestorationDetails;	RestorationID, RestorationDate, RestorationDescription,

	RestorerName, Cost, RestorationType, RestorationLocation, RestorationCompany 1 2023-02-10 Restoration of surface cracks and structural reinforcement Emma Roberts 4500.00 Structural New York Conservation Center NY Restoration Inc. 6 2023-01-12 Repainting to restore original colors Sara El-Amin 3000.00 Repainting Louvre Restoration Lab Paris Art Experts
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- **Procedure3:**

- The procedure retrieves exhibition details for specific venues (e.g., 'Art Gallery One', 'Nature Center', 'City Art Space'), with atleast 1 associated artworks, and orders the results by the exhibition start date in descending order.

Procedure Code:	<pre> DELIMITER // CREATE PROCEDURE GetExhibitionsByVenueAndArtworkCount() BEGIN -- Select exhibition details and the count of artworks for each exhibition SELECT e.ExhibitionID, e.ExhibitionName, e.StartDate, e.EndDate, e.Venue, e.ArtDescription, COUNT(ea.ArtworkID) AS ArtworkCount FROM Exhibitions e JOIN Exhibition_Artworks ea ON e.ExhibitionID = ea.ExhibitionID WHERE e.Venue IN ('Art Gallery One', 'Nature Center', 'City Art Space') -- Filter by specific venues GROUP BY e.ExhibitionID HAVING COUNT(ea.ArtworkID) >= 1 -- Only exhibitions with more than 4 </pre>
-----------------	---

	artworks ORDER BY e.StartDate DESC; -- Sort by start date in descending order END // DELIMITER ;
After Calling Procedure : call GetExhibitionsByVenueAndArtworkCount;	ExhibitionID, ExhibitionName, StartDate, EndDate, Venue, ArtDescription, ArtworkCount 3 Urban Expressions 2023-07-05 2023-09-05 City Art Space Art inspired by urban life. 1 2 Nature in Focus 2023-04-10 2023-06-10 Nature Center Capturing the essence of nature through art. 1 1 Contemporary Visions 2023-01-15 2023-03-15 Art Gallery One An exhibition showcasing modern art. 1

Stored Functions

- **GetArtistFullName:**

- **Purpose:** Retrieves the full name of an artist by combining their first and last names.
- **Input Parameter:** `artistID` (ID of the artist).
- **Output:** A string containing the full name of the artist.
- **Use Case:** It allows users to quickly fetch the full name of an artist given their ID, useful for profile displays or reports.

Function Code	<pre>DELIMITER // CREATE FUNCTION GetArtistFullName(artistID INT) RETURNS VARCHAR(255) DETERMINISTIC BEGIN DECLARE fullName VARCHAR(255); SELECT CONCAT(FirstName, ' ', LastName) INTO fullName FROM Artists WHERE ArtistID = artistID; RETURN fullName; END; // DELIMITER ;</pre>
Example	<pre>SELECT GetArtistFullName(1) AS FullName;</pre>
Output	<pre># FullName John Doe</pre>

- **GetTotalArtworks:**

- **Purpose:** This function calculates the total number of artworks created by an artist.
- **Input Parameter:** `artistID` (Artist ID)
- **Output:** The total count of artworks associated with the artist.
- **Use Case:** This helps to track the artist's productivity or the extent of their contributions to the art archive.

Function Code	<pre> DELIMITER // CREATE FUNCTION GetTotalArtworks(artistID INT) RETURNS INT DETERMINISTIC BEGIN DECLARE totalArtworks INT; -- Count the number of artworks by the artist SELECT COUNT(*) INTO totalArtworks FROM Artworks WHERE ArtistID = artistID; -- Return the total number of artworks RETURN totalArtworks; END; // DELIMITER ; </pre>
Example	<pre> SELECT GetTotalArtworks(1) AS TotalArtworks; </pre>
Output	<pre> #TotalArtworks 25 </pre>

- **GetArtistNationality:**

- **Purpose:** This function retrieves the nationality of the artist based on their Artist ID.
- **Input Parameter:** `artistID` (Artist ID)
- **Output:** The nationality of the artist.
- **Use Case:** This is useful for sorting, filtering, or analyzing the diversity of artists in the archive.

Function Code	<pre> DELIMITER // CREATE FUNCTION GetArtistNationality(artistID INT) RETURNS VARCHAR(100) DETERMINISTIC BEGIN </pre>
---------------	--

	<pre> DECLARE nationality VARCHAR(100); -- Retrieve the artist's nationality SELECT Nationality INTO nationality FROM Artists WHERE ArtistID = artistID; -- Return the nationality RETURN nationality; END; // DELIMITER ; </pre>
Example	<pre> SELECT GetArtistNationality(1) AS Nationality; </pre>
Output	<pre> # Nationality American </pre>

- **IsArtworkAvailable**

- **Purpose:** This function checks if an artwork is available (i.e., not present in any ongoing exhibition).
- **Input Parameter:**
artworkID (Artwork ID)
- **Output:** A boolean indicates the availability of the artwork. Returns **TRUE** if not part of any exhibition (indicating availability), **FALSE** otherwise.
- **Use Case:** This function helps determine whether an artwork is currently displayed or available for other exhibitions or sales.

Function Code	<pre> DELIMITER // CREATE FUNCTION IsArtworkAvailable(artworkID INT) RETURNS BOOLEAN DETERMINISTIC BEGIN DECLARE isAvailable BOOLEAN; -- Check if the artwork is in any exhibition SELECT COUNT(*) INTO isAvailable FROM Exhibition_Artworks WHERE ArtworkID = artworkID; </pre>
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	<pre>-- Return TRUE if the artwork is available (not in any exhibition) RETURN isAvailable = 0; END; // DELIMITER ;</pre>
Example	<pre>SELECT IsArtworkAvailable(101) AS Availability;</pre>
Output	<pre># Availability TRUE</pre>

- **GetArtistEmail:**

- **Purpose:** This function retrieves the contact email of the artist based on their Artist ID.
- **Input Parameter:** `artistID` (Artist ID)
- **Output:** The email address of the artist.
- **Use Case:** This can be used to contact the artist or for communication purposes, such as event invitations or inquiries.

Function Code	<pre>DELIMITER // CREATE FUNCTION GetArtistEmail(artistID INT) RETURNS VARCHAR(255) DETERMINISTIC BEGIN DECLARE email VARCHAR(255); -- Retrieve the artist's contact email SELECT ContactInfo INTO email FROM Artists WHERE ArtistID = artistID; -- Return the email address RETURN email; END; //</pre>
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	DELIMITER ;
Example	SELECT GetArtistEmail(1) AS Email;
Output	# Email johndoe@email.com

Stored Triggers

- **Trigger1**

- Trigger 1: Before Insert - Validate artwork title length and creation year

Trigger Code	<pre>DELIMITER // CREATE TRIGGER before_artwork_insert BEFORE INSERT ON Artworks FOR EACH ROW BEGIN IF LENGTH(NEW.Title) > 100 THEN SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'Artwork title is too long.'; END IF; IF NEW.YearCreated > YEAR(CURDATE()) THEN SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'Year created cannot be in the future.'; END IF; END //</pre>
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- **Trigger2**

- Trigger 2: After Insert - Log new artwork addition

Trigger Code	<pre>DELIMITER // CREATE TRIGGER after_artwork_insert AFTER INSERT ON Artworks FOR EACH ROW BEGIN INSERT INTO ArtworkLogs (ArtworkID, Action, ActionDate) VALUES (NEW.ArtworkID, 'INSERT', NOW()); END //</pre>
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- **Trigger3**

- Trigger 3: Before Update - Capture current state for reference

Trigger Code	<pre> DELIMITER // CREATE TRIGGER before_artwork_update BEFORE UPDATE ON Artworks FOR EACH ROW BEGIN INSERT INTO ArtworkHistory (ArtworkID, OldTitle, OldYearCreated, UpdatedDate) VALUES (OLD.ArtworkID, OLD.Title, OLD.YearCreated, NOW()); END // </pre>
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- **Trigger4**

- Trigger 4: After Update - Log the update action

Trigger Code	<pre> DELIMITER // CREATE TRIGGER after_artwork_update AFTER UPDATE ON Artworks FOR EACH ROW BEGIN INSERT INTO ArtworkLogs (ArtworkID, Action, ActionDate) VALUES (NEW.ArtworkID, 'UPDATE', NOW()); END // </pre>
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- **Trigger 5**

- Trigger 5: Before Delete - Archive artwork details

Trigger Code	<pre> DELIMITER // CREATE TRIGGER before_artwork_delete BEFORE DELETE ON Artworks FOR EACH ROW BEGIN </pre>
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	<pre> INSERT INTO ArchivedArtworks (ArtworkID, Title, YearCreated, ArchivedDate) VALUES (OLD.ArtworkID, OLD.Title, OLD.YearCreated, NOW()); END // DELIMITER //</pre>
--	---

- **Trigger6**

- Trigger 6: After Delete - Log deletion action

Trigger Code	<pre> CREATE TRIGGER after_artwork_delete AFTER DELETE ON Artworks FOR EACH ROW BEGIN INSERT INTO ArtworkLogs (ArtworkID, Action, ActionDate) VALUES (OLD.ArtworkID, 'DELETE', NOW()); END // -- Reset delimiter back to default DELIMITER ;</pre>
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Conclusion

The **Artistry Archive** database management system provides a sophisticated and reliable solution for art galleries and institutions to manage their collections, artists, exhibitions, and sales. By focusing on data integrity, scalability, and security, the system lays the foundation for future expansion and integration with UI and logical layers.

The design of the database ensures that it can scale with the needs of a growing collection, while its flexible structure supports easy adaptation to future technologies and functionalities. This system will significantly improve operational efficiency, data accessibility, and decision-making processes within art institutions.

Video

video for the project: **Artistry Archive**

https://youtu.be/6BE_hr4RspU