

## Lesson 02 Demo 02

### Implementing Select Statement with Various Clauses

**Objective:** To demonstrate the usage of Select Statement with various clauses to query and manipulate data in a MySQL database

**Tools Required:** MySQL

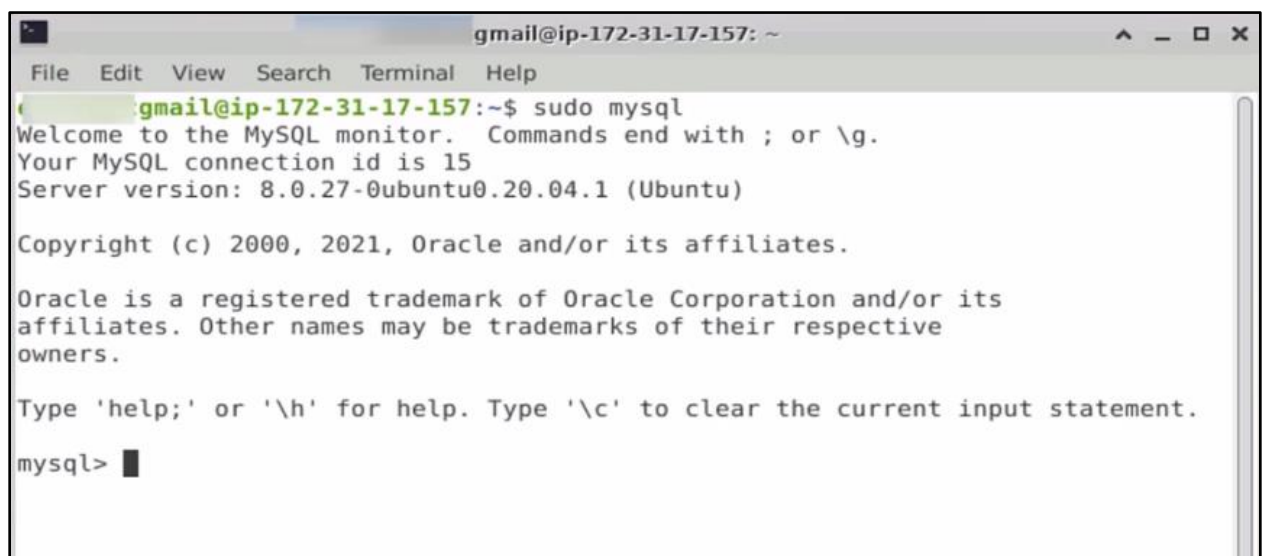
**Prerequisites:** None

#### Steps to be followed:

1. Access and explore the database
2. Query and manipulating data
3. Query with advanced techniques

#### Step 1: Access and explore the database

- 1.1 Open the terminal window and type **sudo mysql**



```
gmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
gmail@ip-172-31-17-157:~$ sudo mysql  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 15  
Server version: 8.0.27-0ubuntu0.20.04.1 (Ubuntu)  
  
Copyright (c) 2000, 2021, Oracle and/or its affiliates.  
  
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affiliates. Other names may be trademarks of their respective  
owners.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql>
```

- 1.2 Execute the following command to change the database to **estore**  
Use **estore**;

```
gmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
gmail@ip-172-31-17-157:~$ sudo mysql  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 15  
Server version: 8.0.27-0ubuntu0.20.04.1 (Ubuntu)  
  
Copyright (c) 2000, 2021, Oracle and/or its affiliates.  
  
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affiliates. Other names may be trademarks of their respective  
owners.  
  
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
  
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>
```

- 1.3 Execute the following command to display the existing tables:  
**show tables;**

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

1.4 Execute the query **select \* from User;**

```
gmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
2 rows in set (0.00 sec)  
  
mysql> select * from User;  
+-----+-----+-----+-----+  
| uid | name | phone | email |  
+-----+-----+-----+-----+  
| 1 | john | +91 9999911111 | john@example.com |  
| 2 | fionna | +91 9999922222 | fionna@example.com |  
| 4 | mike | +91 9090910101 | mike@example.com |  
+-----+-----+-----+-----+  
3 rows in set (0.00 sec)
```

1.5 Check the current structure of the table using the **describe** query  
**describe User;**

```
mysql> describe User;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type | Null | Key | Default | Extra |  
+-----+-----+-----+-----+-----+-----+  
| uid | int | NO | PRI | NULL | auto_increment |  
| name | varchar(256) | YES | | NULL | |  
| phone | varchar(16) | YES | | NULL | |  
| email | varchar(256) | NO | | NULL | |  
+-----+-----+-----+-----+-----+-----+  
4 rows in set (0.00 sec)
```

1.6 Alter the columns in the **User** table:

**alter table User add age int default 26;**

```
mysql> describe User;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra           |
+-----+-----+-----+-----+-----+-----+
| uid   | int           | NO   | PRI | NULL    | auto_increment |
| name  | varchar(256)  | YES  |     | NULL    |                 |
| phone | varchar(16)   | YES  |     | NULL    |                 |
| email | varchar(256)  | NO   |     | NULL    |                 |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.00 sec)

mysql> alter table User add age int default 26
-> ;
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0
```

1.7 **Describe** the table again to see the updated structure

**describe User;**

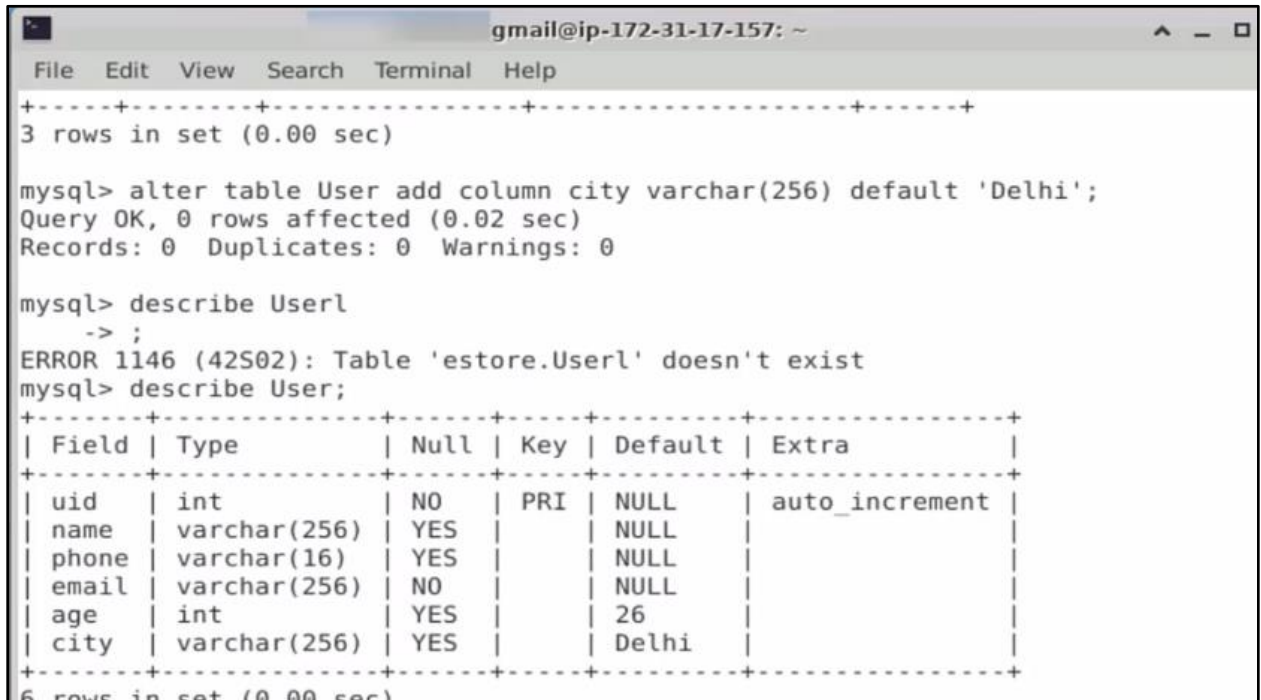
```
mysql> alter table User add age int default 26
-> ;
Query OK, 0 rows affected (0.04 sec)
Records: 0 Duplicates: 0 Warnings: 0

mysql> describe User;
+-----+-----+-----+-----+-----+-----+
| Field | Type          | Null | Key | Default | Extra           |
+-----+-----+-----+-----+-----+-----+
| uid   | int           | NO   | PRI | NULL    | auto_increment |
| name  | varchar(256)  | YES  |     | NULL    |                 |
| phone | varchar(16)   | YES  |     | NULL    |                 |
| email | varchar(256)  | NO   |     | NULL    |                 |
| age   | int           | YES  |     | 26      |                 |
+-----+-----+-----+-----+-----+-----+
5 rows in set (0.00 sec)
```

1.8 Add a new column called **city** to the table and set the default value as **Delhi**:

```
alter table User add column city varchar(256) default 'Delhi';
```

```
describe User;
```



The screenshot shows a terminal window with the following content:

```
gmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
+-----+-----+-----+-----+-----+-----+  
3 rows in set (0.00 sec)  
  
mysql> alter table User add column city varchar(256) default 'Delhi';  
Query OK, 0 rows affected (0.02 sec)  
Records: 0 Duplicates: 0 Warnings: 0  
  
mysql> describe Userl  
-> ;  
ERROR 1146 (42S02): Table 'estore.Userl' doesn't exist  
mysql> describe User;  
+-----+-----+-----+-----+-----+-----+  
| Field | Type          | Null | Key | Default | Extra          |  
+-----+-----+-----+-----+-----+-----+  
| uid   | int           | NO   | PRI | NULL    | auto_increment |  
| name  | varchar(256)  | YES  |     | NULL    |                |  
| phone | varchar(16)   | YES  |     | NULL    |                |  
| email | varchar(256)  | NO   |     | NULL    |                |  
| age   | int           | YES  |     | 26      |                |  
| city  | varchar(256)  | YES  |     | Delhi   |                |  
+-----+-----+-----+-----+-----+-----+  
5 rows in set (0.00 sec)
```

1.9 Select the data from the **User** table to view the added **city** column:

**select \* from User;**

```
gmail@ip-172-31-17-157: ~
File Edit View Search Terminal Help
+-----+-----+-----+-----+-----+-----+
| Field | Type      | Null | Key | Default | Extra      |
+-----+-----+-----+-----+-----+-----+
| uid   | int       | NO   | PRI | NULL    | auto_increment |
| name  | varchar(256) | YES  |     | NULL    |              |
| phone | varchar(16) | YES  |     | NULL    |              |
| email | varchar(256) | NO   |     | NULL    |              |
| age   | int       | YES  |     | 26      |              |
| city  | varchar(256) | YES  |     | Delhi   |              |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)

mysql> select * from user;
ERROR 1146 (42S02): Table 'estore.user' doesn't exist
mysql> select * from User;
+-----+-----+-----+-----+-----+-----+
| uid | name  | phone      | email              | age | city  |
+-----+-----+-----+-----+-----+-----+
| 1   | john  | +91 9999911111 | john@example.com | 26  | Delhi |
| 2   | fionna | +91 9999922222 | fionna@example.com | 26  | Delhi |
| 4   | mike  | +91 9090910101 | mike@example.com | 26  | Delhi |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

## Step 2: Query and manipulate the data

2.1 **Insert** a few more records into the table using the following commands:

```
insert into User values(null, 'sia', '+91 9999922222', 'sia@example.com', 23, 'Bangalore');
insert into User values(null, 'kim', '+91 9999933333', 'kim@example.com', 27, 'Bangalore');
insert into User values(null, 'george', '+91 9999955555', 'george@example.com', 31, 'Bangalore');
insert into User values(null, 'harry', '+91 9999965432', 'harry@example.com', 33, 'Chenna');
insert into User values(null, 'noa', '+91 9999945678', 'noa@example.com', 31, 'Chenna');
insert into User values(null, 'jacob', '+91 9999964331', 'jacob@example.com', 32, 'Chennai');
```

## 2.2 Run the commands in the MySQL window

```
nail@ip-172-31-17-157: ~
File Edit View Search Terminal Help
31, 'Chenna');
Query OK, 1 row affected (0.01 sec)

mysql> insert into User values(null, 'jacob', '+91 9999964331', 'jacob@example.com', 32, 'Chennai');
Query OK, 1 row affected (0.01 sec)

mysql> select * from User;
+----+-----+-----+-----+-----+-----+
| uid | name  | phone          | email              | age | city    |
+----+-----+-----+-----+-----+-----+
| 1   | john  | +91 9999911111 | john@example.com   | 26  | Delhi   |
| 2   | fionna | +91 9999922222 | fionna@example.com | 26  | Delhi   |
| 4   | mike  | +91 9090910101 | mike@example.com   | 26  | Delhi   |
| 5   | sia   | +91 9999922222 | sia@example.com     | 23  | Bangalore |
| 6   | kim   | +91 9999933333 | kim@example.com     | 27  | Bangalore |
| 7   | george | +91 9999955555 | george@example.com | 31  | Bangalore |
| 8   | harry  | +91 9999965432 | harry@example.com  | 33  | Chenna  |
| 9   | noa   | +91 9999945678 | noa@example.com     | 31  | Chenna  |
| 10  | jacob  | +91 9999964331 | jacob@example.com  | 32  | Chennai |
+----+-----+-----+-----+-----+-----+
9 rows in set (0.00 sec)
```

## 2.3 Select the name and phone number of the users

```
mysql> select name, phone from User;
+-----+-----+
| name  | phone          |
+-----+-----+
| john  | +91 9999911111 |
| fionna | +91 9999922222 |
| mike  | +91 9090910101 |
| sia   | +91 9999922222 |
| kim   | +91 9999933333 |
| george | +91 9999955555 |
| harry  | +91 9999965432 |
| noa   | +91 9999945678 |
| jacob  | +91 9999964331 |
+-----+-----+
9 rows in set (0.00 sec)
```



## 2.4 Work with the **where** clause to filter records based on specific conditions

```
nail@ip-172-31-17-157: ~
File Edit View Search Terminal Help

+-----+
| john   | +91 9999911111 |
| fionna | +91 9999922222 |
| mike   | +91 9090910101 |
| sia     | +91 9999922222 |
| kim     | +91 9999933333 |
| george  | +91 9999955555 |
| harry   | +91 9999965432 |
| noa     | +91 9999945678 |
| jacob   | +91 9999964331 |
+-----+
9 rows in set (0.00 sec)

mysql> select * from User where city = 'Bangalore';
+-----+
| uid | name   | phone           | email               | age | city      |
+-----+
| 5   | sia    | +91 9999922222 | sia@example.com     | 23  | Bangalore |
| 6   | kim    | +91 9999933333 | kim@example.com     | 27  | Bangalore |
| 7   | george | +91 9999955555 | george@example.com  | 31  | Bangalore |
+-----+
3 rows in set (0.00 sec)
```

## 2.5 Use logical operators (AND, OR, NOT) to combine multiple conditions

```
mysql> select * from User where city = 'Bangalore' and age > 27;
+-----+
| uid | name   | phone           | email               | age | city      |
+-----+
| 7   | george | +91 9999955555 | george@example.com  | 31  | Bangalore |
+-----+
1 row in set (0.00 sec)
```

```
mysql> select * from User where city = 'Bangalore' or age > 27;
+-----+
| uid | name   | phone           | email               | age | city      |
+-----+
| 5   | sia    | +91 9999922222 | sia@example.com     | 23  | Bangalore |
| 6   | kim    | +91 9999933333 | kim@example.com     | 27  | Bangalore |
| 7   | george | +91 9999955555 | george@example.com  | 31  | Bangalore |
| 8   | harry  | +91 9999965432 | harry@example.com   | 33  | Chenna   |
| 9   | noa    | +91 9999945678 | noa@example.com     | 31  | Chenna   |
| 10  | jacob  | +91 9999964331 | jacob@example.com   | 32  | Chennai  |
+-----+
6 rows in set (0.00 sec)
```



## 2.6 Perform the **order by** operation to sort the results

```
mysql> select * from User order by name;
```

uid	name	phone	email	age	city
2	fionna	+91 9999922222	fionna@example.com	26	Delhi
7	george	+91 9999955555	george@example.com	31	Bangalore
8	harry	+91 9999965432	harry@example.com	33	Chenna
10	jacob	+91 9999964331	jacob@example.com	32	Chennai
1	john	+91 9999911111	john@example.com	26	Delhi
6	kim	+91 9999933333	kim@example.com	27	Bangalore
4	mike	+91 9090910101	mike@example.com	26	Delhi
9	noa	+91 9999945678	noa@example.com	31	Chenna
5	sia	+91 9999922222	sia@example.com	23	Bangalore

9 rows in set (0.00 sec)

```
mysql> select * from User order by name DESC;
```

uid	name	phone	email	age	city
5	sia	+91 9999922222	sia@example.com	23	Bangalore
9	noa	+91 9999945678	noa@example.com	31	Chenna
4	mike	+91 9090910101	mike@example.com	26	Delhi
6	kim	+91 9999933333	kim@example.com	27	Bangalore
1	john	+91 9999911111	john@example.com	26	Delhi
10	jacob	+91 9999964331	jacob@example.com	32	Chennai
8	harry	+91 9999965432	harry@example.com	33	Chenna
7	george	+91 9999955555	george@example.com	31	Bangalore
2	fionna	+91 9999922222	fionna@example.com	26	Delhi

9 rows in set (0.00 sec)

```
mysql> select * from User order by age DESC;
```

uid	name	phone	email	age	city
8	harry	+91 9999965432	harry@example.com	33	Chenna
10	jacob	+91 9999964331	jacob@example.com	32	Chennai
7	george	+91 9999955555	george@example.com	31	Bangalore
9	noa	+91 9999945678	noa@example.com	31	Chenna
6	kim	+91 9999933333	kim@example.com	27	Bangalore
1	john	+91 9999911111	john@example.com	26	Delhi
2	fionna	+91 9999922222	fionna@example.com	26	Delhi
4	mike	+91 9090910101	mike@example.com	26	Delhi
5	sia	+91 9999922222	sia@example.com	23	Bangalore

9 rows in set (0.00 sec)

## 2.7 Use the **group by** clause to aggregate data and determine counts

```
mysql> select count(uid), city from User group by city;
```

count(uid)	city
3	Delhi
3	Bangalore
2	Chenna
1	Chennai

4 rows in set (0.00 sec)

## 2.8 Select a limited number of records using the **limit** clause

```
mysql> select count(uid), city from User group by city;
```

count(uid)	city
3	Delhi
3	Bangalore
2	Chenna
1	Chennai

4 rows in set (0.00 sec)

```
mysql> select * from user Limit 3;
```

ERROR 1146 (42S02): Table 'estore.user' doesn't exist

```
mysql> select * from User Limit 3;
```

uid	name	phone	email	age	city
1	john	+91 9999911111	john@example.com	26	Delhi
2	fionna	+91 9999922222	fionna@example.com	26	Delhi
4	mike	+91 9090910101	mike@example.com	26	Delhi

3 rows in set (0.00 sec)

## 2.9 Use aggregate functions (min, max, sum, avg) to perform calculations on columns

```
tgmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
+-----+  
| min(age) |  
+-----+  
|      23 |  
+-----+  
1 row in set (0.00 sec)  
  
mysql> select min(age), max(age) from User;  
+-----+-----+  
| min(age) | max(age) |  
+-----+-----+  
|      23 |      33 |  
+-----+-----+  
1 row in set (0.00 sec)  
  
mysql> select min(age) as MINAGE, max(age) as MAXAGE from User;  
+-----+-----+  
| MINAGE | MAXAGE |  
+-----+-----+  
|      23 |      33 |  
+-----+-----+  
1 row in set (0.00 sec)
```

## 2.10 Use the count function to determine the number of rows in a table

```
tgmail@ip-172-31-17-157: ~  
File Edit View Search Terminal Help  
+-----+-----+  
| MINAGE | MAXAGE |  
+-----+-----+  
|      23 |      33 |  
+-----+-----+  
1 row in set (0.00 sec)  
  
mysql> select max(uid) from User;  
+-----+  
| max(uid) |  
+-----+  
|       10 |  
+-----+  
1 row in set (0.00 sec)
```

### Step 3: Query with advanced techniques

3.1 Use the **sum** function to calculate the sum of values in a column

```
mysql> select sum(age) from User;
+-----+
| sum(age) |
+-----+
|      255 |
+-----+
1 row in set (0.00 sec)
```

3.2 Use the **sum** function with a condition to calculate the sum based on specific criteria

```
mysql> select sum(age) from User where city = 'Delhi';
+-----+
| sum(age) |
+-----+
|       78 |
+-----+
1 row in set (0.00 sec)
```

3.3 Use the **avg** function to calculate the average value in a column

```
mysql> select avg(age) from User;
+-----+
| avg(age) |
+-----+
|  28.3333 |
+-----+
1 row in set (0.00 sec)
```

### 3.4 Use the **avg** function with a condition to calculate the average based on specific criteria

```
mysql> select avg(age) from User where city = 'Bangalore';
+-----+
| avg(age) |
+-----+
| 27.0000 |
+-----+
1 row in set (0.00 sec)
```

### 3.5 Use the **in** operator to search for specific values

```
mysql> select * from User where city in ('Delhi', 'Bangalore');
+-----+-----+-----+-----+-----+-----+
| uid | name | phone | email | age | city |
+-----+-----+-----+-----+-----+-----+
| 1 | john | +91 9999911111 | john@example.com | 26 | Delhi |
| 2 | fionna | +91 9999922222 | fionna@example.com | 26 | Delhi |
| 4 | mike | +91 9090910101 | mike@example.com | 26 | Delhi |
| 5 | sia | +91 9999922222 | sia@example.com | 23 | Bangalore |
| 6 | kim | +91 9999933333 | kim@example.com | 27 | Bangalore |
| 7 | george | +91 9999955555 | george@example.com | 31 | Bangalore |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

### 3.6 Use the **not in** operator to exclude specific values

```
mysql> select * from User where city not in ('Delhi', 'Bangalore');
+-----+-----+-----+-----+-----+-----+
| uid | name | phone | email | age | city |
+-----+-----+-----+-----+-----+-----+
| 8 | harry | +91 9999965432 | harry@example.com | 33 | Chenna |
| 9 | noa | +91 9999945678 | noa@example.com | 31 | Chenna |
| 10 | jacob | +91 9999964331 | jacob@example.com | 32 | Chennai |
+-----+-----+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```

### 3.7 Use the **between** operator to select values within a range

```
mysql> select * from User where age between 25 and 30;
```

uid	name	phone	email	age	city
1	john	+91 9999911111	john@example.com	26	Delhi
2	fionna	+91 9999922222	fionna@example.com	26	Delhi
4	mike	+91 9090910101	mike@example.com	26	Delhi
6	kim	+91 9999933333	kim@example.com	27	Bangalore

```
4 rows in set (0.00 sec)
```

### 3.8 Use the **like** operator to search for values matching a specific pattern

```
mysql> select * from User where name like 'm%';
```

uid	name	phone	email	age	city
4	mike	+91 9090910101	mike@example.com	26	Delhi

```
1 row in set (0.00 sec)
```

```
mysql> select * from User where name like 'j%';
```

uid	name	phone	email	age	city
1	john	+91 9999911111	john@example.com	26	Delhi
10	jacob	+91 9999964331	jacob@example.com	32	Chennai

```
2 rows in set (0.00 sec)
```

By Following these steps you have successfully implemented the select statement and its clauses, you can effectively retrieve, filter, sort, and aggregate data to gain valuable insights from your MySQL database.