Roll No. :- COMPTEB1449

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Assignment No. 3

Title :- Design SQL Queries using DML commands : JOIN, Sub-query & view.

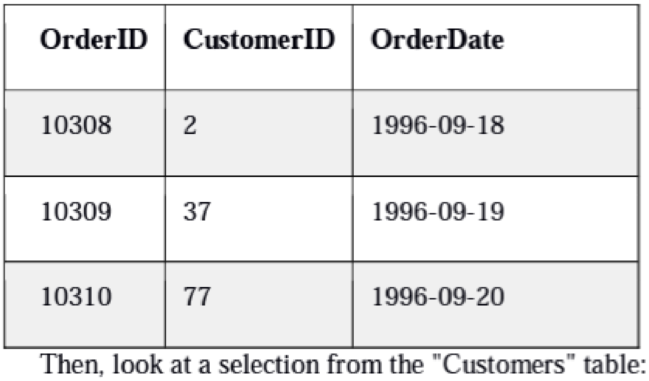
Problem Statement :- Design at least 10 SQL queries for suitable database application using SQL DML statements: all types of Join, Sub-Query and View.

Objectives :-

1. To learn and understand DML statements in MySQL
2. To learn SQL Joins, Subqueries & Views.

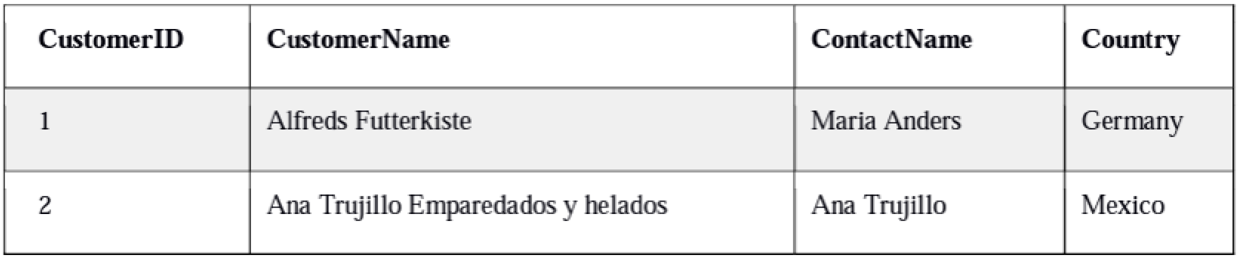
Theory :-

SQL JOIN:- A JOIN clause is used to combine rows from two or more tables, based on a related column between them. Let's look at a selection from the "Orders" table:



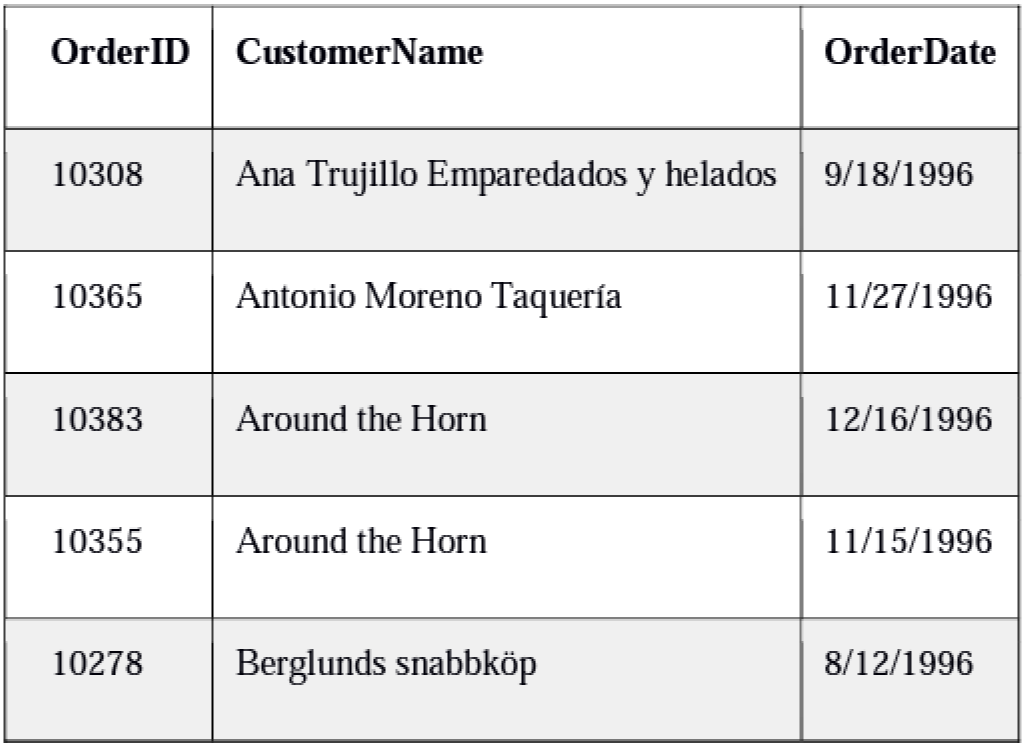
OrderID	CustomerID	OrderDate
10308	2	1996-09-18
10309	37	1996-09-19
10310	77	1996-09-20

Then, look at a selection from the "Customers" table:



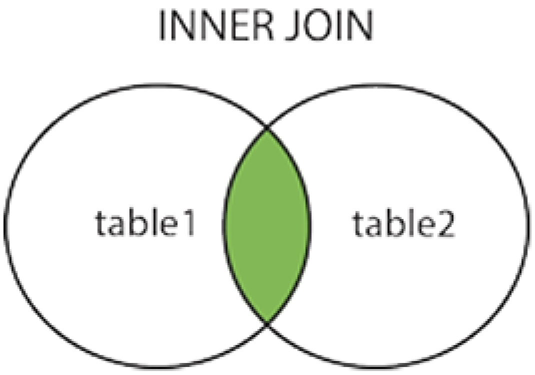
CustomerID	CustomerName	ContactName	Country
1	Alfreds Futterkiste	Maria Anders	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Mexico

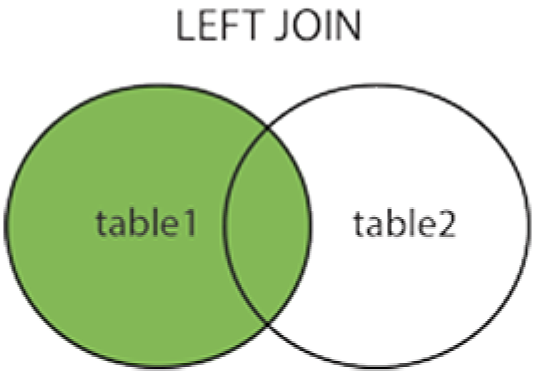
- Note that the "CustomerID" column in the "Orders" table refers to the "CustomerID" in the "Customers" table.
- The relationship between the two tables above is the "CustomerID" column.Then, we can create the following SQL statement (that contains an INNER JOIN), that selects records that have matching values in both tables:
- Example: SELECT Orders.OrderID, Customers.CustomerName, Orders.OrderDate FROM Orders INNER JOIN Customers ON Orders.CustomerID=Customers.CustomerID; and it will produce something like this:

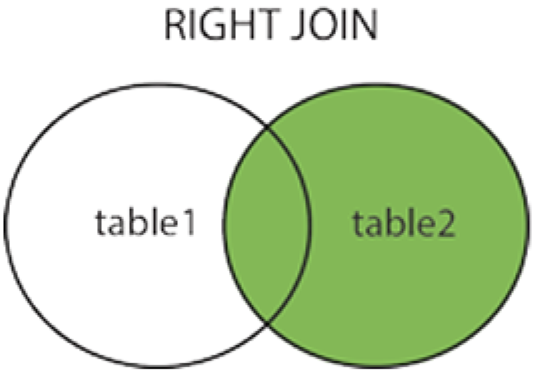


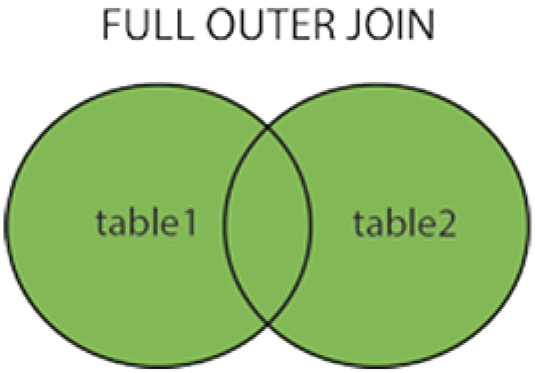
OrderID	CustomerName	OrderDate
10308	Ana Trujillo Emparedados y helados	9/18/1996
10365	Antonio Moreno Taquería	11/27/1996
10383	Around the Horn	12/16/1996
10355	Around the Horn	11/15/1996
10278	Berglunds snabbköp	8/12/1996

- **Different Types of SQL JOINs**: Here are the different types of the JOINs in SQL:
- ***(INNER) JOIN*****:** Returns records that have matching values in both tables.
- ***LEFT (OUTER) JOIN***: Return all records from the left table, and the matched records from the right table.
- ***RIGHT (OUTER) JOIN***: Return all records from the right table, and the matched records from the left table.
- ***FULL (OUTER) JOIN***: Return all records when there is a match in either left or right table.









SQL Views :-

- **SQL CREATE VIEW** Statement In SQL, a view is a virtual table based on the result-set of an SQL statement. A view contains rows and columns, just like a real table. The fields in a view are fields from one or more real tables in the database. You can add SQL functions, WHERE, and JOIN statements to a view and present the data as if the data were coming from one single table.
- **CREATE VIEW Syntax**:
- CREATE VIEW view_name AS
- SELECT column1, column2, ...
- FROM table_name
- WHERE condition;
- **SQL CREATE VIEW Examples:** The view "Product List" lists all active products (products that are not discontinued) from the "Products" table. The view is created with the following SQL:
- CREATE VIEW ProductList AS
- SELECT ProductID, ProductName
- FROM Products
- WHERE Discontinued = No;
- Then, we can query the view as follows:
- SELECT * FROM ProductList;
- **SQL Updating a View:** You can update a view by using the following syntax:
- SQL CREATE OR REPLACE VIEW Syntax
- CREATE OR REPLACE VIEW view_name AS
- SELECT column1, column2, ...
- FROM table_name

- WHERE condition;

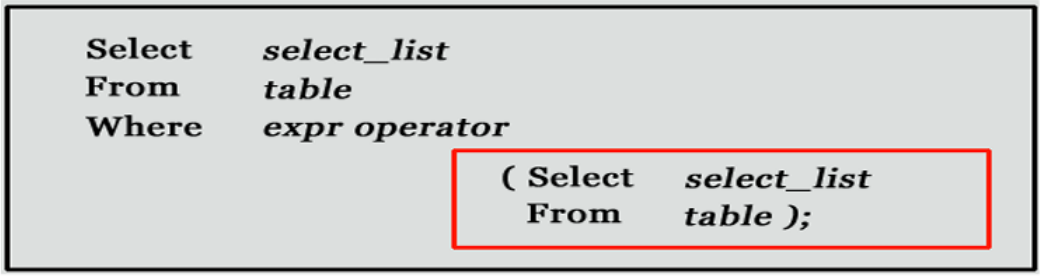
Now we want to add the "Category" column to the "Product List" view. We will update the view with the following SQL:

```
CREATE OR REPLACE VIEW Product List AS
SELECT ProductID, ProductName, Category
FROM Products
WHERE Discontinued = No;
```

Subqueries :-

- A subquery is a SQL query nested inside a larger query. A subquery may occur in : - A SELECT clause - A FROM clause - A WHERE clause In MySQL subquery can be nested inside a SELECT, INSERT, UPDATE, DELETE, SET, or DO statement or inside another subquery.
- A subquery is usually added within the WHERE Clause of another SQL SELECT statement. You can use the comparison operators, such as >, <, or =.
- The comparison operator can also be a multiple-row operator, such as IN, ANY, SOME, or ALL.
- A subquery can be treated as an inner query, which is a SQL query placed as a part of another query called as outer query.
- The inner query executes first before its parent query so that the results of the inner query can be passed to the outer query.

- **Subquery Syntax :**



```
Select      select_list
From        table
Where       expr operator
                          ( Select    select_list
                            From      table );
```

- The subquery (inner query) executes once before the main query (outer query) executes.
- The main query (outer query) use the subquery result.

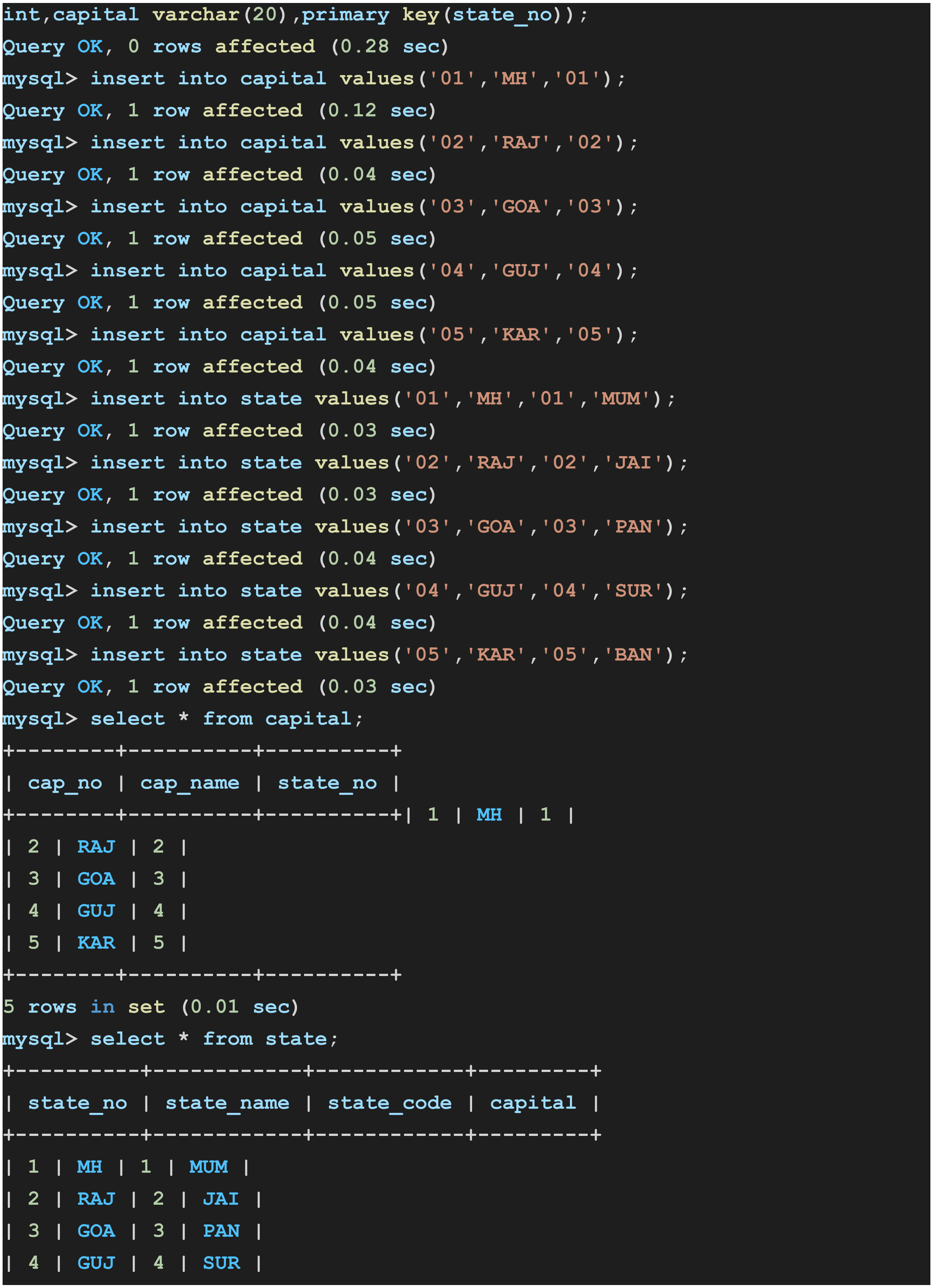
Types of Subqueries :-

- The Subquery as Scalar Operand.
- Comparisons using Subqueries.
- Subqueries with ALL, ANY, IN, or SOME.
- Row Subqueries.
- Subqueries with EXISTS or NOT EXISTS.
- Correlated Subqueries Subqueries in the FROM Clause.

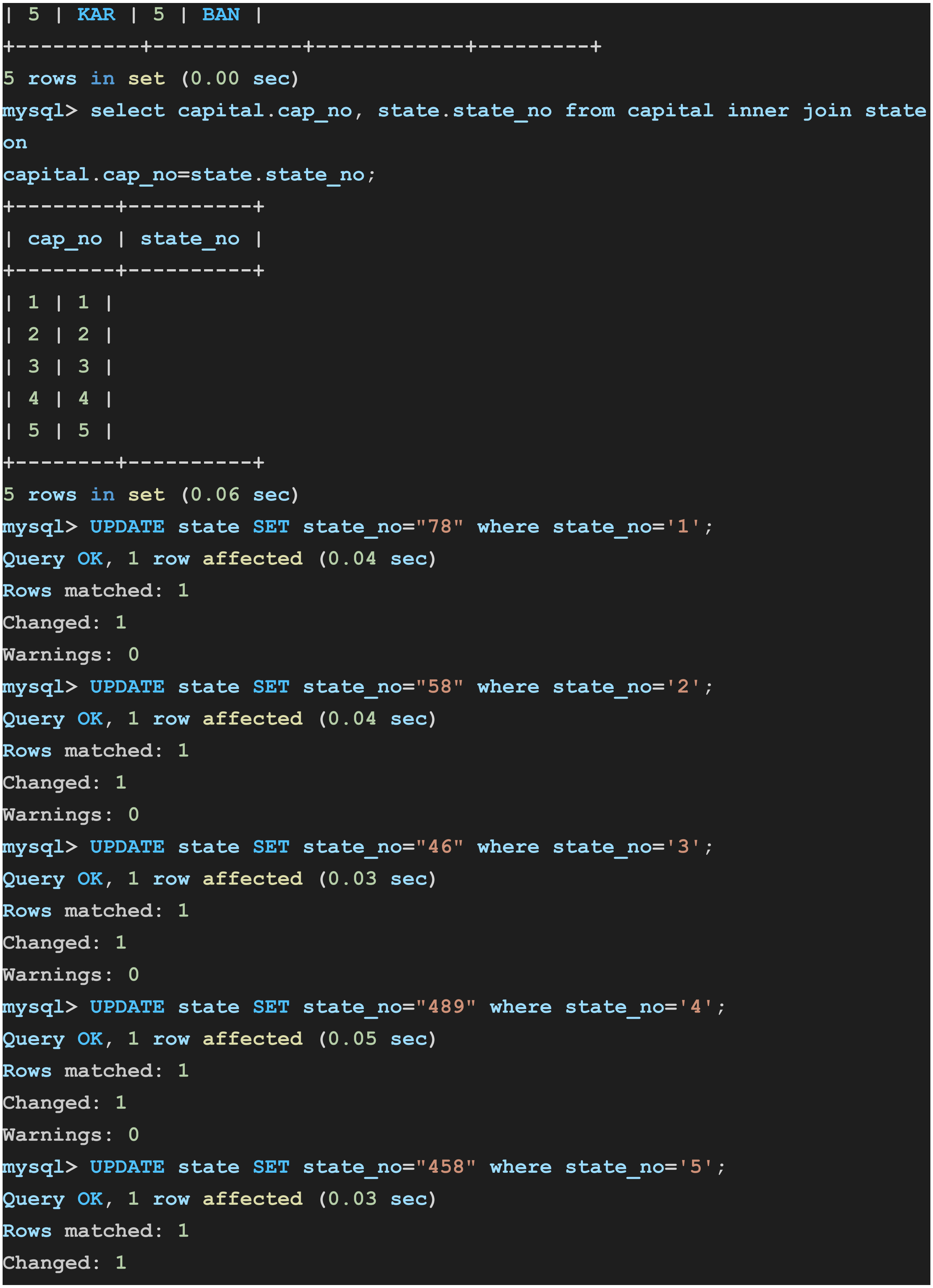
Outcomes :- Performed Different types of SQL Queries.

Code and Output :-

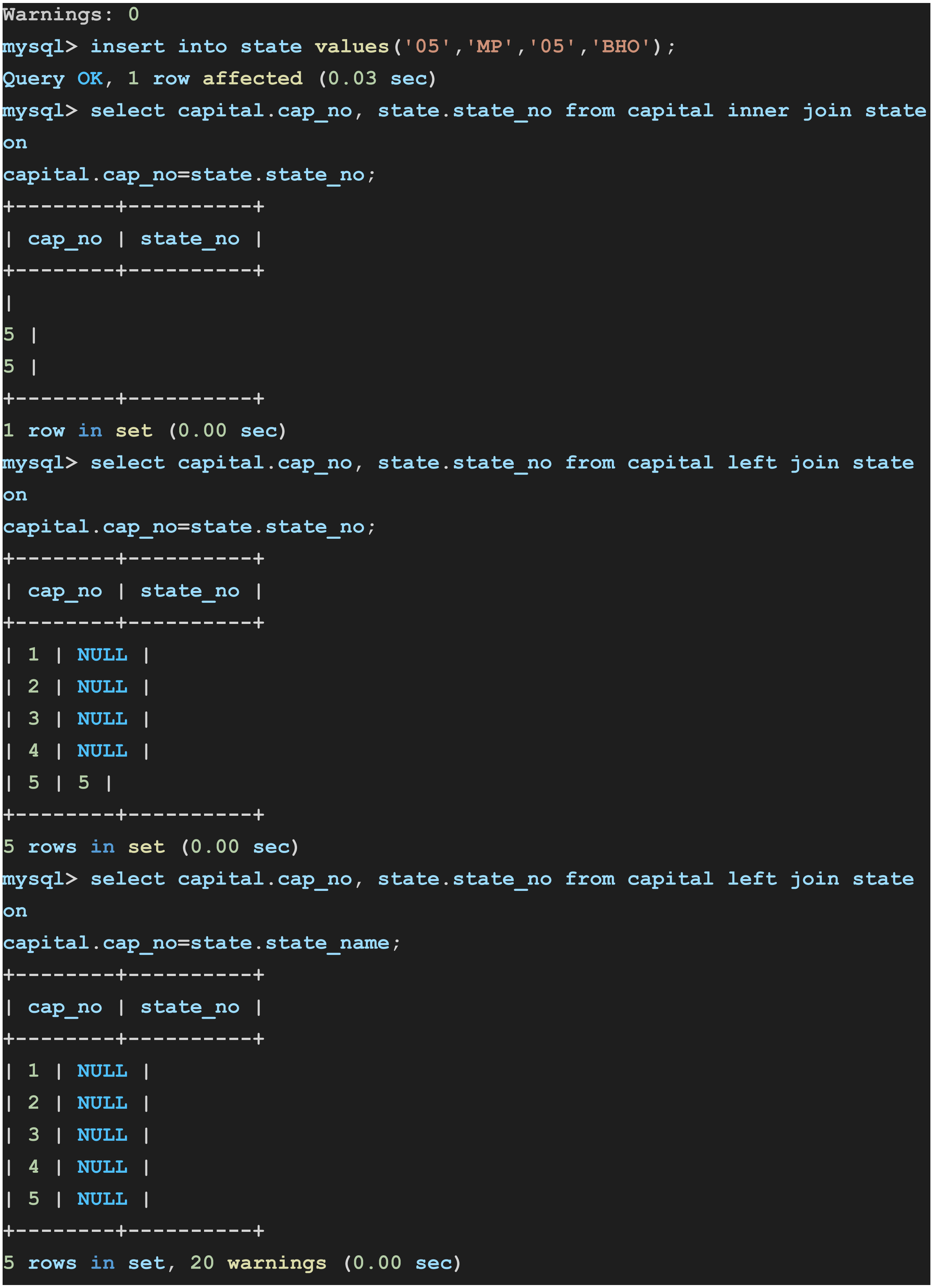
```
mysql> show databases;
+--------------------+
| Database
|
+--------------------+
| information_schema |
| A |
| db3 |
| COMPUTER |
| H |
| PVG |
| RENUKA |
| mysql |
| nishant |
| nishantl |
| performance_schema |
| renuka |
| sys |
| time |
+--------------------+
14 rows in set (0.21 sec)
mysql> use db3;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -ADatabase
changed
mysql> show tables;
+----------------+
| Tables_in_Abhi |
+----------------+
| Employee |
| TE |
| auto |
| c_master |
| product_master |
+----------------+
5 rows in set (0.00 sec)
mysql> create table _master(product_no int,description
varchar(20),profit_per
float,unit_measure varchar(10),quantity int,reorder int,sell_price
float,cost_price float,primary key(product_no));
Query OK, 0 rows affected (0.55 sec)
mysql> create table customer(cust_no int,cust_name varchar(20),cust_add
varchar(20),phone_no int,primary key(cust_no));
Query OK, 0 rows affected (0.28 sec)
mysql> create table capital(cap_no int,cap_name varchar(20),state_no
int,primary key(cap_no));
Query OK, 0 rows affected (0.27 sec)
mysql> create table state(state_no int,state_name varchar(20),state_code
```



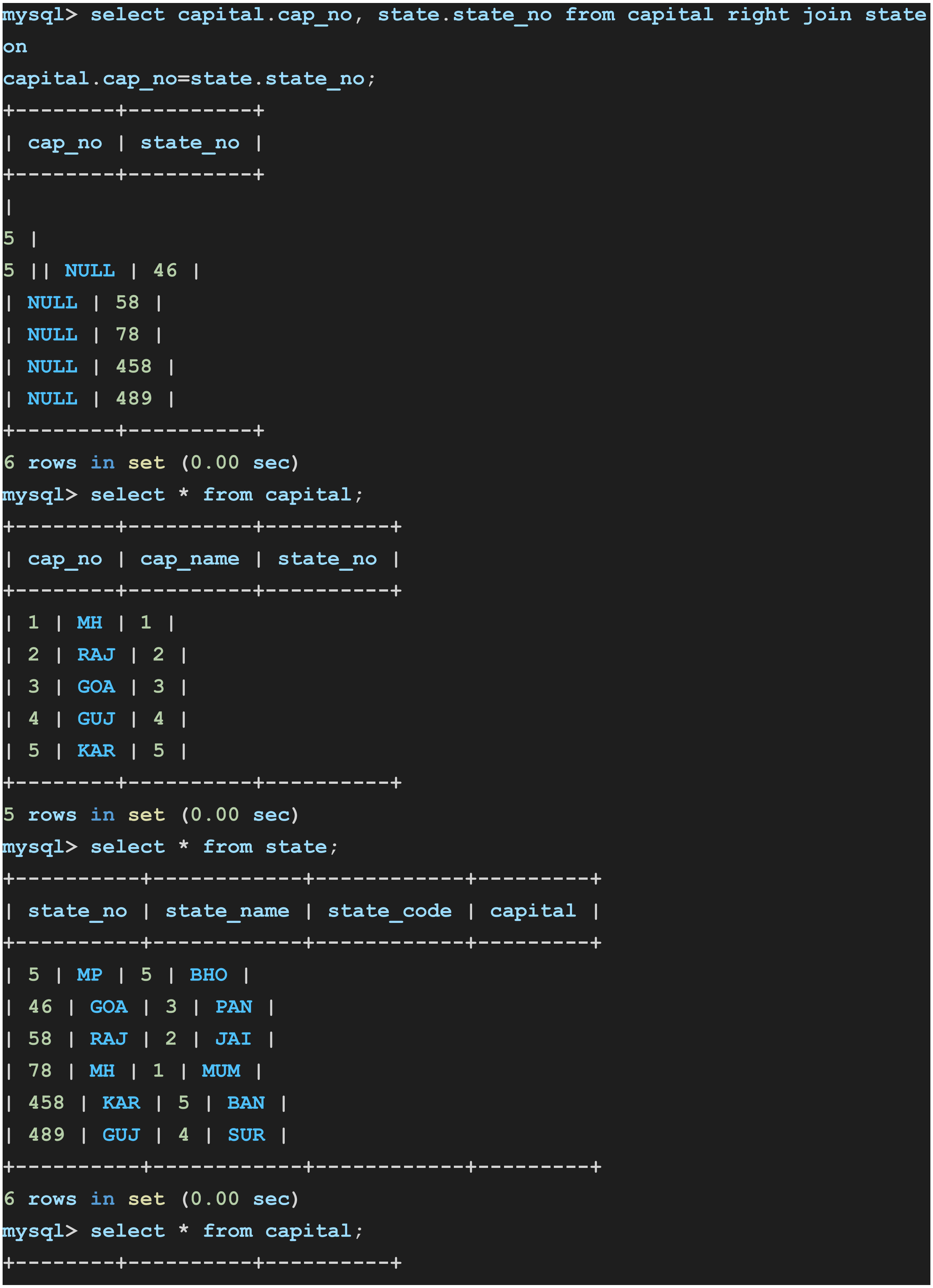
```
int,capital varchar(20),primary key(state_no));
Query OK, 0 rows affected (0.28 sec)
mysql> insert into capital values('01','MH','01');
Query OK, 1 row affected (0.12 sec)
mysql> insert into capital values('02','RAJ','02');
Query OK, 1 row affected (0.04 sec)
mysql> insert into capital values('03','GOA','03');
Query OK, 1 row affected (0.05 sec)
mysql> insert into capital values('04','GUJ','04');
Query OK, 1 row affected (0.05 sec)
mysql> insert into capital values('05','KAR','05');
Query OK, 1 row affected (0.04 sec)
mysql> insert into state values('01','MH','01','MUM');
Query OK, 1 row affected (0.03 sec)
mysql> insert into state values('02','RAJ','02','JAI');
Query OK, 1 row affected (0.03 sec)
mysql> insert into state values('03','GOA','03','PAN');
Query OK, 1 row affected (0.04 sec)
mysql> insert into state values('04','GUJ','04','SUR');
Query OK, 1 row affected (0.04 sec)
mysql> insert into state values('05','KAR','05','BAN');
Query OK, 1 row affected (0.03 sec)
mysql> select * from capital;
+--------+----------+----------+
| cap_no | cap_name | state_no |
+--------+----------+----------+| 1 | MH | 1 |
| 2 | RAJ | 2 |
| 3 | GOA | 3 |
| 4 | GUJ | 4 |
| 5 | KAR | 5 |
+--------+----------+----------+
5 rows in set (0.01 sec)
mysql> select * from state;
+----------+------------+------------+---------+
| state_no | state_name | state_code | capital |
+----------+------------+------------+---------+
| 1 | MH | 1 | MUM |
| 2 | RAJ | 2 | JAI |
| 3 | GOA | 3 | PAN |
| 4 | GUJ | 4 | SUR |
```



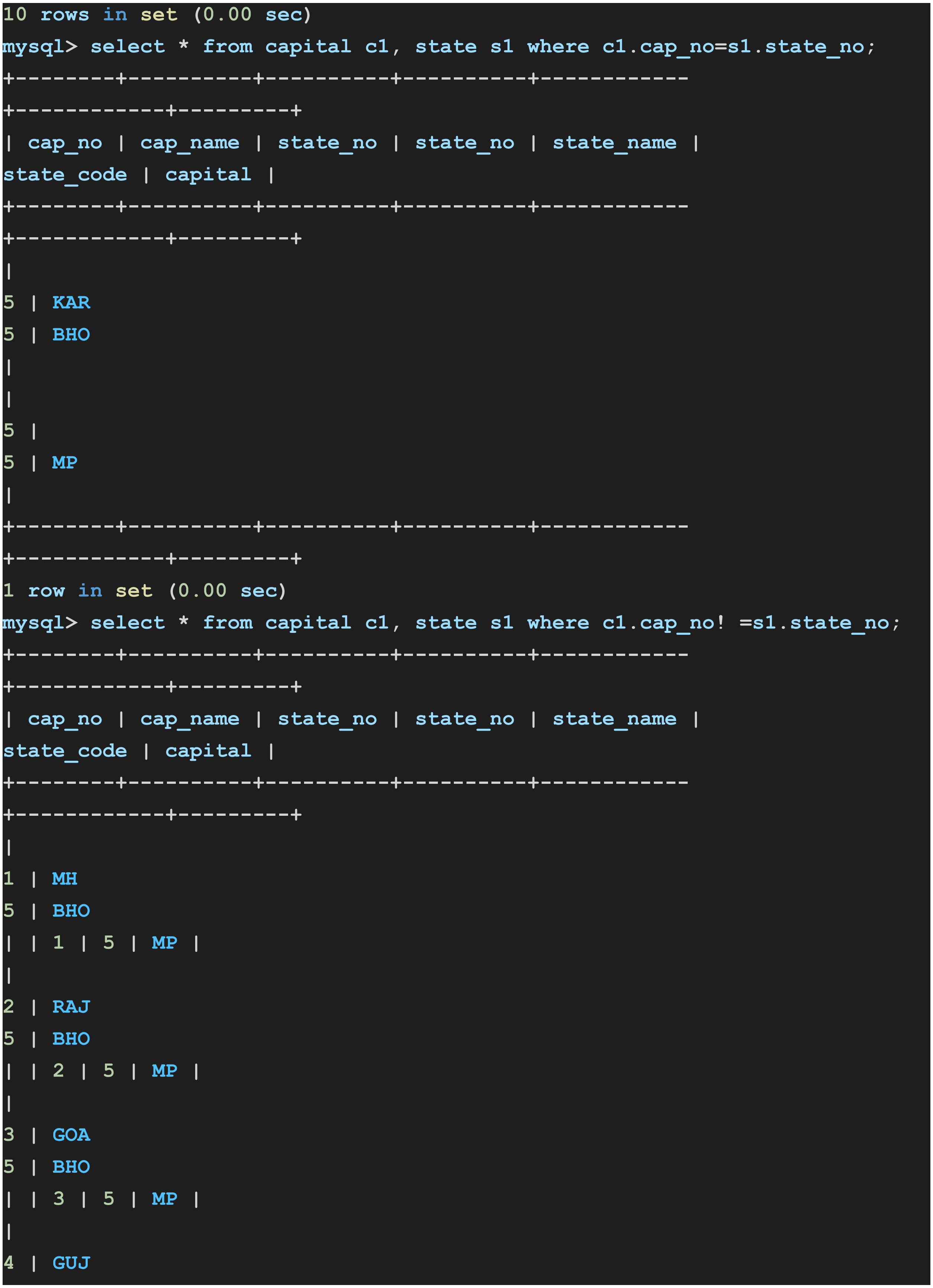
```
| 5 | KAR | 5 | BAN |
+----------+------------+------------+---------+
5 rows in set (0.00 sec)
mysql> select capital.cap_no, state.state_no from capital inner join state
on
capital.cap_no=state.state_no;
+--------+----------+
| cap_no | state_no |
+--------+----------+
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
+--------+----------+
5 rows in set (0.06 sec)
mysql> UPDATE state SET state_no="78" where state_no='1';
Query OK, 1 row affected (0.04 sec)
Rows matched: 1
Changed: 1
Warnings: 0
mysql> UPDATE state SET state_no="58" where state_no='2';
Query OK, 1 row affected (0.04 sec)
Rows matched: 1
Changed: 1
Warnings: 0
mysql> UPDATE state SET state_no="46" where state_no='3';
Query OK, 1 row affected (0.03 sec)
Rows matched: 1
Changed: 1
Warnings: 0
mysql> UPDATE state SET state_no="489" where state_no='4';
Query OK, 1 row affected (0.05 sec)
Rows matched: 1
Changed: 1
Warnings: 0
mysql> UPDATE state SET state_no="458" where state_no='5';
Query OK, 1 row affected (0.03 sec)
Rows matched: 1
Changed: 1
```



```
Warnings: 0
mysql> insert into state values('05','MP','05','BHO');
Query OK, 1 row affected (0.03 sec)
mysql> select capital.cap_no, state.state_no from capital inner join state
on
capital.cap_no=state.state_no;
+--------+----------+
| cap_no | state_no |
+--------+----------+
|
5 |
5 |
+--------+----------+
1 row in set (0.00 sec)
mysql> select capital.cap_no, state.state_no from capital left join state
on
capital.cap_no=state.state_no;
+--------+----------+
| cap_no | state_no |
+--------+----------+
| 1 | NULL |
| 2 | NULL |
| 3 | NULL |
| 4 | NULL |
| 5 | 5 |
+--------+----------+
5 rows in set (0.00 sec)
mysql> select capital.cap_no, state.state_no from capital left join state
on
capital.cap_no=state.state_name;
+--------+----------+
| cap_no | state_no |
+--------+----------+
| 1 | NULL |
| 2 | NULL |
| 3 | NULL |
| 4 | NULL |
| 5 | NULL |
+--------+----------+
5 rows in set, 20 warnings (0.00 sec)
```

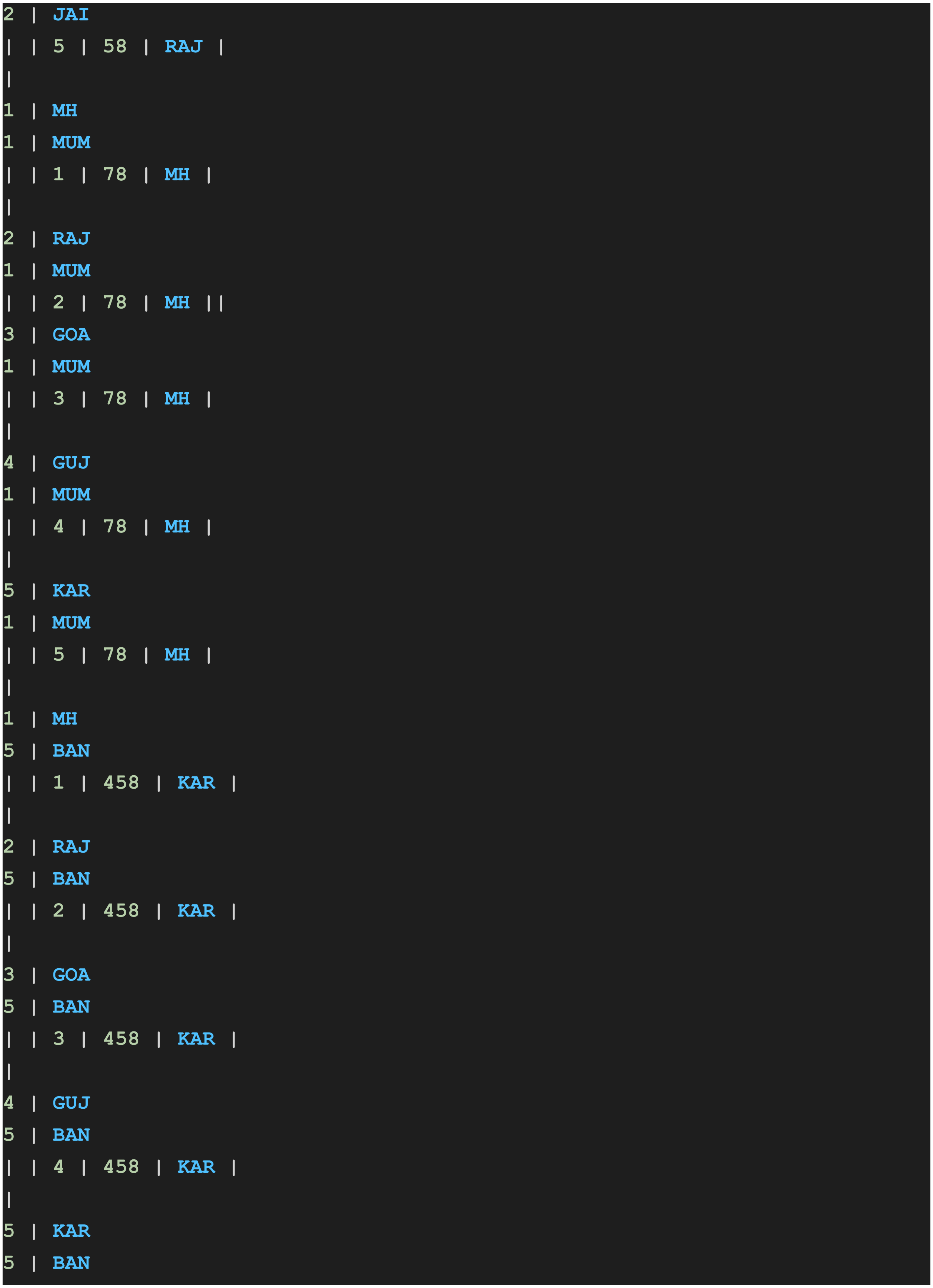


```
mysql> select capital.cap_no, state.state_no from capital right join state
on
capital.cap_no=state.state_no;
+--------+----------+
| cap_no | state_no |
+--------+----------+
|
5 |
5 || NULL | 46 |
| NULL | 58 |
| NULL | 78 |
| NULL | 458 |
| NULL | 489 |
+--------+----------+
6 rows in set (0.00 sec)
mysql> select * from capital;
+--------+----------+----------+
| cap_no | cap_name | state_no |
+--------+----------+----------+
| 1 | MH | 1 |
| 2 | RAJ | 2 |
| 3 | GOA | 3 |
| 4 | GUJ | 4 |
| 5 | KAR | 5 |
+--------+----------+----------+
5 rows in set (0.00 sec)
mysql> select * from state;
+----------+------------+------------+---------+
| state_no | state_name | state_code | capital |
+----------+------------+------------+---------+
| 5 | MP | 5 | BHO |
| 46 | GOA | 3 | PAN |
| 58 | RAJ | 2 | JAI |
| 78 | MH | 1 | MUM |
| 458 | KAR | 5 | BAN |
| 489 | GUJ | 4 | SUR |
+----------+------------+------------+---------+
6 rows in set (0.00 sec)
mysql> select * from capital;
+--------+----------+----------+
| cap_no | cap_name | state_no |
+--------+----------+----------+
| 1 | MH | 1 |
| 2 | RAJ | 2 |
| 3 | GOA | 3 |
| 4 | GUJ | 4 |
| 5 | KAR | 5 |
+--------+----------+----------+
5 rows in set (0.00 sec)
mysql> select capital.cap_no, state.state_no from capital inner join state
on
capital.cap_no=state.state_no;
+--------+----------+
| cap_no | state_no |
+--------+----------+
|
5 |
5 |
+--------+----------+
1 row in set (0.00 sec)
mysql> select capital.cap_no,capital.cap_name,state.capital,state.state_no
from
capital inner join state on capital.cap_no=state.state_no;
+--------+----------+---------+----------+
| cap_no | cap_name | capital | state_no |
+--------+----------+---------+----------+
|
5 | KAR
| BHO
|
5 |
+--------+----------+---------+----------+
1 row in set (0.00 sec)
mysql> select capital.cap_no,capital.cap_name,state.capital,state.state_no
from capital left join state on capital.cap_no=state.state_no;
+--------+----------+---------+----------+
| cap_no | cap_name | capital | state_no |
+--------+----------+---------+----------+
| 1 | MH | NULL | NULL |
| 2 | RAJ | NULL | NULL |
| 3 | GOA | NULL | NULL |
| 4 | GUJ | NULL | NULL |
| 5 | KAR | BHO | 5 |
+--------+----------+--------+----------+
5 rows in set (0.00 sec)
mysql> select capital.cap_no,capital.cap_name,state.capital,state.state_no
from capital right join state on capital.cap_no=state.state_no;
+--------+----------+--------+----------+
| cap_no | cap_name | capital | state_no |
+--------+----------+--------+----------+
|
5 | KAR
| BHO | 5 |
| NULL | NULL | PAN | 46 |
| NULL | NULL | JAI | 58 |
| NULL | NULL | MUM | 78 |
| NULL | NULL | BAN | 458 |
| NULL | NULL | SUR | 489 |
+--------+----------+--------+----------+
6 rows in set (0.00 sec)
mysql> select capital.cap_no,capital.cap_name,state.capital,state.state_no
from
capital left join state on capital.cap_no=state.state_no union
selectcapital.cap_no,capital.cap_name,state.capital,state.state_no from
capital
right join state on capital.cap_no=state.state_no;
+--------+----------+--------+----------+
| cap_no | cap_name | capital | state_no |
+--------+----------+--------+----------+
| 1 | MH | NULL | NULL |
| 2 | RAJ | NULL | NULL |
| 3 | GOA | NULL | NULL |
| 4 | GUJ | NULL | NULL |
| 5 | KAR | BHO | 5 |
| NULL | NULL | PAN | 46 |
| NULL | NULL | JAI | 58 |
| NULL | NULL | MUM | 78 |
| NULL | NULL | BAN | 458 |
| NULL | NULL | SUR | 489 |
+--------+----------+--------+----------+
```



```
10 rows in set (0.00 sec)
mysql> select * from capital c1, state s1 where c1.cap_no=s1.state_no;
+--------+----------+----------+----------+------------
+------------+---------+
| cap_no | cap_name | state_no | state_no | state_name |
state_code | capital |
+--------+----------+----------+----------+------------
+------------+---------+
|
5 | KAR
5 | BHO
|
|
5 |
5 | MP
|
+--------+----------+----------+----------+------------
+------------+---------+
1 row in set (0.00 sec)
mysql> select * from capital c1, state s1 where c1.cap_no! =s1.state_no;
+--------+----------+----------+----------+------------
+------------+---------+
| cap_no | cap_name | state_no | state_no | state_name |
state_code | capital |
+--------+----------+----------+----------+------------
+------------+---------+
|
1 | MH
5 | BHO
| | 1 | 5 | MP |
|
2 | RAJ
5 | BHO
| | 2 | 5 | MP |
|
3 | GOA
5 | BHO
| | 3 | 5 | MP |
|
4 | GUJ
```

```
5 | BHO
| | 4 | 5 | MP |
|
1 | MH
3 | PAN
| | 1 | 46 | GOA |
|
2 | RAJ
3 | PAN
| | 2 | 46 | GOA |
|
3 | GOA
3 | PAN
| | 3 | 46 | GOA |
|
4 | GUJ
3 | PAN
| | 4 | 46 | GOA |
|
5 | KAR
3 | PAN
| | 5 | 46 | GOA |
|
1 | MH
2 | JAI
| | 1 | 58 | RAJ |
|
2 | RAJ
2 | JAI
| | 2 | 58 | RAJ |
|
3 | GOA
2 | JAI
| | 3 | 58 | RAJ |
|
4 | GUJ
2 | JAI
| | 4 | 58 | RAJ |
|
5 | KAR
```



```
2 | JAI
| | 5 | 58 | RAJ |
|
1 | MH
1 | MUM
| | 1 | 78 | MH |
|
2 | RAJ
1 | MUM
| | 2 | 78 | MH ||
3 | GOA
1 | MUM
| | 3 | 78 | MH |
|
4 | GUJ
1 | MUM
| | 4 | 78 | MH |
|
5 | KAR
1 | MUM
| | 5 | 78 | MH |
|
1 | MH
5 | BAN
| | 1 | 458 | KAR |
|
2 | RAJ
5 | BAN
| | 2 | 458 | KAR |
|
3 | GOA
5 | BAN
| | 3 | 458 | KAR |
|
4 | GUJ
5 | BAN
| | 4 | 458 | KAR |
|
5 | KAR
5 | BAN
```

```
| | 5 | 458 | KAR |
|
1 | MH
4 | SUR
| | 1 | 489 | GUJ |
|
2 | RAJ
4 | SUR
| | 2 | 489 | GUJ |
|
3 | GOA
4 | SUR
| | 3 | 489 | GUJ |
|
4 | GUJ
4 | SUR
| | 4 | 489 | GUJ |
|
5 | KAR
4 | SUR
| | 5 | 489 | GUJ |
+--------+----------+----------+----------+------------
+------------+---------+
29 rows in set (0.00 sec)
mysql> select * from state where state_no=(select state_no from state
where
state_name='MH');
+----------+------------+------------+---------+
| state_no | state_name | state_code | capital |
+----------+------------+------------+---------+
|
78 | MH
|
1 | MUM
|
+----------+------------+------------+---------+
1 row in set (0.06 sec)
mysql> select * from state where state_no=(select state_no from state
where
state_name='GUJ');
```

```
+----------+-----------+-----------+---------+
| state_no | state_name | state_code | capital |
+----------+-----------+-----------+---------+
|
489 | GUJ
|
4 | SUR
|
+----------+-----------+-----------+---------+
1 row in set (0.00 sec)
mysql> select * from state where state_no=(select capital.state_no from
capital
where cap_name='MH');
Empty set (0.00 sec)
mysql> select * from state where state_no=(select capital.state_no from
capital
where cap_name='GUJ');
Empty set (0.00 sec)
mysql> select * from state where state_no=(select capital.state_no from
capital
where cap_name='RAJ');
Empty set (0.00 sec)
mysql> select * from state where state_no=(select capital.state_no from
capital
where cap_name='KAR');
+----------+-----------+-----------+---------+
| state_no | state_name | state_code | capital |
+----------+-----------+-----------+---------+
|
5 | MP
|
5 | BHO
|
+----------+-----------+-----------+---------+
1 row in set (0.00 sec)
```

Conclusion :- Thus,we have successfully studied Joins, Subqueries and views and implemented SQL Queries.