



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

```

1 DROP DATABASE IF EXISTS Lab4DB;
2 CREATE DATABASE Lab4DB;
3 USE Lab4DB;
4 SHOW DATABASES;
5
6 CREATE TABLE CLIENT_MASTER (
7     CLIENTNO VARCHAR(6) PRIMARY KEY CHECK (CLIENTNO LIKE 'C%'),
8     NAME VARCHAR(20),
9     ADDRESS1 VARCHAR(30),
10    ADDRESS2 VARCHAR(30) NOT NULL,
11    CITY VARCHAR(15),
12    PINCODE INT,
13    STATE VARCHAR(15),
14    BALDUE DECIMAL(10,2)
15 );
16
17 CREATE TABLE PRODUCT_MASTER (
18     PRODUCTNO VARCHAR(6) PRIMARY KEY CHECK (PRODUCTNO LIKE 'P%'),
19     DESCRIPTION VARCHAR(15) NOT NULL,
20     PROFITPERC DECIMAL(4,2) NOT NULL,
21     UNITMEASURE VARCHAR(10) NOT NULL,
22     QTYONHAND INT NOT NULL,
23     REORDERLVL INT NOT NULL,
24     SELLPRICE DECIMAL(8,2) NOT NULL,
25     COSTPRICE DECIMAL(8,2) NOT NULL
26 );
27
28 CREATE TABLE SALESMAN_MASTER (
29     SALESMANNO VARCHAR(6) PRIMARY KEY CHECK (SALESMANNO LIKE 'S%'),
30     SALESMANNAME VARCHAR(20) NOT NULL,
31     ADDRESS1 VARCHAR(30) NOT NULL,
32     ADDRESS2 VARCHAR(30),
33     CITY VARCHAR(20),
34     PINCODE INT,
35     STATE VARCHAR(20),
36     SALAMT DECIMAL(8,2) NOT NULL CHECK (SALAMT > 0),
37     TGTTOGET DECIMAL(6,2) NOT NULL CHECK (TGTTOGET > 0),
38     YTDSALES DECIMAL(10,2),
39     REMARKS VARCHAR(60)
40 );
41
  
```

INSERT INTO: CLIENT_MASTER / PRODUCT_MASTER / SALESMAN_MASTER

```

41
42 INSERT INTO CLIENT_MASTER
43 VALUES
44 ('C00001', 'Ivan Bayross', 'A/14', 'Worli', 'Mumbai', 400054, 'Maharashtra', 15000),
45 ('C00002', 'Mamta Muzumdar', '65', 'Nariman', 'Madras', 780001, 'Tamil Nadu', 0),
46 ('C00003', 'Chhaya Bankar', 'P-7', 'Bandra', 'Mumbai', 400057, 'Maharashtra', 5000),
47 ('C00004', 'Ashwini Joshi', 'A/5', 'Juhu', 'Mumbai', 400001, 'Maharashtra', 2000),
48 ('C00005', 'Hansel Colaco', 'B/2', 'MG Road', 'Bangalore', 560001, 'Karnataka', 0),
49 ('C00006', 'Deepak Sharma', 'D-45', 'Koramangala', 'Bangalore', 560001, 'Karnataka', 0);
50
51 INSERT INTO PRODUCT_MASTER
52 VALUES
53 ('P00001', 'T-Shirt', 5, 'Piece', 200, 50, 350.00, 250.00),
54 ('P0345', 'Shirts', 6, 'Piece', 150, 50, 500.00, 350.00),
55 ('P06734', 'Cotton', 5, 'Piece', 100, 20, 600.00, 450.00),
56 ('P07865', 'Jeans', 5, 'Piece', 100, 20, 750.00, 500.00),
57 ('P07868', 'Trousers', 2, 'Piece', 150, 50, 850.00, 550.00),
58 ('P07885', 'Pull Overs', 2.5, 'Piece', 80, 30, 700.00, 450.00),
59 ('P07965', 'Denim Jeans', 4, 'Piece', 100, 40, 350.00, 250.00),
60 ('P07975', 'Lycra Tops', 5, 'Piece', 70, 30, 300.00, 175.00),
61 ('P08865', 'Skirts', 5, 'Piece', 75, 30, 450.00, 300.00);
62
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

```

75% 20:8

Result Grid Filter Rows: Search Export:

Database	
CompanyDB	
information_schema	
Lab3DB	
Lab4DB	
mysql	
performance_schema	
sys	

Result 7 Read Only

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,

- 2. INSERT INTO SALESMAN_MASTER VALUES ('S00001', 'Aman', 'A/14', 'Worli', 'Mumbai', 400002, 'Maharashtra', 3000, 100, 50, 'Good'), ('S00002', 'Omkar', '65', 'Nariman', 'Mumbai', 400001, 'Maharashtra', 3000, 200, 100, 'Good'), ('S00003', 'Raj', NULL, 'Bandra', 'Mumbai', 400032, 'Maharashtra', 3000, 200, 100, 'Good'), ('S00004', 'Ashish', 'A/5', 'Juhu', 'Mumbai', 400044, 'Maharashtra', 3500, 200, 150, 'Good') Error Code: 1048. Column 'ADDRESS1' cannot be null**

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;

69

70 • SHOW TABLES;

14:70

Result Grid Filter Rows: Search Export:

Tables_in_lab4db
CLIENT_MASTER
PRODUCT_MASTER
SALESMAN_MASTER

Result 8 Read Only

3. Exercises on Retrieving Records

3.1 Find out the names of all the clients.

70 • SHOW TABLES;

71 SELECT NAME FROM CLIENT_MASTER;

72

32:71

Result Grid Filter Rows: Search Export:

NAME
Ivan Bayross
Mamta Muzumdar
Chhaya Bankar
Ashwini Joshi
Hansel Colaco
Deepak Sharma

3.2 Retrieve the entire contents of the Client_Master table.

72 • SELECT * FROM CLIENT_MASTER;

73

29:72

Result Grid Filter Rows: Search Edit: Export/Import:

CLIENTNO	NAME	ADDRESS1	ADDRESS2	CITY	PINCODE	STATE	BALDUE
C00001	Ivan Bayross	A/14	Worli	Mumbai	400054	Maharashtra	15000.00
C00002	Mamta Muzumdar	65	Nariman	Madras	780001	Tamil Nadu	0.00
C00003	Chhaya Bankar	P-7	Bandra	Mumbai	400057	Maharashtra	5000.00
C00004	Ashwini Joshi	A/5	Juhu	Mumbai	400001	Maharashtra	2000.00
C00005	Hansel Colaco	B/2	MG Road	Bangalore	560001	Karnataka	0.00
C00006	Deepak Sharma	D-45	Koramangala	Bangalore	560001	Karnataka	0.00
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

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

73 • SELECT NAME, CITY, STATE FROM CLIENT_MASTER;

74

45:73

Result Grid Filter Rows: Search Export:

NAME	CITY	STATE
Ivan Bayross	Mumbai	Maharashtra
Mamta Muzumdar	Madras	Tamil Nadu
Chhaya Bankar	Mumbai	Maharashtra
Ashwini Joshi	Mumbai	Maharashtra
Hansel Colaco	Bangalore	Karnataka
Deepak Sharma	Bangalore	Karnataka

3.4 List the various products available from the Product_Master table.

74 • `SELECT DESCRIPTION FROM PRODUCT_MASTER;`

75

Result Grid Filter Rows: Search Export:

DESCRIPTION
T-Shirt
Shirts
Cotton
Jeans
Trousers
Pull Overs
Denim Jeans
Lycra Tops
Skirts

3.5 List all the clients who are located in Mumbai.

75 • `SELECT * FROM CLIENT_MASTER WHERE CITY = 'Mumbai';`

76

Result Grid Filter Rows: Search Edit: Export/Import:

CLIENTNO	NAME	ADDRESS1	ADDRESS2	CITY	PINCODE	STATE	BALDUE
C00001	Ivan Bayross	A/14	Worli	Mumbai	400054	Maharashtra	15000.00
C00003	Chhaya Bankar	P-7	Bandra	Mumbai	400057	Maharashtra	5000.00
C00004	Ashwini Joshi	A/5	Juhu	Mumbai	400001	Maharashtra	2000.00
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

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

76 • `SELECT SALESMANNAME FROM SALESMAN_MASTER WHERE SALAMT = 3000;`

77

Result Grid Filter Rows: Search Export:

SALESMANNAME
Aman
Omkar
Raj

4. Exercises on Updating Records

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

78	•	UPDATE CLIENT_MASTER SET CITY = 'Bangalore' WHERE CLIENTNO = 'C00005';
79		
	↕	71:78
Action Output		
	Time	Action
✓ 63	15:14:38	UPDATE CLIENT_MASTER SET CITY = 'Bangalore' WHERE CLIENTNO... 0 row(s) affected Rows matched: 1 Changed: 0 Warnings: 0

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

79	•	UPDATE CLIENT_MASTER SET BALDUE = 1000 WHERE CLIENTNO = 'C00001';
80		
	↕	1:76
Action Output		
	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		
	↕	29:85
Action Output		
	Time	Action
✓ 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.

87	•	DELETE FROM SALESMAN_MASTER WHERE SALAMT = 3500;
88		
	↕	53:87
Action Output		
	Time	Action
✓ 99	20:50:59	DELETE FROM SALESMAN_MASTER WHERE SALAMT = 3500 0 row(s) affected

5.2 Delete all products from Product_Master where the quantity on hand is equal to 100.

87	•	DELETE FROM PRODUCT_MASTER WHERE QTYONHAND = 100;
88		
	↕	52:87
Action Output		
	Time	Action
✓ 100	20:52:19	DELETE FROM PRODUCT_MASTER WHERE QTYONHAND = 100 3 row(s) affected

5.3 Delete from Client_Master where the column state holds the value 'Tamil Nadu'.

```

88 • DELETE FROM CLIENT_MASTER WHERE STATE = 'Tamil Nadu';
89
90

```

11:88

Action Output

	Time	Action	Response
✓ 101	20:53:21	DELETE FROM CLIENT_MASTER WHERE STATE = 'Tamil Nadu'	1 row(s) affected

6. Exercises on Altering Table Structure

6.1 Add a column called 'Telephone' of data type integer to the Client_Master table.

```

90 • ALTER TABLE CLIENT_MASTER ADD TELEPHONE INT;
91 • DESCRIBE CLIENT_MASTER;

```

53:87

Result Grid

Field	Type	Null	Key	Default	Extra
CLIENTNO	varchar(6)	NO	PRI	NULL	
NAME	varchar(20)	YES		NULL	
ADDRESS1	varchar(30)	YES		NULL	
ADDRESS2	varchar(30)	NO		NULL	
CITY	varchar(15)	YES		NULL	
PINCODE	int	YES		NULL	
STATE	varchar(15)	YES		NULL	
BALDUE	decimal(10,2)	YES		NULL	
TELEPHONE	int	YES		NULL	

Result 24

Action Output

	Time	Action	Response
✓ 103	20:56:10	DESCRIBE CLIENT_MASTER	9 row(s) returned

6.2 Change the size of SellPrice column in Product_Master to 10,2.

```

93 • ALTER TABLE PRODUCT_MASTER MODIFY SELLPRICE DECIMAL(10,2);
94 • DESCRIBE PRODUCT_MASTER;

```

25:94

Result Grid

Field	Type	Null	Key	Default	Extra
PRODUCTNO	varchar(6)	NO	PRI	NULL	
DESCRIPTION	varchar(15)	NO		NULL	
PROFITPERC	decimal(4,2)	NO		NULL	
UNITMEASURE	varchar(10)	NO		NULL	
QTYONHAND	int	NO		NULL	
REORDERLVL	int	NO		NULL	
SELLPRICE	decimal(10,2)	YES		NULL	
COSTPRICE	decimal(8,2)	NO		NULL	

Result 25

Action Output

	Time	Action	Response
✓ 105	20:59:56	DESCRIBE PRODUCT_MASTER	8 row(s) returned

7. Exercise on Deleting Table Structure

7.1 Destroy the table Client_Master along with its data.

```

96 DROP TABLE CLIENT_MASTER;
97 DESCRIBE CLIENT_MASTER;
98

```

24:97

Action Output

	Time	Action	Response
107	21:03:52	DESCRIBE CLIENT_MASTER	Error Code: 1146. Table 'lab4db.client_master' doesn't exist

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.