

Practical Assignment – Evidence Report & Export

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Module: Database Intermediate (DATA6222)

Assignment: Practical Database Assignment 1

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Step 1 – Create Database and Tables

-- Step 1: Create Database

```
CREATE DATABASE ArtGalleryDB;
```

```
USE ArtGalleryDB;
```

-- Create Artist table

```
CREATE TABLE Artist (  
    ArtistID INT PRIMARY KEY,  
    FirstName VARCHAR(50) NOT NULL,  
    LastName VARCHAR(50) NOT NULL  
);
```

-- Create Genre table

```
CREATE TABLE Genre (  
    GenreID INT PRIMARY KEY,  
    Description VARCHAR(100) NOT NULL  
);
```

-- Create Artwork table

```
CREATE TABLE Artwork (  
    ArtworkID INT PRIMARY KEY,  
    Title VARCHAR(100) NOT NULL,  
    ArtistID INT NOT NULL,  
    GenreID INT NOT NULL,  
    FOREIGN KEY (ArtistID) REFERENCES Artist(ArtistID),  
    FOREIGN KEY (GenreID) REFERENCES Genre(GenreID)  
);
```

-- Create Exhibition table

CREATE TABLE Exhibition (

ExhibitionID INT PRIMARY KEY,

Description VARCHAR(100) NOT NULL

);

-- Create Artwork_Exhibition junction table (many-to-many)

CREATE TABLE Artwork_Exhibition (

ArtworkID INT NOT NULL,

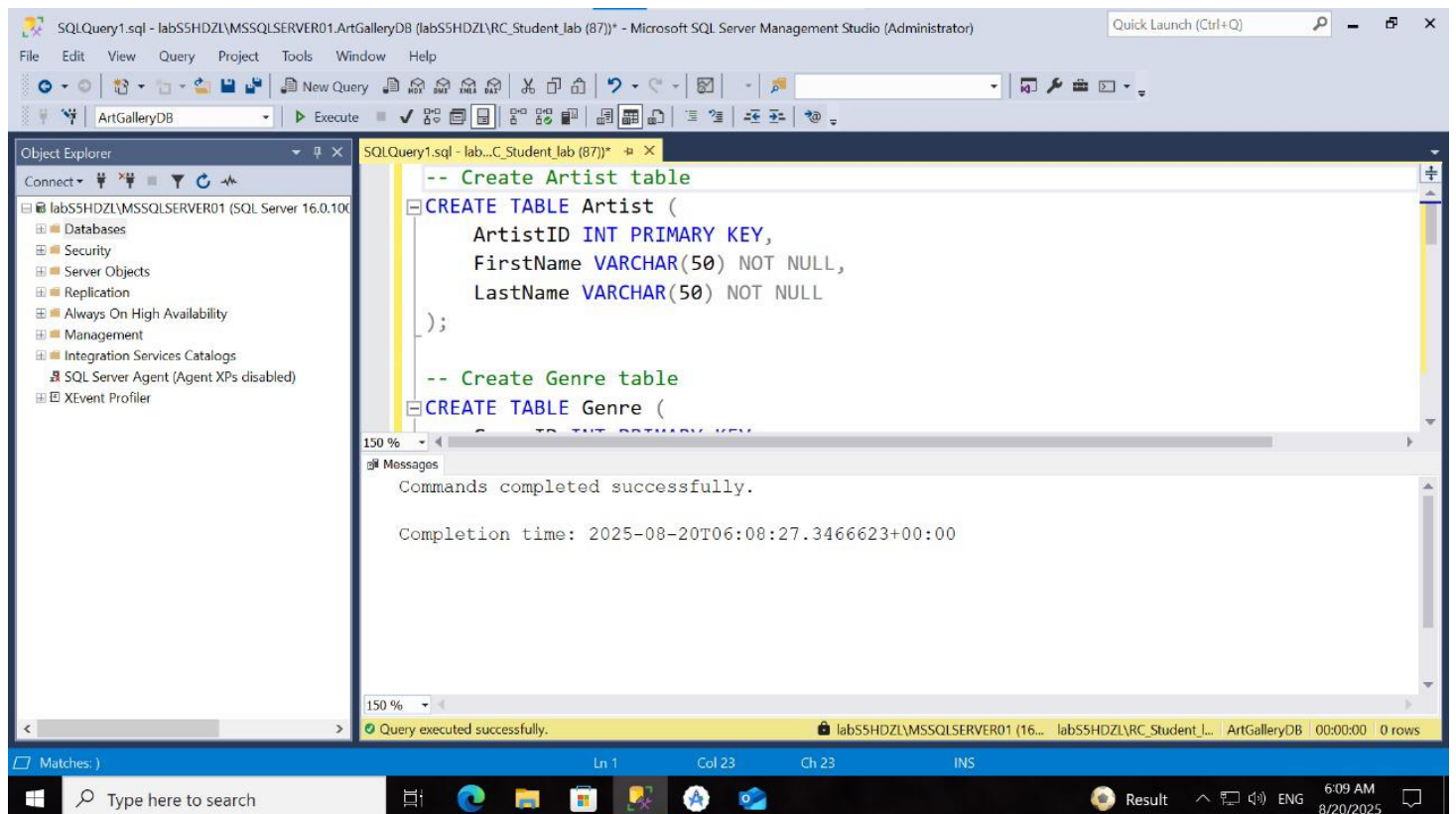
ExhibitionID INT NOT NULL,

PRIMARY KEY (ArtworkID, ExhibitionID),

FOREIGN KEY (ArtworkID) REFERENCES Artwork(ArtworkID),

FOREIGN KEY (ExhibitionID) REFERENCES Exhibition(ExhibitionID)

);



Verification Of Step 1: I ran the script to test and all tables were generated with the appropriate PKs and FKs.

Step 2 – Insert Data

-- Insert Artists

```
INSERT INTO Artist VALUES (1, 'Makhadzi', 'Mambani');
```

```
INSERT INTO Artist VALUES (2, 'Lufuno', 'Mabirimisa');
```

```
INSERT INTO Artist VALUES (3, 'Tshilidzi', 'Mulaudzi');
```

```
INSERT INTO Artist VALUES (4, 'Mvelelo', 'Mshabi');
```

```
INSERT INTO Artist VALUES (5, 'Omphah', 'Mudau');
```

-- Insert Genres

```
INSERT INTO Genre VALUES (1, 'Abstract');
```

```
INSERT INTO Genre VALUES (2, 'Realism');
```

```
INSERT INTO Genre VALUES (3, 'Surrealism');
```

-- Insert Artworks (20 records)

```
INSERT INTO Artwork VALUES (1, 'Harmony in Motion', 1, 1);
```

```
INSERT INTO Artwork VALUES (2, 'Rhythms of Life', 1, 1);
```

```
INSERT INTO Artwork VALUES (3, 'Golden Sunrise', 2, 2);
```

```
INSERT INTO Artwork VALUES (4, 'Shadows and Light', 2, 2);
```

```
INSERT INTO Artwork VALUES (5, 'Whispers of Nature', 2, 2);
```

```
INSERT INTO Artwork VALUES (6, 'Portrait of Hope', 3, 3);
```

```
INSERT INTO Artwork VALUES (7, 'Silent Dreams', 3, 3);
```

```
INSERT INTO Artwork VALUES (8, 'Timeless Journey', 3, 3);
```

```
INSERT INTO Artwork VALUES (9, 'Unity of Cultures', 4, 1);
```

```
INSERT INTO Artwork VALUES (10, 'Echoes of the Past', 4, 1);
```

INSERT INTO Artwork VALUES (11, 'Breaking Boundaries', 5, 2);
INSERT INTO Artwork VALUES (12, 'Mind's Reflection', 5, 2);
INSERT INTO Artwork VALUES (13, 'Colors of Memory', 5, 2);
INSERT INTO Artwork VALUES (14, 'Cultural Tapestry', 5, 2);
INSERT INTO Artwork VALUES (15, 'Dreamscapes', 5, 3);
INSERT INTO Artwork VALUES (16, 'Path of Wisdom', 1, 1);
INSERT INTO Artwork VALUES (17, 'Circle of Harmony', 1, 1);
INSERT INTO Artwork VALUES (18, 'Silent Forest', 2, 2);
INSERT INTO Artwork VALUES (19, 'Light Within', 3, 3);
INSERT INTO Artwork VALUES (20, 'Rising Spirit', 4, 1);

-- Insert Exhibitions (15 records)

INSERT INTO Exhibition VALUES (1, 'Voices of Africa');
INSERT INTO Exhibition VALUES (2, 'Realism Revealed');
INSERT INTO Exhibition VALUES (3, 'Dream Beyond Reality');
INSERT INTO Exhibition VALUES (4, 'Youthful Expressions');
INSERT INTO Exhibition VALUES (5, 'Art for Change');
INSERT INTO Exhibition VALUES (6, 'Reflections of Identity');
INSERT INTO Exhibition VALUES (7, 'Journey Through Time');
INSERT INTO Exhibition VALUES (8, 'Colors of Diversity');
INSERT INTO Exhibition VALUES (9, 'Abstract Inspirations');
INSERT INTO Exhibition VALUES (10, 'Silent Stories');
INSERT INTO Exhibition VALUES (11, 'Shaping the Future');
INSERT INTO Exhibition VALUES (12, 'Visions of Freedom');
INSERT INTO Exhibition VALUES (13, 'Echoes of Tradition');
INSERT INTO Exhibition VALUES (14, 'Unity in Art');

INSERT INTO Exhibition VALUES (15, 'Surrealist Journeys');

-- Insert Artwork_Exhibition relationships

INSERT INTO Artwork_Exhibition VALUES (1, 1);

INSERT INTO Artwork_Exhibition VALUES (1, 6); -- Artwork appears in 2 exhibitions

INSERT INTO Artwork_Exhibition VALUES (3, 2);

INSERT INTO Artwork_Exhibition VALUES (4, 2);

INSERT INTO Artwork_Exhibition VALUES (6, 3);

INSERT INTO Artwork_Exhibition VALUES (7, 3);

INSERT INTO Artwork_Exhibition VALUES (9, 5);

INSERT INTO Artwork_Exhibition VALUES (10, 5);

INSERT INTO Artwork_Exhibition VALUES (11, 4);

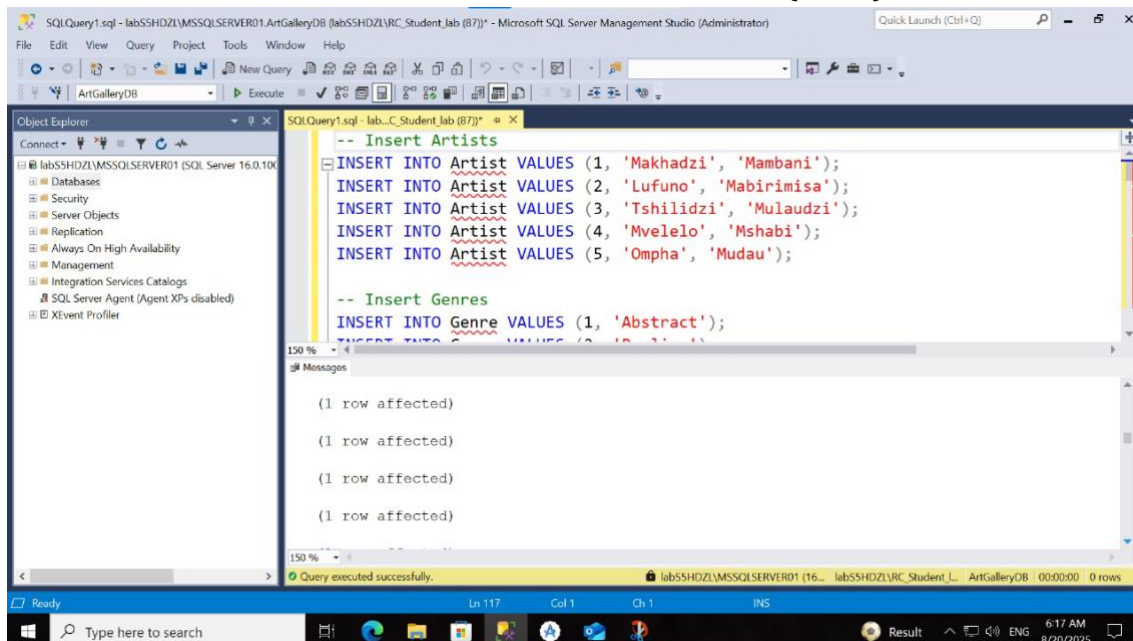
INSERT INTO Artwork_Exhibition VALUES (12, 4);

INSERT INTO Artwork_Exhibition VALUES (13, 4);

INSERT INTO Artwork_Exhibition VALUES (18, 2);

INSERT INTO Artwork_Exhibition VALUES (19, 3);

INSERT INTO Artwork_Exhibition VALUES (20, 5);



Verification Of Step 2 : Inserts were tested using SELECT * FROM..., and every entry populated accurately. All of the records appeared as intended when the inserts were run and each table was selected. The condition is met since at least one piece of art (Harmony in Motion) is connected to two shows.

Step 3: UPDATE STATEMENT

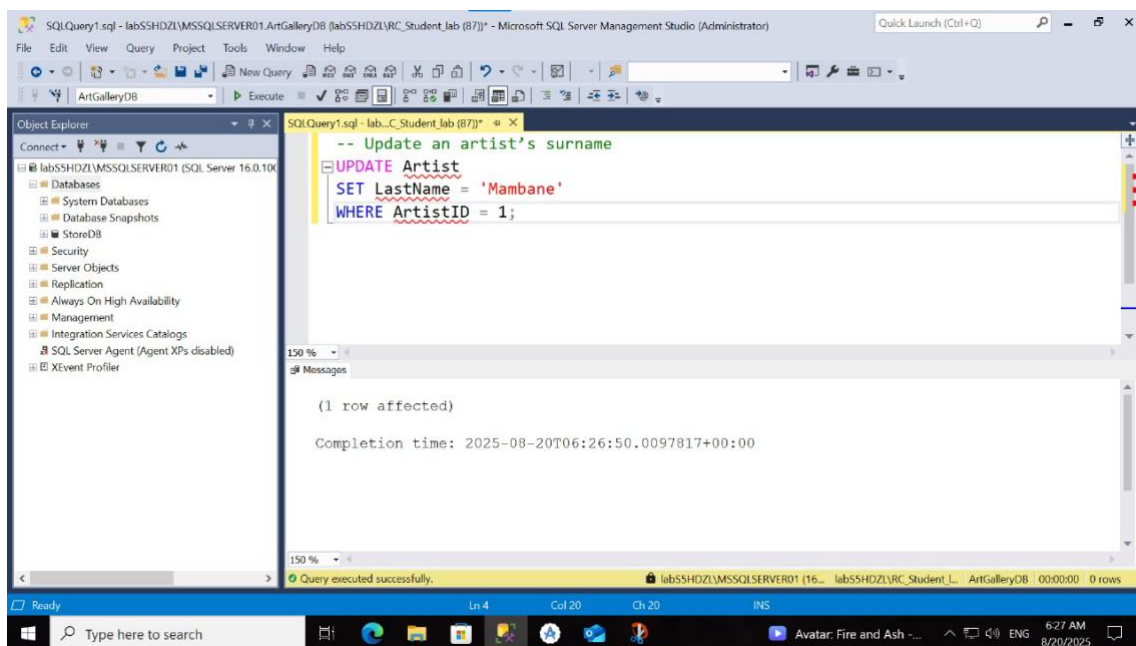
-- Update an artist's surname

UPDATE Artist

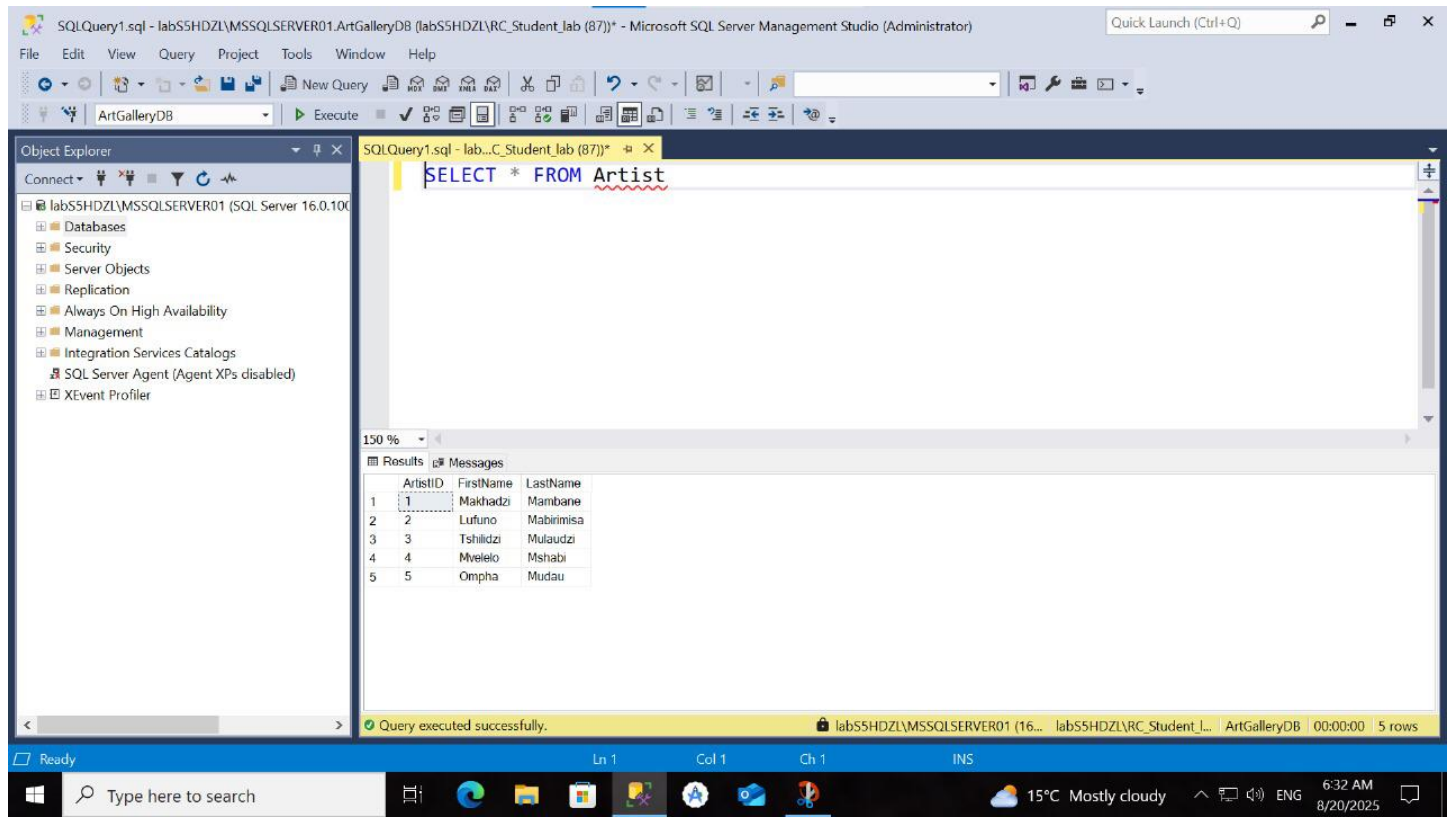
SET LastName = 'Mambane'

WHERE ArtistID = 1;

SQL EXECUTION



Output For Step 3 (SELECT from Artist shows surname updated from *Mambani* → *Mambane*.)



The screenshot displays the Microsoft SQL Server Management Studio interface. The query editor shows the command `SELECT * FROM Artist`. The Results pane below the query editor displays the output of the query, which is a table with 5 rows and 3 columns: ArtistID, FirstName, and LastName. The first row shows ArtistID 1, FirstName Makhadzi, and LastName Mambane, indicating a successful update from Mambani to Mambane. The status bar at the bottom indicates the query was executed successfully, returning 5 rows.

ArtistID	FirstName	LastName
1	Makhadzi	Mambane
2	Lufuno	Mabirimisa
3	Tshildzi	Mulaudzi
4	Mvelele	Mshabi
5	Omphe	Mudau

Verification For Step 3: I used `SELECT * FROM Artist` for testing. Makhadzi's surname was successfully changed.

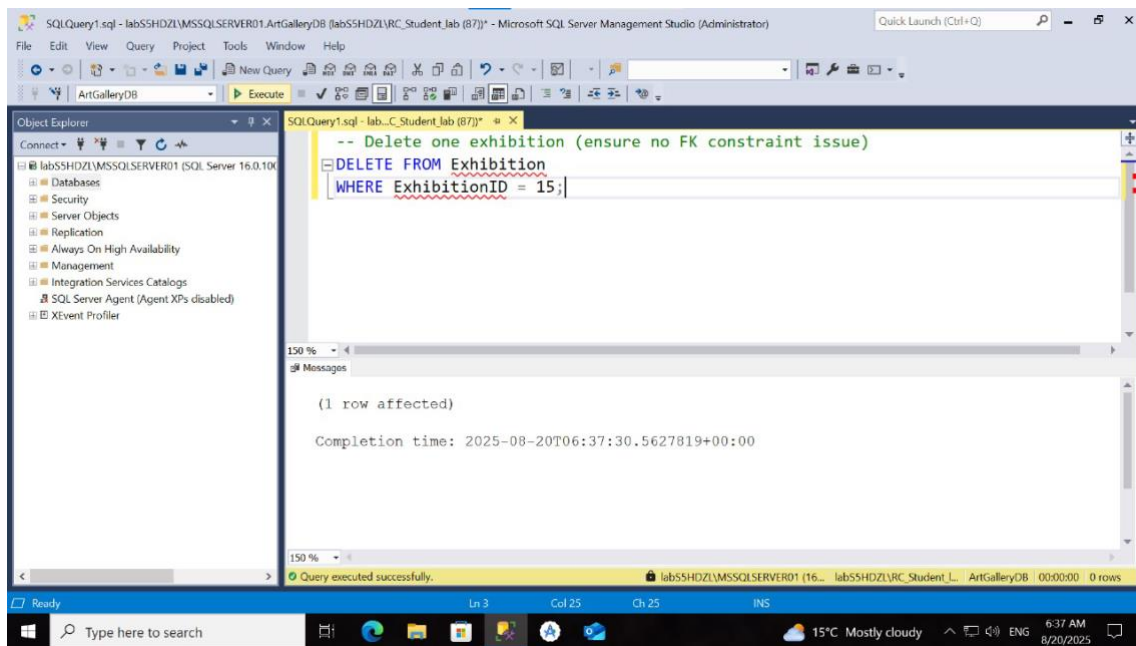
Step 4: DELETE STATEMENT

-- Delete one exhibition (ensure no FK constraint issue)

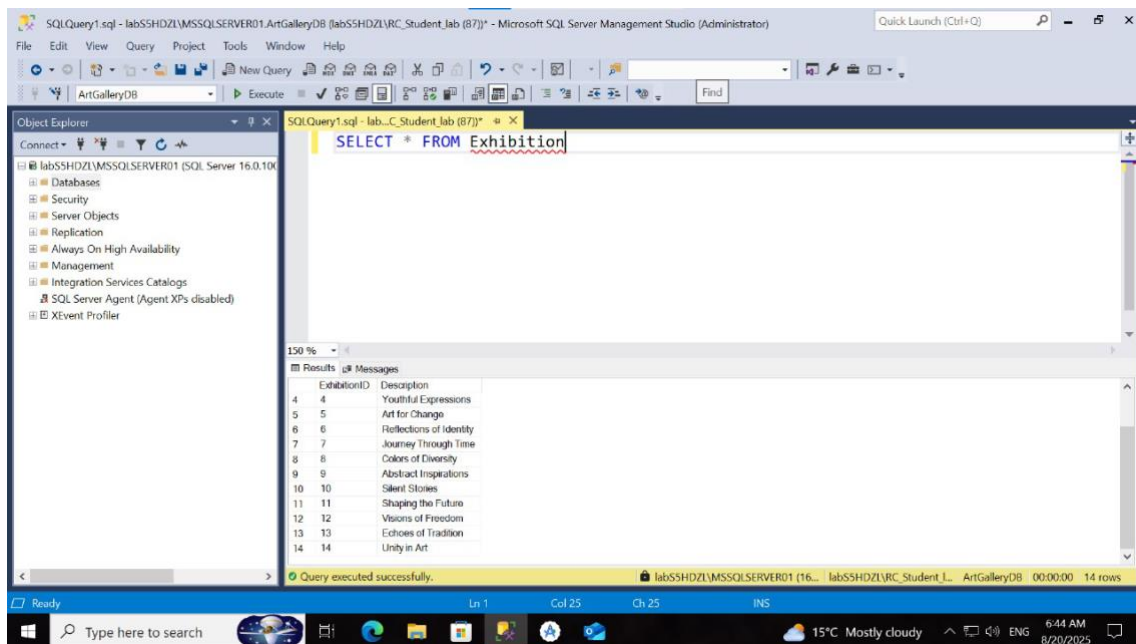
`DELETE FROM Exhibition`

`WHERE ExhibitionID = 15;`

SQL EXECUTION For Step 4



Output For Step 4(ExhibitionID = 15 (Surrealist Journeys) was eliminated, as indicated by the SELECT from Exhibition command.)



Verification For Step 4:

The record is no longer there, according to my test using SELECT * FROM Exhibition.

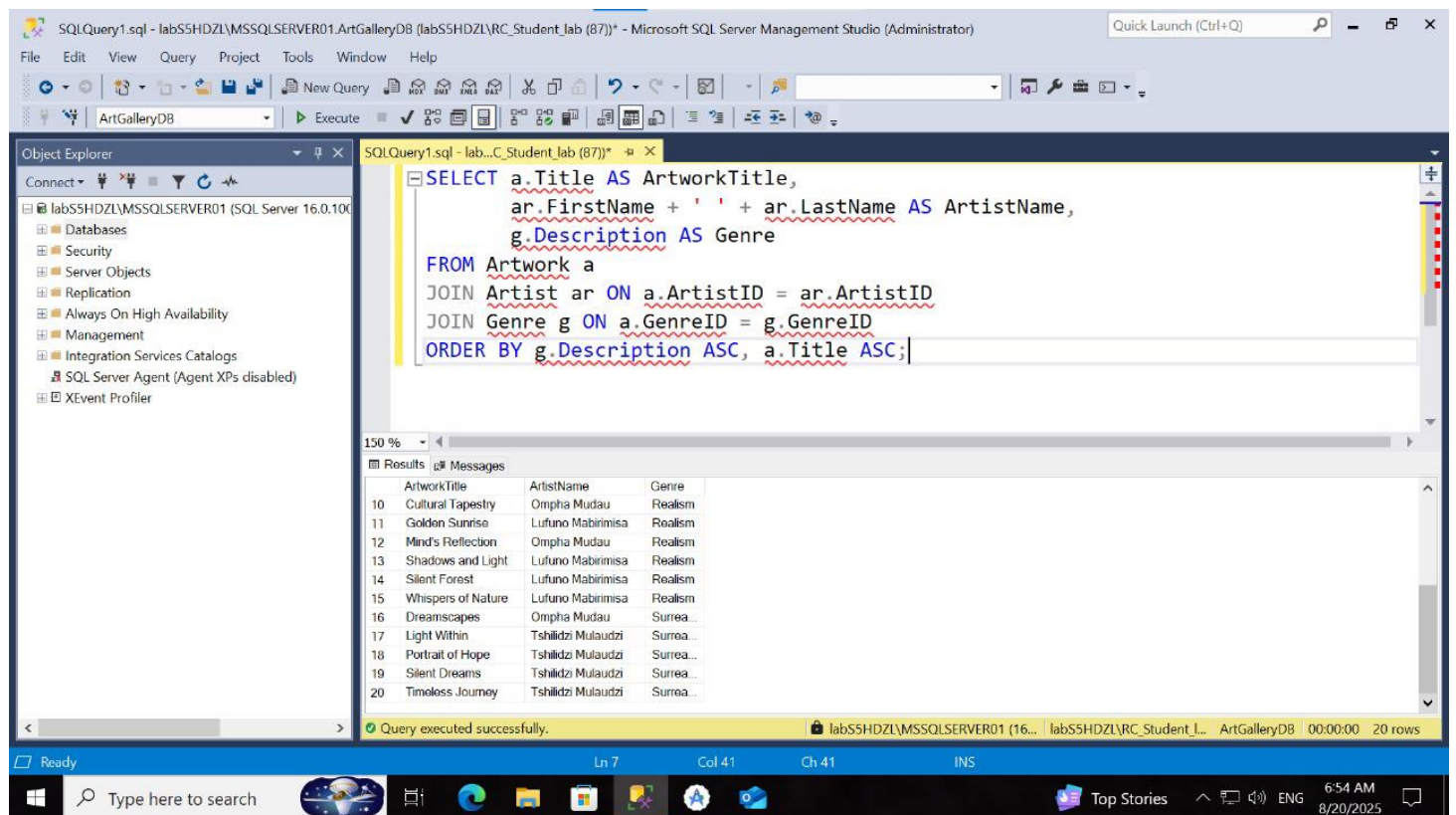
Step 5 – Report: Artwork Titles, Artists, and Genres (Sorted)

```
SELECT a.Title AS ArtworkTitle,  
       ar.FirstName + ' ' + ar.LastName AS ArtistName,  
       g.Description AS Genre  
FROM Artwork a  
JOIN Artist ar ON a.ArtistID = ar.ArtistID  
JOIN Genre g ON a.GenreID = g.GenreID  
ORDER BY g.Description ASC, a.Title ASC;
```

Step 5 Output

The screenshot displays the Microsoft SQL Server Management Studio (SSMS) interface. The main window shows a SQL query in the 'SQLQuery1.sql' file, which is the same query as provided in the previous block. The query is executed successfully, and the results are displayed in the 'Results' pane at the bottom. The results pane shows a table with three columns: 'ArtworkTitle', 'ArtistName', and 'Genre'. The table contains 12 rows of data, sorted by 'Genre' (ASC) and then 'ArtworkTitle' (ASC). The status bar at the bottom indicates that the query was executed successfully and returned 20 rows.

	ArtworkTitle	ArtistName	Genre
1	Circle of Harmony	Makhadzi Mambane	Abstract
2	Echoes of the Past	Mvelelo Mshabi	Abstract
3	Harmony in Motion	Makhadzi Mambane	Abstract
4	Path of Wisdom	Makhadzi Mambane	Abstract
5	Rhythms of Life	Makhadzi Mambane	Abstract
6	Rising Spirit	Mvelelo Mshabi	Abstract
7	Unity of Cultures	Mvelelo Mshabi	Abstract
8	Breaking Boundaries	Ompha Mudau	Realism
9	Colors of Memory	Ompha Mudau	Realism
10	Cultural Tapestry	Ompha Mudau	Realism
11	Golden Sunrise	Lufuno Mabimisa	Realism
12	Mind's Reflection	Ompha Mudau	Realism



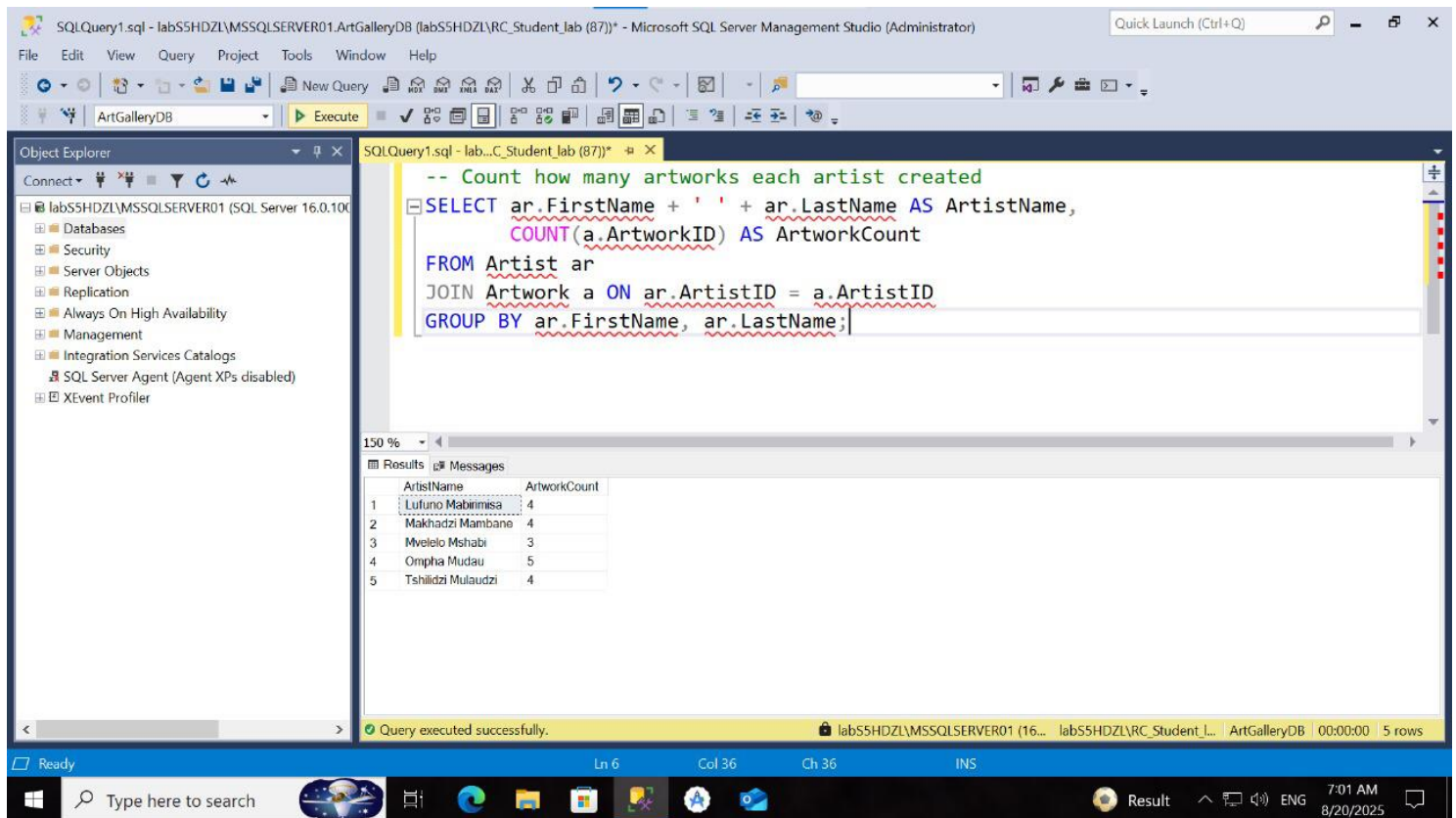
Verification For Step 5: Sorted by Genre and then Title, the report appeared as intended.

Step 6: GROUP BY Report

-- Count how many artworks each artist created

```
SELECT ar.FirstName + ' ' + ar.LastName AS ArtistName,
       COUNT(a.ArtworkID) AS ArtworkCount
FROM Artist ar
JOIN Artwork a ON ar.ArtistID = a.ArtistID
GROUP BY ar.FirstName, ar.LastName;
```

Output Of Step 6



The screenshot shows the Microsoft SQL Server Management Studio interface. The query editor displays the following SQL query:

```
-- Count how many artworks each artist created
SELECT ar.FirstName + ' ' + ar.LastName AS ArtistName,
       COUNT(a.ArtworkID) AS ArtworkCount
FROM Artist ar
JOIN Artwork a ON ar.ArtistID = a.ArtistID
GROUP BY ar.FirstName, ar.LastName;
```

The Results pane shows the output of the query:

ArtistName	ArtworkCount
Lufuno Makrimesa	4
Makhadzi Mambane	4
Mvelelo Mshabi	3
Omphah Mudau	5
Tshilidzi Mulaudzi	4

The status bar at the bottom indicates: "Query executed successfully. lab55HDZL\MSSQLSERVER01 (16... lab55HDZL\RC_Student_L... ArtGalleryDB 00:00:00 5 rows".

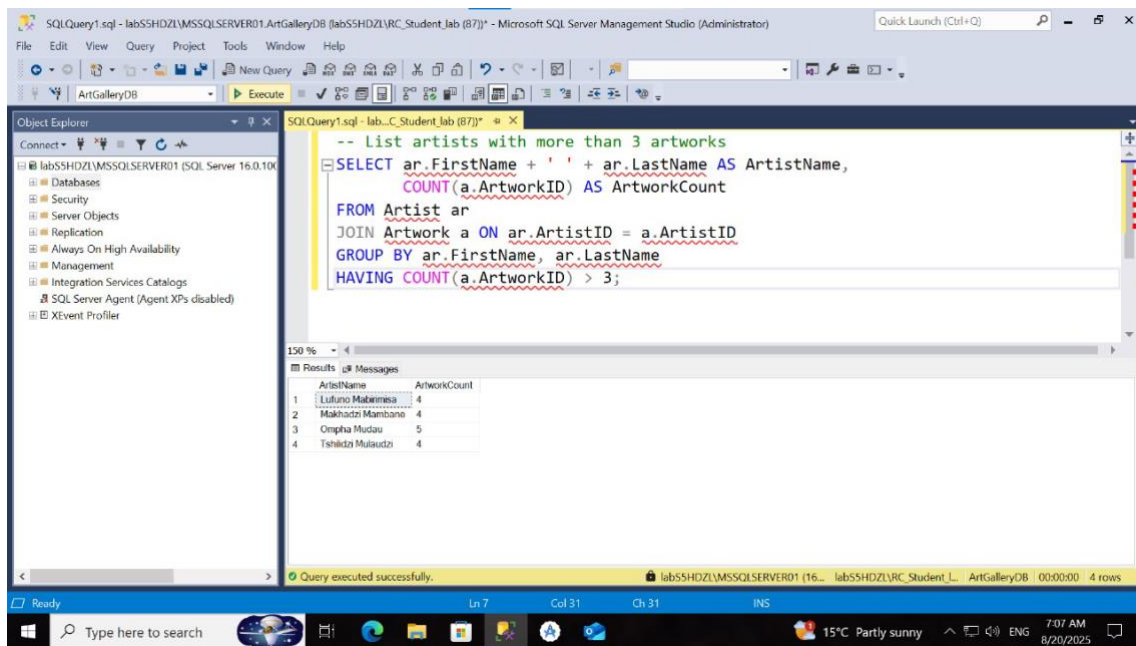
Purpose Of Report: displays the number of pieces of art that each artist has in the database.

Step 7 – HAVING Report

-- List artists with more than 3 artworks

```
SELECT ar.FirstName + ' ' + ar.LastName AS ArtistName,
       COUNT(a.ArtworkID) AS ArtworkCount
FROM Artist ar
JOIN Artwork a ON ar.ArtistID = a.ArtistID
GROUP BY ar.FirstName, ar.LastName
HAVING COUNT(a.ArtworkID) > 3;
```

Output Of Step 7:



Purpose Of Report: Only artists with more than three pieces of art are displayed after filtering the grouped results.

Step 8: JOIN Report

-- List artworks, their artists, genres, and exhibitions

SELECT a.Title AS ArtworkTitle,

ar.FirstName + ' ' + ar.LastName AS ArtistName,

g.Description AS Genre,

e.Description AS Exhibition

FROM Artwork a

JOIN Artist ar ON a.ArtistID = ar.ArtistID

JOIN Genre g ON a.GenreID = g.GenreID

JOIN Artwork_Exhibition ae ON a.ArtworkID = ae.ArtworkID

JOIN Exhibition e ON ae.ExhibitionID = e.ExhibitionID

ORDER BY g.Description ASC, a.Title ASC, e.Description ASC;

Output Of Step 8

The screenshot shows the Microsoft SQL Server Management Studio interface. The query editor contains the following SQL code:

```
SELECT ar.FirstName + ' ' + ar.LastName AS ArtistName,  
       g.Description AS Genre,  
       e.Description AS Exhibition  
FROM Artwork a  
JOIN Artist ar ON a.ArtistID = ar.ArtistID  
JOIN Genre g ON a.GenreID = g.GenreID  
JOIN Artwork_Exhibition ae ON a.ArtworkID = ae.ArtworkID  
JOIN Exhibition e ON ae.ExhibitionID = e.ExhibitionID  
ORDER BY g.Description ASC, a.Title ASC, e.Description ASC;
```

The Results pane displays the following data:

ArtworkTitle	ArtistName	Genre	Exhibition
Echoes of the Past	Mwelelo Mshabi	Abstract	Art for Change
Harmony in Motion	Makhadzi Mambano	Abstract	Reflections of Identity
Harmony in Motion	Makhadzi Mambano	Abstract	Voices of Africa
Rising Spirit	Mwelelo Mshabi	Abstract	Art for Change
Unity of Cultures	Mwelelo Mshabi	Abstract	Art for Change
Breaking Boundaries	Onipha Mudau	Realism	Youthful Expressions
Colors of Memory	Onipha Mudau	Realism	Youthful Expressions
Golden Sunrise	Lufuno Mabemisa	Realism	Realism Revealed
Mind's Reflection	Onipha Mudau	Realism	Youthful Expressions
Shadows and Light	Lufuno Mabemisa	Realism	Realism Revealed
Silent Forest	Lufuno Mabemisa	Realism	Realism Revealed
Light Within	Tshikida Mulaudzi	Surrealism	Dream Beyond Reality

The screenshot shows the Microsoft SQL Server Management Studio interface. The query editor contains the following SQL code:

```
SELECT ar.FirstName + ' ' + ar.LastName AS ArtistName,  
       g.Description AS Genre,  
       e.Description AS Exhibition  
FROM Artwork a  
JOIN Artist ar ON a.ArtistID = ar.ArtistID  
JOIN Genre g ON a.GenreID = g.GenreID  
JOIN Artwork_Exhibition ae ON a.ArtworkID = ae.ArtworkID  
JOIN Exhibition e ON ae.ExhibitionID = e.ExhibitionID  
ORDER BY g.Description ASC, a.Title ASC, e.Description ASC;
```

The Results pane displays the following data:

ArtworkTitle	ArtistName	Genre	Exhibition
Rising Spirit	Mwelelo Mshabi	Abstract	Art for Change
Unity of Cultures	Mwelelo Mshabi	Abstract	Art for Change
Breaking Boundaries	Onipha Mudau	Realism	Youthful Expressions
Colors of Memory	Onipha Mudau	Realism	Youthful Expressions
Golden Sunrise	Lufuno Mabemisa	Realism	Realism Revealed
Mind's Reflection	Onipha Mudau	Realism	Youthful Expressions
Shadows and Light	Lufuno Mabemisa	Realism	Realism Revealed
Silent Forest	Lufuno Mabemisa	Realism	Realism Revealed
Light Within	Tshikida Mulaudzi	Surrealism	Dream Beyond Reality
Portrait of Hope	Tshikida Mulaudzi	Surrealism	Dream Beyond Reality
Silent Dreams	Tshikida Mulaudzi	Surrealism	Dream Beyond Reality

Purpose Of Report: All five tables in this report exhibit a multi-table JOIN.

Conclusion

I ran across a couple difficulties with this task. In order to avoid data entry problems, I had to first carefully build the tables so that the foreign keys and primary keys met the ERD and business rules. Second, I first encountered foreign key constraint issues when doing the DELETE operation. In order to fix this, I made sure to remove entries from parent tables (like Exhibition) only in cases where the junction table has no dependent rows.

Lastly in order to satisfy the requirements and completely illustrate the many-to-many linkages, I had to modify the JOIN queries to include not only the Artwork and Exhibition tables but also the Artist and Genre tables. I was able to verify that the database operated properly and that all outcomes complied with the rubric and short requirements by testing each SQL statement using SELECT queries.

Reference List:

Connolly, T. and Begg, C. (2015) *Database systems: a practical approach to design, implementation, and management*. 6th edn. Harlow: Pearson Education.

W3Schools. (2025) *SQL tutorial*. Available at: <https://www.w3schools.com/sql/> (Accessed: 20 August 2025).

Elmasri, R. and Navathe, S. (2016) *Fundamentals of database systems*. 7th edn. Harlow: Pearson Education.

Coronel, C. and Morris, S. (2019) *Database systems: design, implementation, and management*. 13th edn. Boston, MA: Cengage Learning.