**Practicing Data Manipulation in SQL**

**Step 1: Prepare for the Application**

You’ll create a small application to manage a sample database using MySQL. The application will allow users to perform INSERT, UPDATE, and DELETE operations on a table called Users.

**Instructions:**

1. Open Visual Studio Code and connect it to a MySQL database using the terminal.
2. Create a new database called SampleDB using the command: CREATE DATABASE SampleDB;
3. Use the new database: USE SampleDB;
4. Create a table named Users with the following structure: CREATE TABLE Users (     UserID INT AUTO\_INCREMENT PRIMARY KEY,     FirstName VARCHAR(50),     LastName VARCHAR(50),     Email VARCHAR(100),     Age INT );
5. Populate the Users table with sample data: INSERT INTO Users (FirstName, LastName, Email, Age) VALUES ('Aisha', 'Khan', 'aisha.khan@example.com', 29), ('Carlos', 'Garcia', 'carlos.garcia@example.com', 35), ('Mei', 'Chen', 'mei.chen@example.com', 24);

**Step 2: Implementing an INSERT Operation**

You will write a query to add a new user to the Users table.

**Instructions:**

1. Add a new user with the following details:
   * FirstName: Arjun
   * LastName: Patel
   * Email: [arjun.patel@example.com](mailto:arjun.patel@example.com)
   * Age: 41
2. Ensure that the user has been successfully added by querying the table.

**Step З: Implementing an UPDATE Operation**

You will write a query to update the age of an existing user.

**Instructions:**

1. Update the age of the user whose FirstName is Mei to 26.
2. Ensure that only the targeted record has been updated by querying the table.

**Step 4: Implementing а DELETE Operation**

You will write a query to delete a user from the Users table.

**Instructions:**

1. Delete the user with the LastName Garcia.
2. Verify that the record has been deleted by querying the table.

**Step 5: Practicing Safety Measures**

You will practice safe SQL practices by using the WHERE clause to avoid unintentional changes.

**Instructions:**

1. Attempt to update the age of all users to 30 without using a WHERE clause. Observe the behavior.
2. Roll back the changes using the following command: ROLLBACK;
3. Retry the update for a specific user, this time using a WHERE clause to avoid unintended changes.

**SampleDB.sql:**

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-- Lab: Practicing Data Manipulation in SQL

-- Database: SampleDB

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-- Step 1. Prepare for the Application

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-- Create new database

**CREATE** **DATABASE** **IF** **NOT** **EXISTS** SampleDB;

-- Use the new database

USE SampleDB;

-- Drop table if exists (clean state)

**DROP** **TABLE** **IF** **EXISTS** Users;

-- Create Users table

**CREATE** **TABLE** Users (

UserID INT AUTO\_INCREMENT **PRIMARY** **KEY**,

FirstName VARCHAR(**50**),

LastName VARCHAR(**50**),

Email VARCHAR(**100**),

Age INT

);

-- Insert sample data

**INSERT** **INTO** Users (FirstName, LastName, Email, Age) **VALUES**

('Aisha', 'Khan', 'aisha.khan@example.com', **29**),

('Carlos', 'Garcia', 'carlos.garcia@example.com', **35**),

('Mei', 'Chen', 'mei.chen@example.com', **24**);

-- Check initial state

**SELECT** \* **FROM** Users;

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-- Step 2. INSERT Operation

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-- Add a new user Arjun Patel

**INSERT** **INTO** Users (FirstName, LastName, Email, Age)

**VALUES** ('Arjun', 'Patel', 'arjun.patel@example.com', **41**);

-- Verify insert

**SELECT** \* **FROM** Users;

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-- Step 3. UPDATE Operation

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-- Update Mei's age to 26

**UPDATE** Users

**SET** Age = **26**

**WHERE** FirstName = 'Mei';

-- Verify update

**SELECT** \* **FROM** Users **WHERE** FirstName = 'Mei';

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-- Step 4. DELETE Operation

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-- Delete Carlos Garcia

**DELETE** **FROM** Users

**WHERE** LastName = 'Garcia';

-- Verify delete

**SELECT** \* **FROM** Users;

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-- Step 5. Practicing Safety Measures

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-- Danger: Update all users' age to 30 (without WHERE)

-- (In real work, this should be avoided!)

**START** **TRANSACTION**;

**UPDATE** Users

**SET** Age = **30**;

-- Check effect

**SELECT** \* **FROM** Users;

-- Rollback the change

**ROLLBACK**;

-- Verify rollback worked

**SELECT** \* **FROM** Users;

-- Safe update: only for Arjun

**UPDATE** Users

**SET** Age = **42**

**WHERE** FirstName = 'Arjun';

-- Verify safe update

**SELECT** \* **FROM** Users **WHERE** FirstName = 'Arjun';