

# UNIVERSITY OF PETROLEUM AND ENERGY STUDIES DEHRADUN

## DATABASE SYSTEMS LAB

# LAB 4 SQL Constraints

# MTECH-COMPUTER SCIENCE ENGINEERING CYBER SECURITY AND FORENSICS

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Title: To understand and apply the concept of data constraints in SQL, focusing on Primary Key and Foreign Key constraints.

Objective: Apply various data constraints in SQL—Primary Key, Foreign Key, NOT NULL, and CHECK.

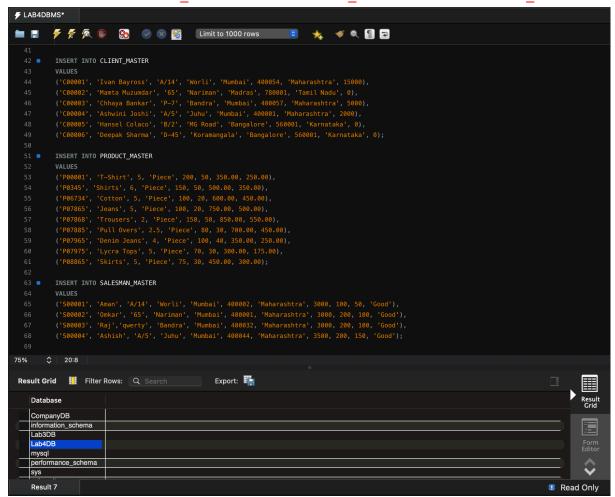
#### Tasks outline from the manual:

- 1. Create three master tables with constraints:
  - CLIENT\_MASTER
  - PRODUCT\_MASTER
  - SALESMAN\_MASTER
- 2. Insert sample data into each table.
- 3. Run retrieval queries (will help show data and confirm constraints work).

# CREATE TABLE : CLIENT\_MASTER / PRODUCT\_MASTER / SALESMAN MASTER

```
 F LAB4DBMS*
📺 🔚 🌈 🧖 🐌 😘 🥝 🔞 🖟 🍪 Limit to 1000 rows 🔞 🌟 🚿 🔍 🚹 🖘
         DROP DATABASE IF EXISTS Lab4DB;
         CREATE DATABASE Lab4DB:
       USE Lab4DB;
SHOW DATABASES;
  6 • CREATE TABLE CLIENT MASTER (
           CLIENTNO VARCHAR(6) PRIMARY KEY CHECK (CLIENTNO LIKE 'C%'),
           NAME VARCHAR(20),
           ADDRESS1 VARCHAR(30),
           ADDRESS2 VARCHAR(30) NOT NULL,
           PINCODE INT,
           STATE VARCHAR(15),
          BALDUE DECIMAL(10,2)
  17 • CREATE TABLE PRODUCT_MASTER (
           PRODUCTNO VARCHAR(6) PRIMARY KEY CHECK (PRODUCTNO LIKE 'P%'),
           DESCRIPTION VARCHAR(15) NOT NULL,
           PROFITPERC DECIMAL(4,2) NOT NULL,
           UNITMEASURE VARCHAR(10) NOT NULL,
          QTYONHAND INT NOT NULL,
           REORDERLVL INT NOT NULL,
           SELLPRICE DECIMAL(8,2) NOT NULL,
          COSTPRICE DECIMAL(8,2) NOT NULL
 28 • CREATE TABLE SALESMAN_MASTER (
            SALESMANNO VARCHAR(6) PRIMARY KEY CHECK (SALESMANNO LIKE 'S%'),
           SALESMANNAME VARCHAR(20) NOT NULL,
           ADDRESS1 VARCHAR(30) NOT NULL,
           ADDRESS2 VARCHAR(30),
           STATE VARCHAR(20),
           SALAMT DECIMAL(8,2) NOT NULL CHECK (SALAMT > 0),
           TGTTOGET DECIMAL(6,2) NOT NULL CHECK (TGTTOGET > 0),
YTDSALES DECIMAL(10,2),
            REMARKS VARCHAR(60)
```

#### INSERT INTO: CLIENT MASTER / PRODUCT MASTER / SALESMAN MASTER



- 1. Created tables using **CREATE TABLE**;
- 2. Insert data in the query using **INSERT INTO**;

While creating tables I encountered various errors which are listed at the end of the document.

#### ERRORS ENCOUNTERED / RESOLVED:

1. CREATE TABLE CLIENT\_MASTER ( CLIENTNO VARCHAR(6) PRIMARY KEY CHECK (CLIENTNO LIKE 'C%'), NAME VARCHAR(20), ADDRESS1 VARCHAR(30), ADDRESS2 VARCHAR(30) NOT NULL, CITY VARCHAR(15), PINCODE INT(8), STATE VARCHAR(15), BALDUE DECIMAL(10,2)) 0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.

In newer versions of mysql specifying INT Width is not necessary. After removing width from the INT constraints the error was resolved.

## 12 PINCODE INT,

In the given data address 1 for Raj was not specified and it fell under NOT NULL condition. To resolve this error we have two ways, a) remove NOT NULL condition, b) add a temporary address.

We cannot use method a) because Address 1 cannot be null. Therefore the error was resolved using method b). temporary address: qwerty

```
SALESMANNAME VARCHAR(20) NOT NULL,

ADDRESS1 VARCHAR(30) NOT NULL,

ADDRESS2 VARCHAR(30),

CITY VARCHAR(20)

63 INSERT INTO SALESMAN_MASTER

64 VALUES

65 ('S00001', 'Aman', 'A/14', 'Worli', 'Mumbai', 400002, 'Maharashtra', 3000, 100, 50, 'Good'),

66 ('S00002', 'Omkar', '65', 'Nariman', 'Mumbai', 400001, 'Maharashtra', 3000, 200, 100, 'Good'),

67 ('S00003', 'Raj','qwerty', 'Bandra', 'Mumbai', 400032, 'Maharashtra', 3000, 200, 100, 'Good'),

68 ('S00004', 'Ashish', 'A/5', 'Juhu', 'Mumbai', 400044, 'Maharashtra', 3500, 200, 150, 'Good');

69
```

#### **SHOW TABLES;**

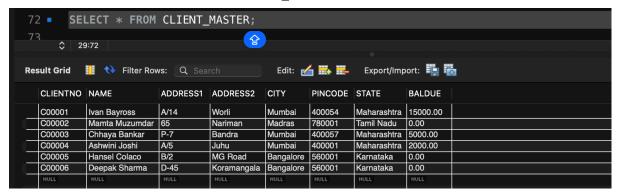


### 3. Exercises on Retrieving Records

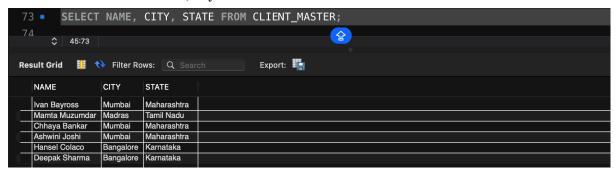
3.1 Find out the names of all the clients.



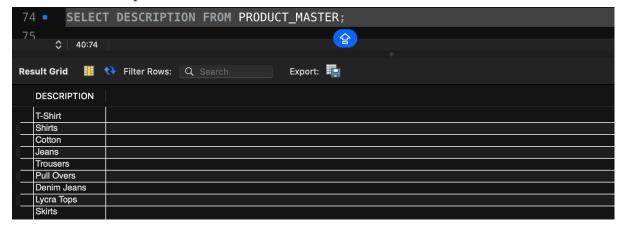
3.2 Retrieve the entire contents of the Client\_Master table.



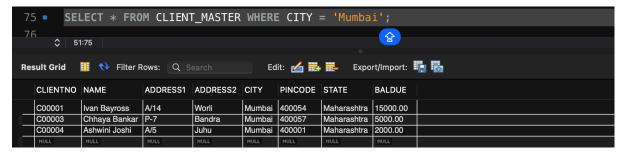
3.3 Retrieve the list of names, city and the state of all the clients.



#### 3.4 List the various products available from the Product\_Master table.



#### 3.5 List all the clients who are located in Mumbai.



#### 3.6 Find the names of salesman who have a salary equal to Rs.3000.



#### 4. Exercises on Updating Records

4.1 Change the city of ClientNo 'C00005' to 'Bangalore'.



4.2 Change the BalDue of ClientNo 'C00001' to Rs.1000.

```
79 ■ UPDATE CLIENT_MASTER SET BALDUE = 1000 WHERE CLIENTNO = 'C00001';

80

$\times$ 1:76 |

Action Output $\times$ |

Time | Action |

90 19:09:36 | UPDATE CLIENT_MASTER SET BALDUE = 1000 WHERE CLIENTNO = 'C00001' 0 row(s) affected Rows matched: 1 Changed: 0 Warnings: 0
```

4.4 Change the city of the salesman to Pune.

```
83 UPDATE SALESMAN_MASTER

84 SET CITY = 'Pune'

85 WHERE SALESMANNO = 'S00001';

86

$\times | 29:85 |

Action Output $\times | Action | Response

$\times | 68 | 19:04:15 | UPDATE SALESMAN_MASTER SET CITY = 'Pune' WHERE SALESMANNO = 'S00001' | 1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0
```

#### **5.** Exercises on Deleting Records

5.1 Delete all salesman from the Salesman\_Master whose salaries are equal to Rs.3500.

5.2 Delete all products from Product\_Master where the quantity on hand is equal to 100.

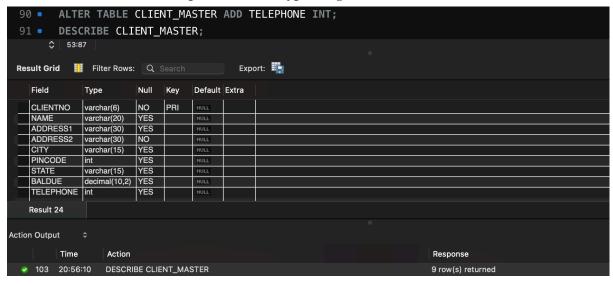


5.3 Delete from Client\_Master where the column state holds the value 'Tamil Nadu'.

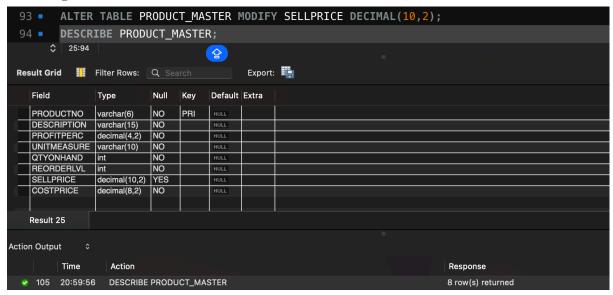


#### 6. Exercises on Altering Table Structure

6.1 Add a column called 'Telephone' of data type integer to the Client\_Master table.

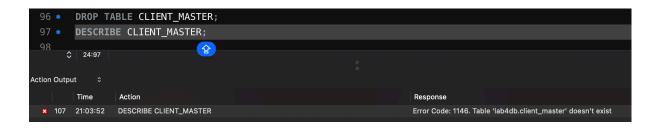


6.2 Change the size of SellPrice column in Product\_Master to 10,2.



#### 7. Exercise on Deleting Table Structure

#### 7.1 Destroy the table Client Master along with its data.



#### **Key Observation: SAFE MODE in MySQL**

- MySQL Workbench enables Safe Update Mode by default.
- In this mode, **UPDATE** and **DELETE** queries must include a **WHERE** clause using a key column (like Primary Key), or they will be blocked.
- This feature prevents accidental modification or deletion of all rows in a table.

**UPDATE SALESMAN\_MASTER SET CITY = 'Pune'**; was blocked because it had no WHERE condition.

#### The query works if written as:

UPDATE SALESMAN\_MASTER SET CITY = 'Pune' WHERE SALESMANNO =
'S00001';

Alternatively, Safe Mode can be disabled temporarily by running:

SET SQL\_SAFE\_UPDATES = 0; or permanently via Workbench Preferences.