

Lesson 02 Demo 04

Implementing Joins on Tables

Objective: To demonstrate various Table Joins (inner join, left join, right join, full outer join) between the tables in the MySQL database to combine data effectively

Tools Required: Visual Studio Code and MySQL

Prerequisites: None

Steps to be followed:

1. Implement different types of table joins

Step 1: Implement different types of table joins

- 1.1 Execute the following command to display the tables in the **estore** database:

use estore;

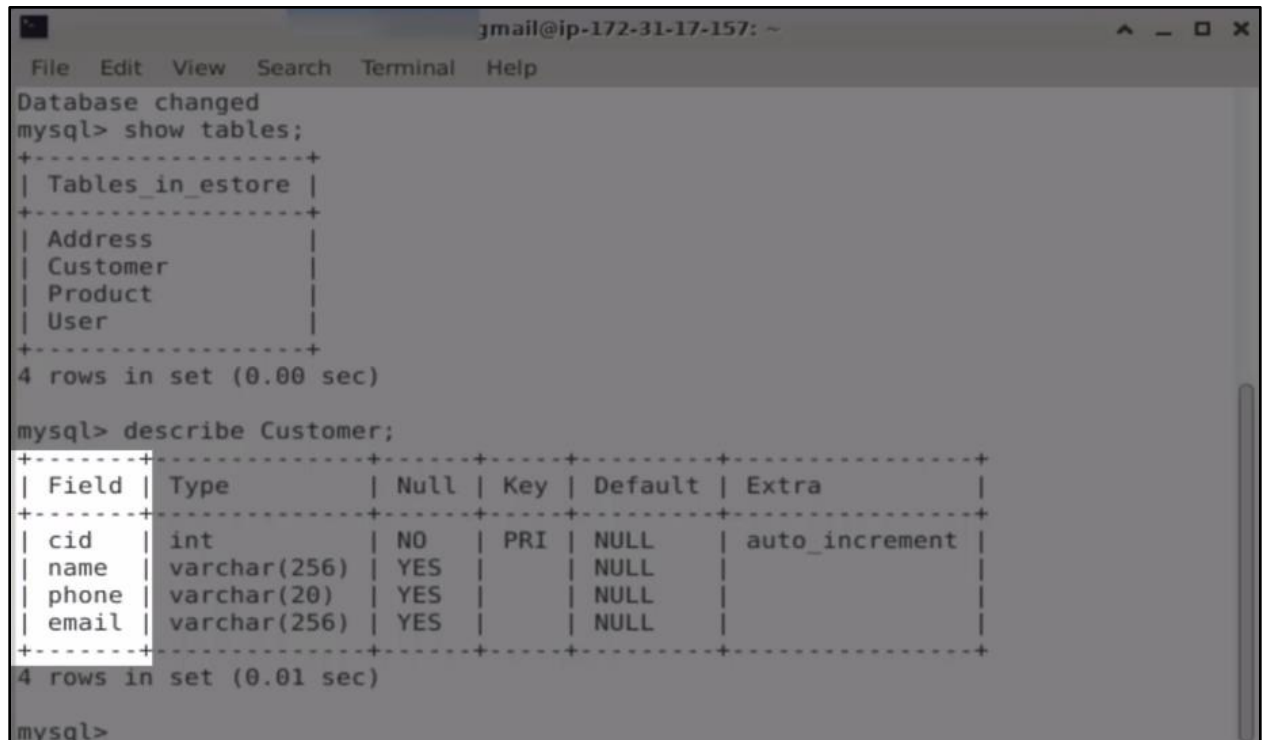
show tables;

```
mysql> use estore;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> show tables;
+-----+
| Tables_in_estore |
+-----+
| Address          |
| Customer         |
| Product          |
| User             |
+-----+
4 rows in set (0.00 sec)

mysql>
```

- 1.2 Execute the following command to describe the **Customer** table to view its structure:
describe Customer;

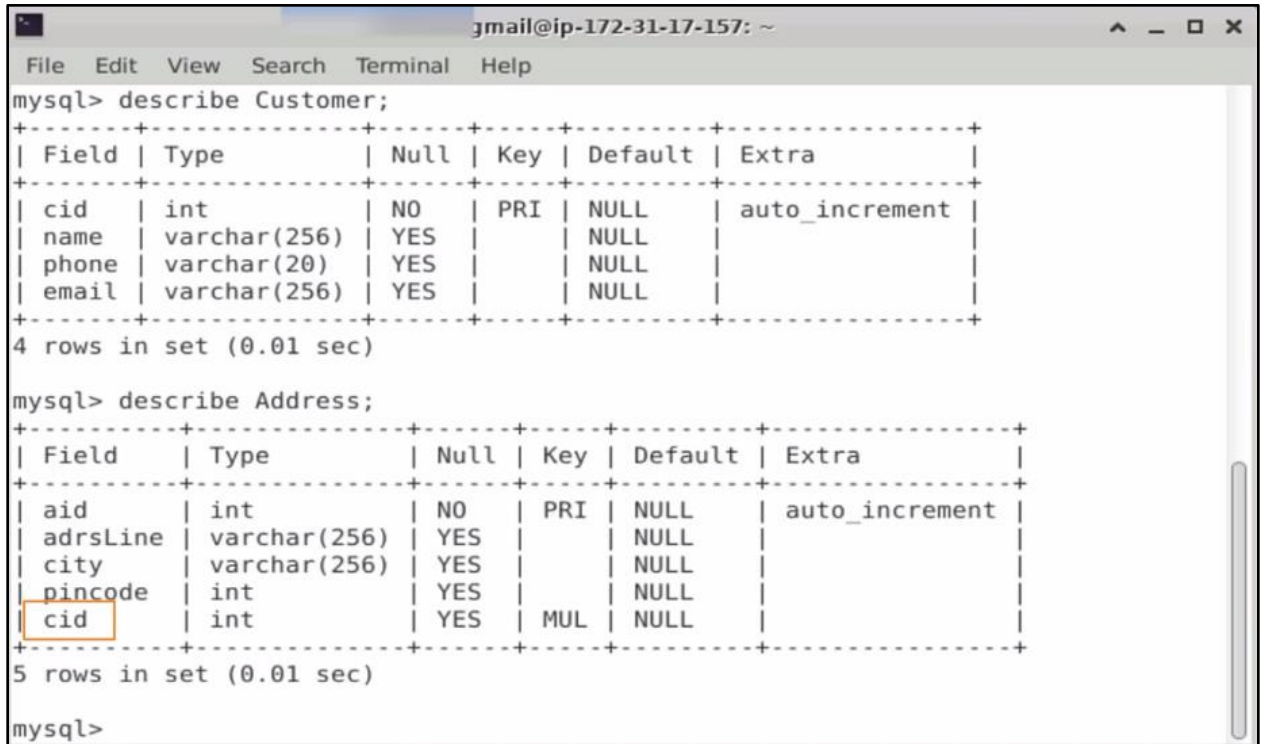


```
gmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
Database changed  
mysql> show tables;  
+-----+  
| Tables_in_estore |  
+-----+  
| Address          |  
| Customer         |  
| Product          |  
| User             |  
+-----+  
4 rows in set (0.00 sec)  
  
mysql> describe Customer;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type          | Null | Key | Default | Extra          |  
+-----+-----+-----+-----+-----+-----+  
| cid   | int           | NO   | PRI | NULL    | auto_increment |  
| name  | varchar(256)  | YES  |     | NULL    |                |  
| phone | varchar(20)   | YES  |     | NULL    |                |  
| email | varchar(256)  | YES  |     | NULL    |                |  
+-----+-----+-----+-----+-----+-----+  
4 rows in set (0.01 sec)  
  
mysql>
```

The columns in the **Customer** table are: **cid**, **name**, **phone**, and **email**.

1.3 Describe the **Address** table to view its structure:

describe Address;



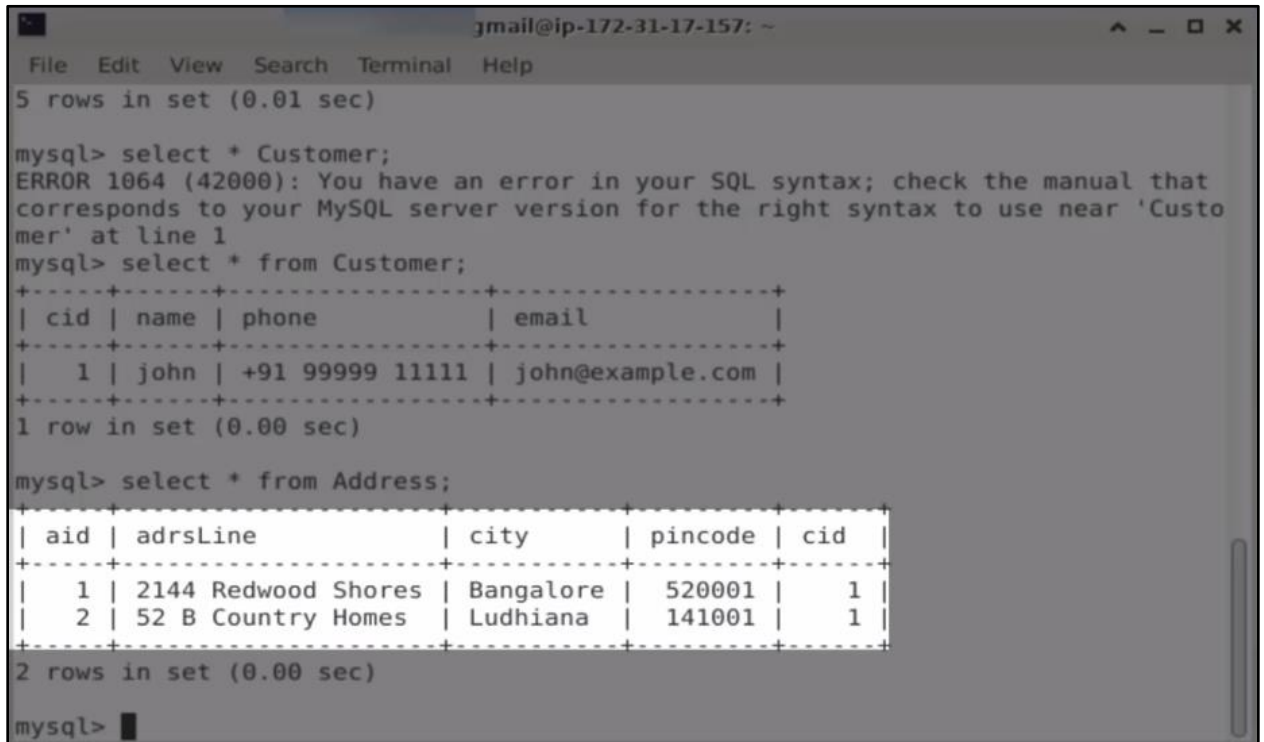
```
gmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
mysql> describe Customer;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type          | Null | Key | Default | Extra          |  
+-----+-----+-----+-----+-----+-----+  
| cid   | int           | NO   | PRI | NULL    | auto_increment |  
| name  | varchar(256)  | YES  |     | NULL    |                |  
| phone | varchar(20)   | YES  |     | NULL    |                |  
| email | varchar(256)  | YES  |     | NULL    |                |  
+-----+-----+-----+-----+-----+-----+  
4 rows in set (0.01 sec)  
  
mysql> describe Address;  
+-----+-----+-----+-----+-----+-----+  
| Field      | Type          | Null | Key | Default | Extra          |  
+-----+-----+-----+-----+-----+-----+  
| aid        | int           | NO   | PRI | NULL    | auto_increment |  
| adrsLine   | varchar(256)  | YES  |     | NULL    |                |  
| city       | varchar(256)  | YES  |     | NULL    |                |  
| pincode    | int           | YES  |     | NULL    |                |  
| cid        | int           | YES  | MUL | NULL    |                |  
+-----+-----+-----+-----+-----+-----+  
5 rows in set (0.01 sec)  
  
mysql>
```

The Address table has a foreign key column: cid.

1.4 Execute the following command to retrieve data from both tables:

```
select * from Customer;
```

```
select * from Address;
```



A terminal window titled 'gmail@ip-172-31-17-157: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following sequence of commands and outputs:

```
5 rows in set (0.01 sec)

mysql> select * Customer;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that
corresponds to your MySQL server version for the right syntax to use near 'Custo
mer' at line 1
mysql> select * from Customer;
+-----+-----+-----+-----+
| cid | name | phone          | email          |
+-----+-----+-----+-----+
| 1 | john | +91 99999 1111 | john@example.com |
+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> select * from Address;
+-----+-----+-----+-----+-----+
| aid | adrsLine          | city       | pincode | cid |
+-----+-----+-----+-----+-----+
| 1 | 2144 Redwood Shores | Bangalore | 520001 | 1 |
| 2 | 52 B Country Homes | Ludhiana | 141001 | 1 |
+-----+-----+-----+-----+-----+
2 rows in set (0.00 sec)

mysql>
```

1.5 Add more data to the **Customer** tables using the following commands:

Insert into Customer values (null, 'fionna', '+91 99999 22222', 'fionna@example.com');

Insert into Customer values (null, 'harry', '+91 99999 34567', 'harry@example.com');

Insert into Customer values (null, 'george', '+91 99999 12345',
'george@example.com');

Insert into Customer values (null, 'sia', '+91 99999 77777', 'sia@example.com');

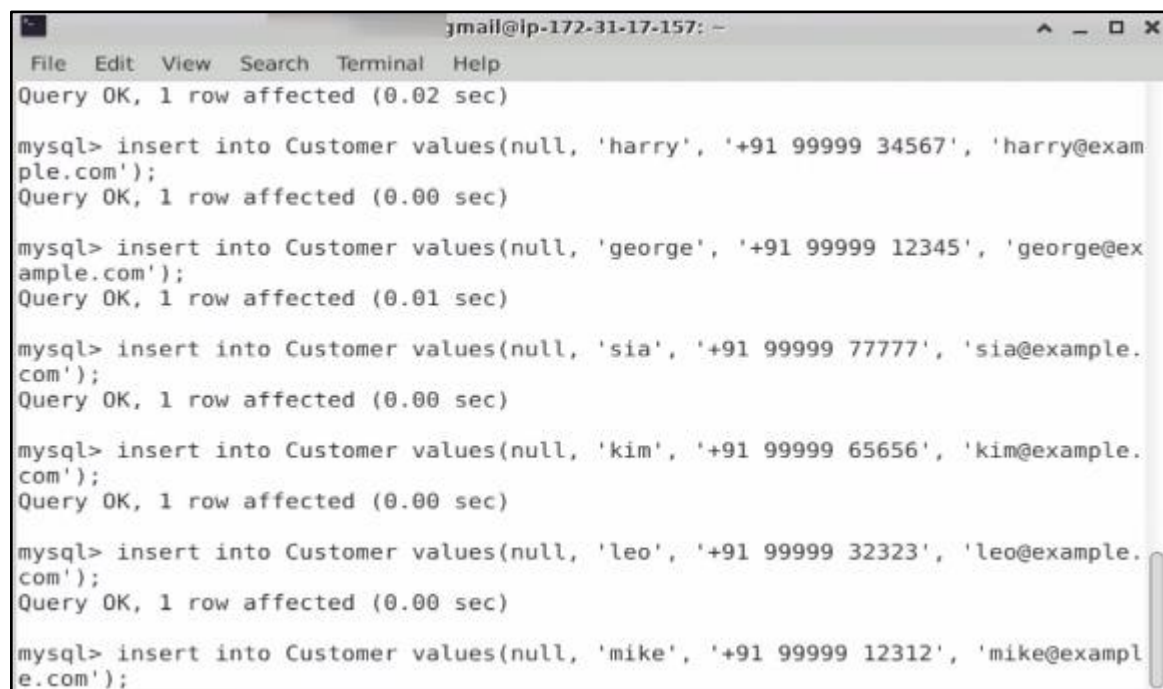
Insert into Customer values (null, 'kim', '+91 99999 65656', 'kim@example.com');

Insert into Customer values (null, 'leo', '+91 99999 32323', 'leo@example.com');

Insert into Customer values (null, 'mike', '+91 99999 12312', 'mike@example.com');

```
insert into Customer values(null, 'fionna', '+91 99999 22222', 'fionna@example.com');
insert into Customer values(null, 'harry', '+91 99999 34567', 'harry@example.com');
insert into Customer values(null, 'george', '+91 99999 12345', 'george@example.com');
insert into Customer values(null, 'sia', '+91 99999 77777', 'sia@example.com');
insert into Customer values(null, 'kim', '+91 99999 65656', 'kim@example.com');
insert into Customer values(null, 'leo', '+91 99999 32323', 'leo@example.com');
insert into Customer values(null, 'mike', '+91 99999 12312', 'mike@example.com');
```

1.6 Copy and paste the commands into the SQL window and execute them to insert the data



The screenshot shows a terminal window titled 'jmail@ip-172-31-17-157: ~'. The terminal displays a series of MySQL commands and their outputs. The commands are: 'insert into Customer values(null, 'harry', '+91 99999 34567', 'harry@example.com');', 'insert into Customer values(null, 'george', '+91 99999 12345', 'george@example.com');', 'insert into Customer values(null, 'sia', '+91 99999 77777', 'sia@example.com');', 'insert into Customer values(null, 'kim', '+91 99999 65656', 'kim@example.com');', 'insert into Customer values(null, 'leo', '+91 99999 32323', 'leo@example.com');', and 'insert into Customer values(null, 'mike', '+91 99999 12312', 'mike@example.com');'. Each command is followed by the output 'Query OK, 1 row affected (0.00 sec)'.

```
jmail@ip-172-31-17-157: ~
File Edit View Search Terminal Help
Query OK, 1 row affected (0.02 sec)

mysql> insert into Customer values(null, 'harry', '+91 99999 34567', 'harry@example.com');
Query OK, 1 row affected (0.00 sec)

mysql> insert into Customer values(null, 'george', '+91 99999 12345', 'george@example.com');
Query OK, 1 row affected (0.01 sec)

mysql> insert into Customer values(null, 'sia', '+91 99999 77777', 'sia@example.com');
Query OK, 1 row affected (0.00 sec)

mysql> insert into Customer values(null, 'kim', '+91 99999 65656', 'kim@example.com');
Query OK, 1 row affected (0.00 sec)

mysql> insert into Customer values(null, 'leo', '+91 99999 32323', 'leo@example.com');
Query OK, 1 row affected (0.00 sec)

mysql> insert into Customer values(null, 'mike', '+91 99999 12312', 'mike@example.com');
```

1.7 Retrieve all data from the **Customer** table using the command:

select * from Customer;

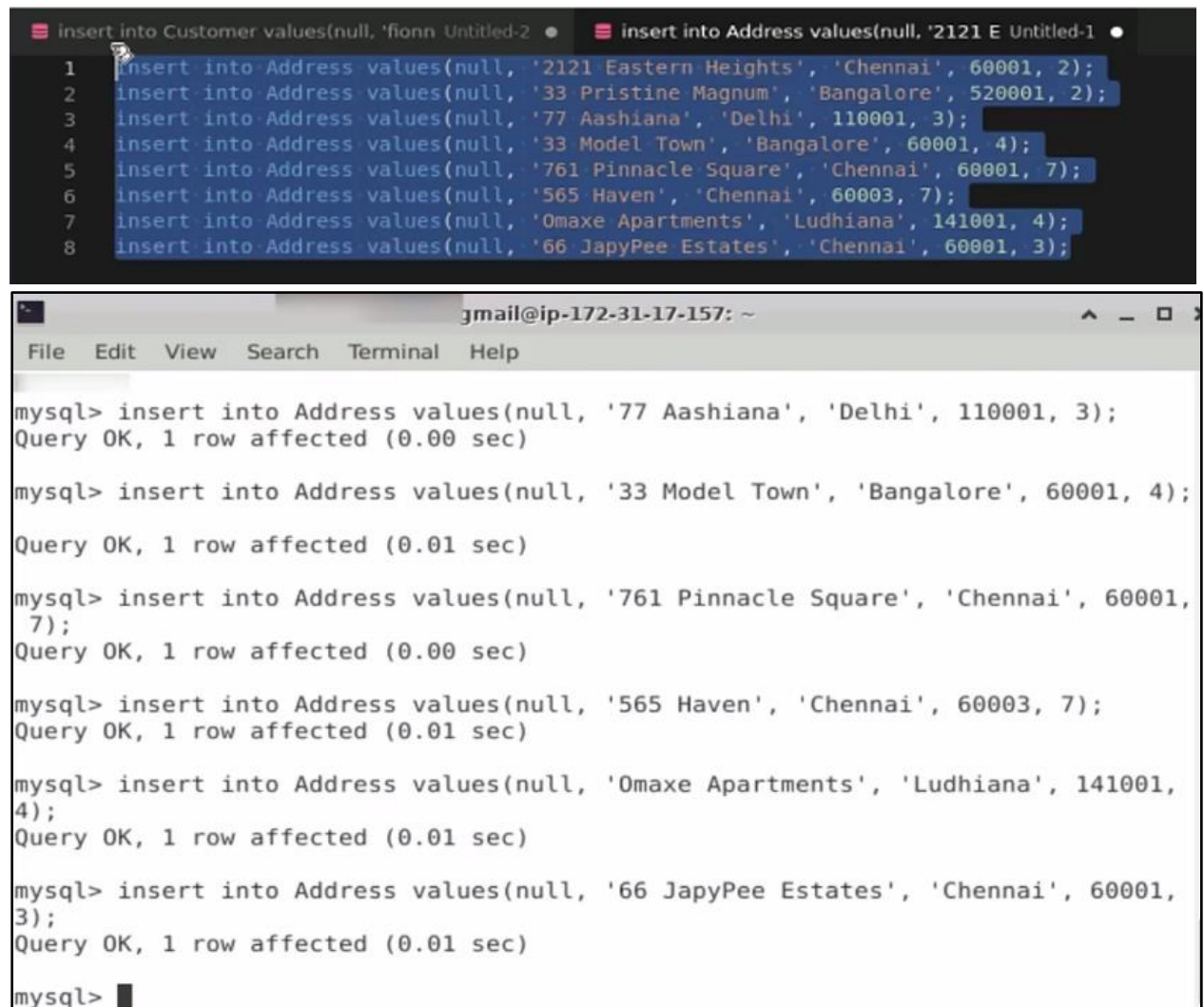


```
jmail@jp-172-31-17-157: ~  
File Edit View Search Terminal Help  
mysql> insert into Customer values(null, 'mike', '+91 99999 12312', 'mike@example.com');  
Query OK, 1 row affected (0.00 sec)  
  
mysql> select * form Customer;  
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'form Customer' at line 1  
mysql> select * from Customer;  
+----+-----+-----+-----+  
| cid | name  | phone      | email                |  
+----+-----+-----+-----+  
| 1   | john  | +91 99999 11111 | john@example.com     |  
| 2   | fionna | +91 99999 22222 | fionna@example.com   |  
| 3   | harry  | +91 99999 34567 | harry@example.com    |  
| 4   | george | +91 99999 12345 | george@example.com   |  
| 5   | sia    | +91 99999 77777 | sia@example.com       |  
| 6   | kim    | +91 99999 65656 | kim@example.com       |  
| 7   | leo    | +91 99999 32323 | leo@example.com       |  
| 8   | mike   | +91 99999 12312 | mike@example.com      |  
+----+-----+-----+-----+  
8 rows in set (0.00 sec)  
  
mysql>
```

An expanded dataset in the table will be visible as above.

1.8 Copy and paste the provided addresses for customers into the SQL window to insert the data into the **Address** table:

```
Insert into Address values (null, '2121 Eastern Heights', 'Chennai', 60001, 2);
Insert into Address values (null, '33 Pristine Magnum', 'Bangalore', 520001, 2);
Insert into Address values (null, '77 Aashiana', 'Delhi', 110001, 3);
Insert into Address values (null, '33 Model Town', 'Bangalore', 60001, 4);
Insert into Address values (null, '761 Pinnacle Square', 'Chennai', 60601, 7);
Insert into Address values (null, '565 Haven', 'Chennai', 60003, 7);
Insert into Address values (null, 'Omaxe Apartments', 'Ludhiana', 141001, 4);
Insert into Address values (null, '66 JayPee Estates', 'Chennai', 60001, 3);
```



The image shows a code editor window at the top with a dark theme, containing eight lines of SQL insert statements for the 'Address' table. Below it is a terminal window titled 'gmail@ip-172-31-17-157: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the execution of six of these statements, each resulting in 'Query OK, 1 row affected'.

```
mysql> insert into Address values(null, '77 Aashiana', 'Delhi', 110001, 3);
Query OK, 1 row affected (0.00 sec)

mysql> insert into Address values(null, '33 Model Town', 'Bangalore', 60001, 4);
Query OK, 1 row affected (0.01 sec)

mysql> insert into Address values(null, '761 Pinnacle Square', 'Chennai', 60001, 7);
Query OK, 1 row affected (0.00 sec)

mysql> insert into Address values(null, '565 Haven', 'Chennai', 60003, 7);
Query OK, 1 row affected (0.01 sec)

mysql> insert into Address values(null, 'Omaxe Apartments', 'Ludhiana', 141001, 4);
Query OK, 1 row affected (0.01 sec)

mysql> insert into Address values(null, '66 JapyPee Estates', 'Chennai', 60001, 3);
Query OK, 1 row affected (0.01 sec)

mysql>
```


1.9 Retrieve all data from the **Address** table using the command:

select * from Address;

```

mysql> insert into Address values(null, '66 JapyPee Estates', 'Chennai', 60001, 3);
Query OK, 1 row affected (0.01 sec)

mysql> select * from Address;
+-----+-----+-----+-----+-----+
| aid | adrsLine | city | pincode | cid |
+-----+-----+-----+-----+-----+
| 1 | 2144 Redwood Shores | Bangalore | 520001 | 1 |
| 2 | 52 B Country Homes | Ludhiana | 141001 | 1 |
| 3 | 2121 Eastern Heights | Chennai | 60001 | 2 |
| 4 | 33 Pristine Magnum | Bangalore | 520001 | 2 |
| 5 | 77 Aashiana | Delhi | 110001 | 3 |
| 6 | 33 Model Town | Bangalore | 60001 | 4 |
| 7 | 761 Pinnacle Square | Chennai | 60001 | 7 |
| 8 | 565 Haven | Chennai | 60003 | 7 |
| 9 | Omaxe Apartments | Ludhiana | 141001 | 4 |
| 10 | 66 JapyPee Estates | Chennai | 60001 | 3 |
+-----+-----+-----+-----+-----+
10 rows in set (0.00 sec)

mysql>

```

1.10 Since the tables are related, you can merge them using Joins to retrieve data. For an Inner Join, which delivers matching records from both tables, the query can be written as follows:

Select Customer.name, Customer.phone, Address.adrsLine, Address.city

From Customer

Inner Join Address on Custome.cid = Address.cid;

```

insert into Customer values(null, 'fionn', 'Untitled-2')
insert into Address values(null, '2121 E', 'Untitled-1')

1 select Customer.name, Customer.phone, Address.adrsLine, Address.city
2 from Customer
3 Inner Join Address on Customer.cid = Address.cid;

```


1.11 Copy and paste the query into the SQL window to see the results

```

gmail@ip-172-31-17-157: ~
File Edit View Search Terminal Help
| 10 | 66 JapyPee Estates | Chennai | 60001 | 3 |
+-----+-----+-----+-----+
10 rows in set (0.00 sec)

mysql> select Customer.name, Customer.phone, Address.adrsLine, Address.city
-> from Customer
-> Inner Join Address on Customer.cid = Address.cid;
+-----+-----+-----+-----+
| name | phone | adrsLine | city |
+-----+-----+-----+-----+
| john | +91 99999 11111 | 2144 Redwood Shores | Bangalore |
| john | +91 99999 11111 | 52 B Country Homes | Ludhiana |
| fionna | +91 99999 22222 | 2121 Eastern Heights | Chennai |
| fionna | +91 99999 22222 | 33 Pristine Magnum | Bangalore |
| harry | +91 99999 34567 | 77 Aashiana | Delhi |
| george | +91 99999 12345 | 33 Model Town | Bangalore |
| leo | +91 99999 32323 | 761 Pinnacle Square | Chennai |
| leo | +91 99999 32323 | 565 Haven | Chennai |
| george | +91 99999 12345 | Omaxe Apartments | Ludhiana |
| harry | +91 99999 34567 | 66 JapyPee Estates | Chennai |
+-----+-----+-----+-----+
10 rows in set (0.00 sec)

```

You will notice that some customers have two addresses, while others have only one.

1.12 Now, let's use Left Join to fetch all records from the left table (Customer), as well as the corresponding records from the right table (Address). Execute the below query:

```

Select Customer.name, Customer.phone, Address.adrsLine, Address.city
from Customer
Left JOIN Address ON Customer.cid = Address.cid
Order By Customer.name;

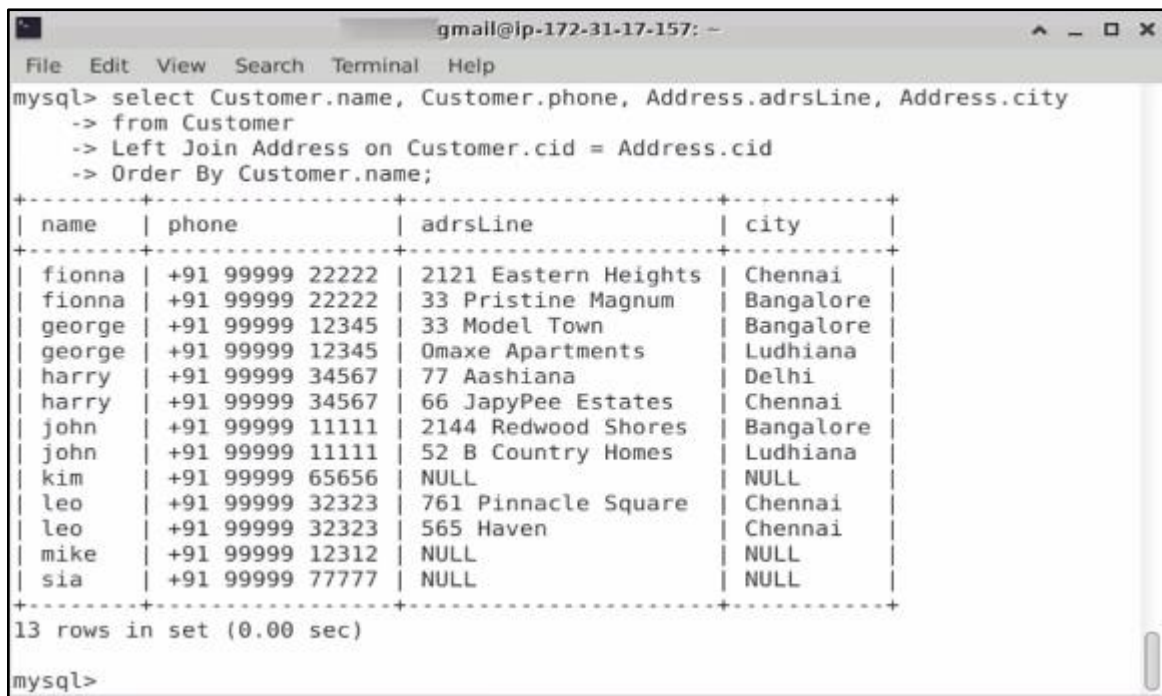
```

```

select Customer.name, Customer.phone, Address.adrsLine, Address.city
from Customer
Left Join Address on Customer.cid = Address.cid;
Order By Customer.name;

```

1.13 Copy and paste the query into the SQL window and execute it



```

mysql> select Customer.name, Customer.phone, Address.adrsLine, Address.city
-> from Customer
-> Left Join Address on Customer.cid = Address.cid
-> Order By Customer.name;
+-----+-----+-----+-----+
| name | phone | adrsLine | city |
+-----+-----+-----+-----+
| fionna | +91 99999 22222 | 2121 Eastern Heights | Chennai |
| fionna | +91 99999 22222 | 33 Pristine Magnum | Bangalore |
| george | +91 99999 12345 | 33 Model Town | Bangalore |
| george | +91 99999 12345 | Omaxe Apartments | Ludhiana |
| harry | +91 99999 34567 | 77 Aashiana | Delhi |
| harry | +91 99999 34567 | 66 JapyPee Estates | Chennai |
| john | +91 99999 11111 | 2144 Redwood Shores | Bangalore |
| john | +91 99999 11111 | 52 B Country Homes | Ludhiana |
| kim | +91 99999 65656 | NULL | NULL |
| leo | +91 99999 32323 | 761 Pinnacle Square | Chennai |
| leo | +91 99999 32323 | 565 Haven | Chennai |
| mike | +91 99999 12312 | NULL | NULL |
| sia | +91 99999 77777 | NULL | NULL |
+-----+-----+-----+-----+
13 rows in set (0.00 sec)

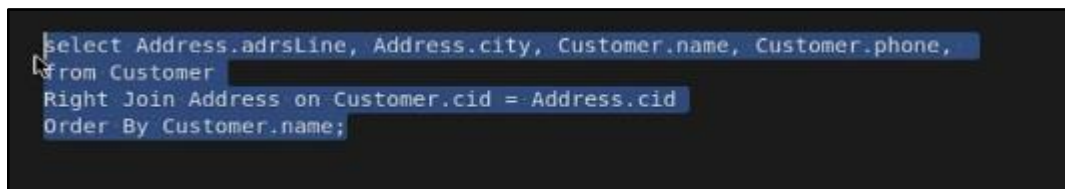
mysql>

```

You will see that data is fetched from the left table (**Customer**) while the unmatched data from the right table (**Address**) is displayed as **NULL**.

1.14 To perform a **Right Join** from the **Customer** table, update the query as shown below:

Select Address.adrsLine, Address.city, Customer.name, Customer.phone
from Customer
RIGHT Join Address ON Customer.cid = Address.cid
Order By Customer.name;



```

Select Address.adrsLine, Address.city, Customer.name, Customer.phone,
from Customer
Right Join Address on Customer.cid = Address.cid
Order By Customer.name;

```

1.15 Copy and paste the updated query into the SQL window

```

gmail@ip-172-31-17-157: ~
File Edit View Search Terminal Help
Customer
Right Join Address on Customer.cid = Address.cid
Order By Customer' at line 2
mysql> select Address.adrsLine, Address.city, Customer.name, Customer.phone
-> from Customer
-> Right Join Address on Customer.cid = Address.cid
-> Order By Customer.name;
+-----+-----+-----+-----+
| adrsLine | city | name | phone |
+-----+-----+-----+-----+
| 2121 Eastern Heights | Chennai | fionna | +91 99999 22222 |
| 33 Pristine Magnum | Bangalore | fionna | +91 99999 22222 |
| 33 Model Town | Bangalore | george | +91 99999 12345 |
| Omaxe Apartments | Ludhiana | george | +91 99999 12345 |
| 77 Aashiana | Delhi | harry | +91 99999 34567 |
| 66 JapyPee Estates | Chennai | harry | +91 99999 34567 |
| 2144 Redwood Shores | Bangalore | john | +91 99999 11111 |
| 52 B Country Homes | Ludhiana | john | +91 99999 11111 |
| 761 Pinnacle Square | Chennai | leo | +91 99999 32323 |
| 565 Haven | Chennai | leo | +91 99999 32323 |
+-----+-----+-----+-----+
10 rows in set (0.00 sec)

mysql>

```

Now, all the records coming from the right table (**Address**) will be available.

1.16 Finally, implement a **Full Outer Join** to retrieve records from both tables. Write the query as follows:

```

Select Customer.name, Customer.phone, Address.adrsLine, Address.city
from Customer
FULL OUTER JOIN Address on Customer.cid = Address.cid
Order By Customer.name;

```

```

select Customer.name, Customer.phone, Address.adrsLine, Address.city
from Customer
FULL OUTER JOIN Address on Customer.cid = Address.cid
Order By Customer.name;

```

By following these steps you have successfully implemented the joins on tables in the MySQL database to combine data effectively.